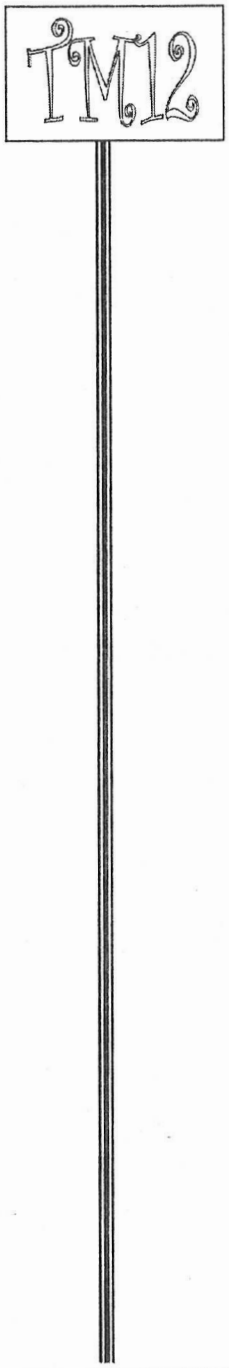


Understanding in the Library

Papers of the Treasure Mountain Research Retreat #12

October 5–6, 2005

Gilmary Retreat Center
Pittsburgh, PA

Edited by

David V. Loertscher

Entire book available from:

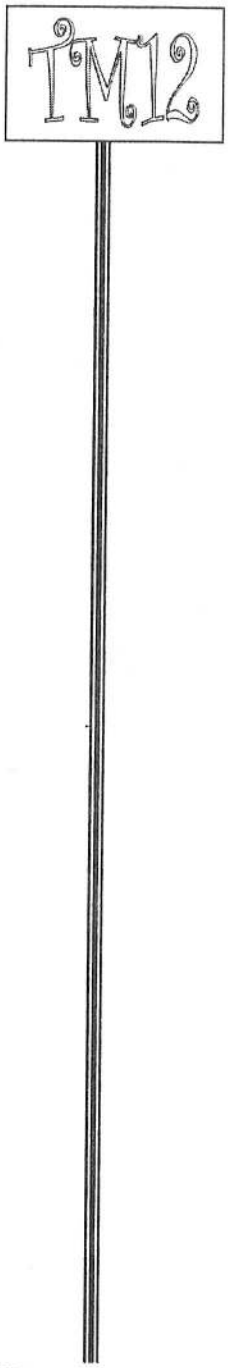
LMC Source
P.O. Box 131266
Spring, TX 77393
800-873-3043
Email: sales@lmcsource.com

Online at http://www.lmcsource.com

ISBN: 1-933170-16-6

Notice: Treasure Mountain 12 is supported in part by the Institute for Library and Information Literacy Education (www.illile.org), the Institute for Museum and Library Services (IMLS), and the U.S. Department of Education.

Table of Contents



Introduction

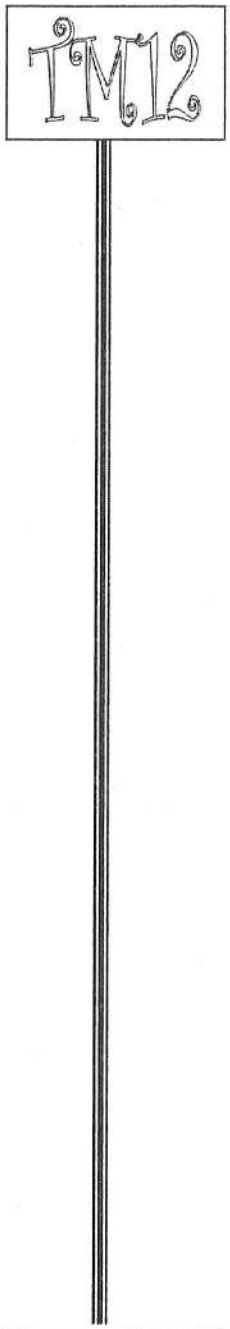
Questions for the Conference

As both researchers and practitioners of the school library media field gather to consider their relationship with the principles of Understanding by Design,[1] a few major questions are presented here for consideration and solution at the conference:

1. What is the real and actual potential for developing deep understanding of content and process learning in the library?
2. Is teaching and learning in an information-rich and technology-rich environment actually different than teaching in a textbook/lecture environment with a supplementary library?
3. When librarians take a collaborative role with teachers in the design of high-level learning experiences that promote thinking and understanding, what is the result?
4. How does the role of boosting deep understanding in the library compare to the role of other professionals such as technology specialists or instructional leaders already on the school staff?
5. How can the school library community link into the Understanding by Design movement? Into other parts of the educational community?
6. What kinds of research should we be doing in this area if we agree that it is an important role?

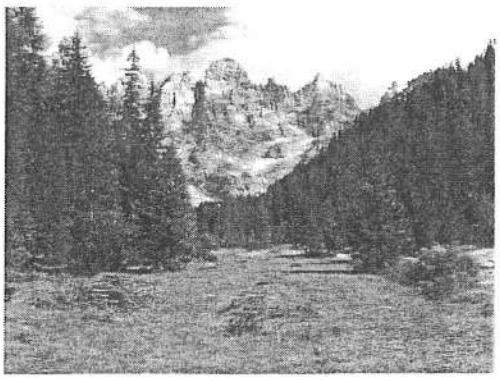
Other questions:

1. What are some interesting findings of current research in the field?
2. What are trends worth watching?
3. How can Treasure Mountain help?



Part 1

Foundational Elements of Understanding in the Library



Building Deep Understanding in the Library By Banning Bird Units and Replacing Them with High-Level Thinking Experiences

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School of Library and Information Science
San José State University

Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Introduction

The evolution of the school library from a support/supply center into a force for learning has been a goal of school library leaders for half a century. Frances Henne had such dreams for the field and wrote them into the 1960 standards for school library media programs. Looking back half a century, a collaborative role, a leadership role, and a force for achievement has been difficult for the bulk of our professionals. My own theory of the reasons for this situation lie in the fact that the warehouse duties of the librarian are so overwhelming and take so much time during a typical day, that our professionals do not take the time to collaborate.

We do have outstanding examples of librarians who have discovered the collaboration role, have a large enough staff to pursue that role, or just grit their teeth and put it as their highest priority no matter the crush of other duties. Obviously, enough of our professionals do some things right every day because their efforts show up in the Lance studies that link library media programs to achievement.

Two types of programs seem to be popular in the field today. The first are those professionals who emphasize reading as a foundational element of their library program. These professionals carry the torch of the "love of reading," leaving the skill of reading to be taught by the classroom teacher. Recently, more and more professional literature has been aimed at teaching librarians to become a part of the reading team and showing them how to integrate reading skills naturally into their literature programs. The other large segment of the field seems to concentrate on the teaching of information literacy skills as their central focus. This is largely the result of Michael Eisenberg's leadership in pushing information literacy to the consciousness of the field.

Two forms of information literacy instruction seem to predominate at the moment. The first is to teach information literacy skills as a course of instruction to be experienced by students in a systematic fashion at each grade level. Scope and sequence matrices have been published by many states and there are many professional guides that help the librarian build such a curriculum. This type of instruction is particularly popular in elementary schools where fixed library schedules predominate. Doug Johnson, a prolific writer and speaker in the field advocates this approach.

The second but less popular form of teaching information literacy is to teach library skills "just in time" as assignments or projects make their way through the library during the school year. Touted as superior by the majority of writers in the field, this type of teaching rests upon the foundation advantages of integrated teaching and practice of skills at the time when they are beneficial.

This paper advocates that a third wave of interest become center stage in library media programs as a means to integrate the previous two into a holistic program. We refer to collaboration as the star-studded element and the central element into which both reading and information literacy fold in quite nicely. This means that a traditionally weak program element would be thrust into prominence with its tentacles reaching into every classroom of the school and recognized as a prized contributor to achievement.

The problem with collaboration, however, is that our professionals to not seem to identify it the same way. Many count cooperation or support, or service as collaboration when the professional literature defines it quite differently. Many authors could be quoted to define collaboration as a librarian and a teacher jointly planning, executing, and evaluating a learning experience – a team teaching effort done together, taught together, and evaluated together.

But what is an exciting learning experience that is collaboratively implemented? Our contention is that in the past, too many learning experiences in the library were much too low-level resulting

in very little learning. We coined the phrase, "Ban Those Bird Units" referring to a process of replacing low-level learning experiences with much higher-level ones.

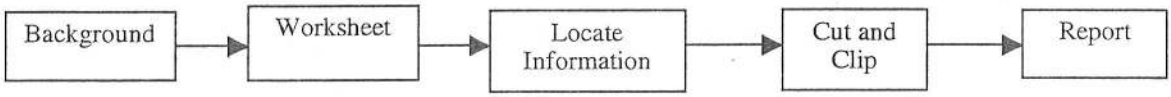
In the introduction to the book *Ban Those Bird Units: 15 Models for Teaching and Learning in Information-Rich and Technology-Rich Environments*, the focus is aimed at the teacher rather than the librarian. It explains in as clear a defense as the author could write what bird units are, and how to replace them with the help of the librarian to become exciting learning experiences.

We thought it proper to reprint that introduction here asking readers to test the clarity of its explanation and challenging them to do an even better job of communicating what the library can do to enhance teaching and learning. Here it is:

An Introduction to Bird Units

There are certain types of research assignments that contribute little or nothing to learning. Teachers should recognize such low-level activities and re-design to build achievement

What is a "bird" unit?



A bird unit usually follows this common pattern:

1. The teacher provides background to a topic in the classroom (could be birds, presidents, countries, states, people, etc.).
2. Textbook work is done.
3. The teacher asks the class to do a project in the library or computer lab and provides a worksheet for data collection. The worksheet contains fact questions.
4. Students pick a "bird" to research and go to the library or computer lab where the librarian or technology coordinator introduces them to a few resources.
5. Students copy information from information sources onto their papers.
6. Students report back to the class or turn the papers in for a grade.

Why is a "bird" unit generally a disaster?

When the majority of research in the library or computer lab is merely the cutting and clipping of information into some sort of report, little learning takes place. In the age of technology, students can easily cut and paste megabytes of information from the Internet or electronic sources and turn them in as a report. Obviously, time in the library or computer lab is underused and little progress toward educational achievement is made. In fact, assignments like these encourage plagiarism.

What is to be done?

1. Re-design the activities so learners must THINK ABOUT and analyze the information they collect in the library media center, thus increasing learning and achievement.
2. Re-design activities so that learners must DO SOMETHING (synthesize) with the information they collect (such as sense-making, performing, trying out, acting, building, etc).
3. Keep redesigning activities until number one and number two happen.

This book contains fifteen models to use, as the classroom and the library and/or computer laboratory are merged for a learning experience. Each model is designed to insure that students develop understanding and build knowledge. The design of each model requires students to not just cut and clip or extract information, but forces them to use that information in a higher-level thinking activity. The objective of the Model is preparing students to achieve and learn more in the real world of information and technology. The models do not ask you to abandon any successful teaching method, but suggest simple changes to elevate the learning experience dramatically. The models are based on experience and educational research and are designed to work in an information-rich environment pictured below.

Reflecting on transformed learning experiences:

As the collaborative team plans, transforms, or reinvents a learning experience into one of the models of the book, here are some reflective rubric-like statements to consider. The transformed unit:

1. Was true to the model or was a creative adaptation of it.
2. Caused students to use higher-level thinking resulting in deeper understanding. We are confident that the students learned more because of our new design.
3. Made use of QUALITY information resources and APPROPRIATE technology.
4. Integrated information literacy and technology skills into the learning experience.
5. Was a true collaboration of teachers, librarians, and technology professionals.
6. Was so successful that we plan to do it again, or we know how to tweak it to make it even better next time.

Introduction for Educational Leaders

Why such a crazy title? What are Bird Units? And why do you have something against birds?

For decades, school, public, and academic libraries have been plagued by "bird units." Bird units come in two different species: Fill-in-the-Blank Worksheet Birds, and Report/Term Paper Birds. So ubiquitous are these two species that they have crowded out every other kind of beneficial species and are as welcome as a New York City pigeon or a crow in a garden patch.

Permit us to illustrate.

> Story One:
>
> Teacher X is faced with teaching the "bird unit" for the tenth time in a decade of teaching. The bird unit topic could be Civil War, California Missions, old/famous/white dead men...etc., ad infinitum. The unit is to last from Monday until Friday. Days one and two are taken up with a brief introductory lecture, the reading of a textbook chapter, and having students answer the chapter questions.
>
> Wednesday. Time for a change of pace. Search the files. Find that sheet with all the purple writing on it (you have to be old to understand this joke). Take the worksheet to the copier and now you have a worksheet printed in black. Breeze past the library to inform the librarian of the impending invasion.
>
> March the class to the library. Give each student a worksheet. Say: "Pick a bird—any bird and answer the questions." Hopefully, the librarian has had time to pull the bird

books onto a cart for easy location. Students rifle through the books looking for "their bird" and the answers to their questions.

To young Susan's dismay, there isn't a whole book on the Rocky Mountain spotted woodpecker. She grumbles, adding to her tally that once again this library is a failure. Juan is disappointed because he did find a book on the ruby-throated hummingbird, but the answer to the first question was not on the first page, so he bops Susan on the head with the book and they both start fighting. Since teacher X has escaped the scene to the teacher's lounge, the librarian calms the troops and helps everyone find something to use.

The worksheet assignment is to locate a few facts, and we know them already:

What does my bird eat?
What color is my bird?
Where does my bird live?
Does this bird migrate? If yes, where?
Etc.

Forty-five minutes later, the teacher re-appears, gathers the chicks, and for the next two days, students do reports in the classroom on their birds.

The last activity on Friday is the test, assessing what students learned from the lecture and the textbook but nothing from the "library" activity. The library activity was a goose egg—the tenth goose egg in fact. It has been a test of whether a student can find a fact and then copy it from one place to another: a first lesson in plagiarism.

Story Two:

Teacher Y usually spends three weeks on bird ecosystems. The first two weeks are filled with textbook/lecture activities. On Friday of the second week, the teacher announces that the next week will be used to do a library research paper. It has been difficult to get the class scheduled every day in the library for a week, but our teacher has planned ahead and gotten on the calendar.

On Monday, the assignment is given. "Pick a topic having to do with birds you are interested in and write a six-page report." During the research time in the library, the teacher has the librarian conduct the class but is available for questions while grading papers in the corner.

Andrew, one of the students in the class, has had this kind of assignment before and knows exactly what to do so that he can spend most of his library time flirting with Theressa, his latest flame. He seats himself at a library computer and finds that the Internet is down. No worry, he will connect from home on Thursday night to download a paper from his favorite "term paper site" and turn it in Friday morning. No use sweating this one out, particularly since he has two other papers due the same day and every night is taken up with his part-time job. Andrew doesn't know much about birds, but he knows a lot about searching the Internet (using it to cheat) and succeeding with girls.

Story Three:

Teacher Z has been feeling the pressure of both the state standards and the standardized testing and is trying to find a way to cover more material in the same amount of time. Needing more time to focus student attention on what will be tested, the library bird units of the past are cancelled, in favor of parsing sentences.

Our three scenarios are stereotypical but all too common. As a reader, you probably have lived through something similar when you were a student. Perhaps you have taught a bird unit at one time or another.

We propose the banning of goose egg—non-helpful—bird units as low-level learning experiences. They are counter-productive in today's emphasis on achievement and boring, boring, boring to students. To cut out the library experience, however, is no solution at all.

P.S. We have nothing against birds!

What do you mean by "Information-rich and technology-rich environments?"

Permit us a bit of background.

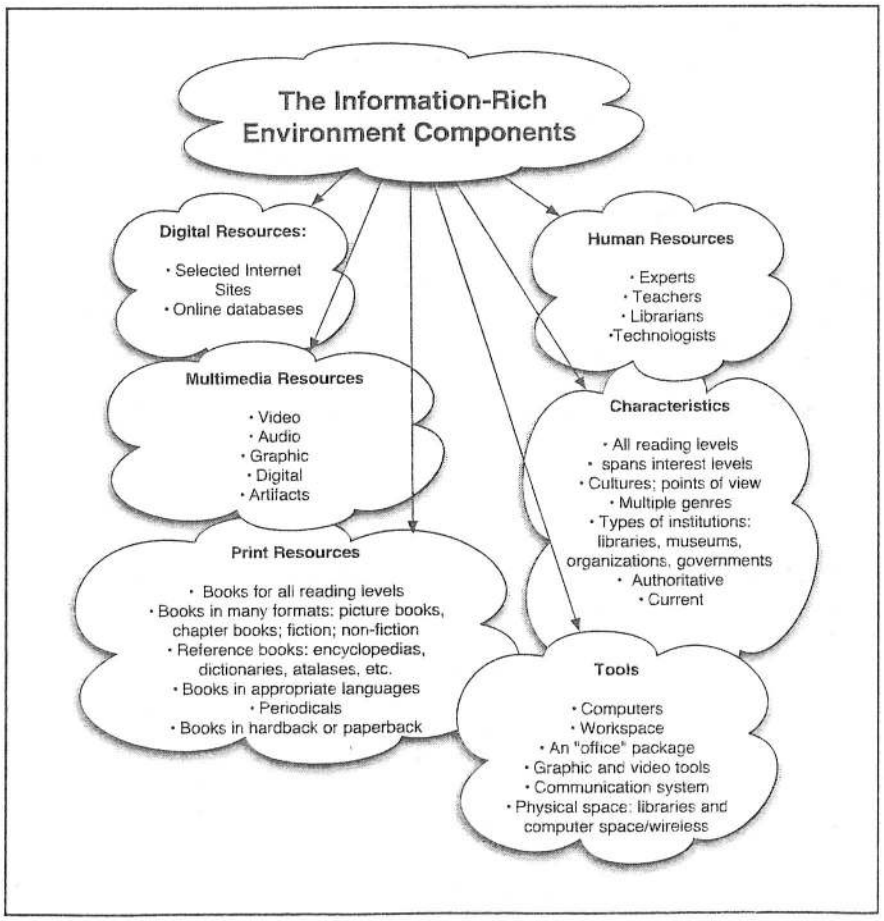
> **Start with a teacher.** Millions of children in the world today have very limited information systems to educate them. They have the wisdom and learning of their parents and their communities, but have only a teacher for more formal education: no fancy facilities, no books, no blackboards, no computers, no desks. To these students, the sum total of information is in the head of their teacher. As a result, rote learning is the primary activity of the school day.
>
> **Add a textbook.** Millions of other children draw not only upon their culture and their teacher, but have the advantage of a textbook as an added information system. Textbooks have been wonderful inventions because they combine the expertise of many subject specialists coalesced through the eyes of a textbook author into a very versatile data storage mechanism. These information packages are very convenient and available for use both in and out of school, depending on the circumstances and affluence of the school.
>
> The problem with the textbook culture as an information system is now becoming a major challenge. The textbooks of today
>
> - Are often bloated, as the amount of knowledge in many disciplines explodes.
> - In addition to core knowledge, all kinds of exercises, side bars, supplementary materials (at additional cost) and every other imaginable resource that a teacher might use, including digital resources available on line.
> - Often cost in excess of $100 per copy and weigh so much that parents demand a copy at school and one at home.
> - Can only be read by a percentage of the students in the classroom because of low reading level or language problems.
> - Are not challenging enough for other students
> - Become outdated because of replacement costs
> - Often do not correlate well with state standards and state tests.
>
> In the introduction of a recent college textbook, the editor said something to this effect: "All you need to know is in this book and its online supplement of thousands of digitized articles. No need to use the library." An attractive promise indeed. Since the conglomerate publishing company owns many periodicals, publishes many prominent author's works on the topic, and has the capability to deliver its products in any form and at any time, it seems logical to package a total information environment at the highest price the market will bear. From one vantage point, if standards, testing, and the textbook are controlled, then we only have to require teachers to be accountable for the prescribed material. "Here is what to teach. And, here is the schedule of the page you should be teaching from each day of the school year."

Given the problems with the textbook, many have asked: "Isn't there another solution?" While total packaging and regimentation is possible and workable in some countries, it hardly fits the model of a creative and innovative society. We believe that all students would thrive in the next stage of a rich information environment.

Turn on the information-rich and technology-rich environment. In the eighteenth century, Dennis Diderot felt that the universe contained a finite amount of knowledge and that almost all of what could be known was known. Thus, he created an *Encyclopèdie*, feeling that all knowledge could be captured and summarized in a single set of volumes. In the late 19th century, Melville Dewey also felt that his classification system would go through only a few editions before it could classify the sum total of all knowledge. The Dewey Decimal System is now in its 22nd edition and is being revised regularly to keep up with the expanding knowledge of the world.

With the introduction of the microcomputer and the Internet in the last decade of the 20th century, the world of information has changed dramatically. Suddenly the information pool has deepened to an ocean, and access through technology is ubiquitous. Schools are making progress toward wireless access—even Starbucks has hot spots. In such an information environment, everything changes, or at least needs to.

What is an information-rich environment?
The illustration here details the components of information-rich and technology-rich environments, as we know them today. This evolves, of course, as various technologies and delivery systems evolve.



What do we know about the Internet in its decade of major expansion?

- It has billions of sites and may crash under its own glut.
- Contains anything anyone wants to put up including pornography, advertising, chat spots of nefarious characters, and information from any kook who cares to post.
- Allows organizations of all types to post their official information or misinformation.
- Has become a powerful political tool around the world
- Contains more misinformation than accurate data.
- Is becoming outdated as sites are not kept up.
- Is becoming less and less "free" as authors try to recoup their costs of creation and maintenance.
- Is so overloaded with noise from unwanted email and other propaganda that its burden on the individual is almost unbearable.

More importantly, what DOESN'T the Internet contain?

- Almost all copyrighted materials, because authors expect to be paid for their work.
- Almost all fiction and nonfiction books published in the last 75 years—in other words, everything you'd expect to find in a Barnes and Noble.
- Virtually all children's literature published in the last 75 years
- Full-text articles in most magazines and newspapers.

However, FOR A FEE, one can access through the invisible Internet:

- Full-text magazine articles and newspapers, some extending back into the 1980s.
- Current audio books.
- Current music.
- Major databases critical for students and teachers.
- More and more digitized e-books (current copyrighted books usually in PDF format).
- Thousands of term papers and reports ready to download and turn in to a teacher.

And you thought the Internet was free. Well, there's Shakespeare, along with many of the other classics. And there's plenty of stuff at least a century old. But if you want current research, it's going to cost precious shekels.

Yes, I know we are in an information-rich and technology-rich environment, but what is your point?

The point is, in the last twenty years, teaching in a sparse information environment or in a textbook/lecture culture has become antiquated. The real world, and the world our students will live in for the foreseeable future, is a very information-rich and technology-rich world of information. Continuing to teach in an outmoded information space is to continue to use horse and buggy technology in the space age.

The following chart contrasts both poor and rich information environments.

Tightly Controlled and Smaller Information Environment	An Information-Rich and Technology-Rich Information Environment
Advantages: • Everyone on the same page at the same time. • Easy to tally "what has been covered."	Advantages: • Information and technology for each learner at their skill level/language level. • Interest level easier to satisfy. • Variety in itself a motivator. • Simulates the real world of work and life in general. • Can stimulate all learning styles.
Disadvantages: • Learners not on the level of the textbook/lecture/assign-ments. • Satisfies only one learning style.	Disadvantages: • May get out of control. • Usually takes more time if not planned well.

Our second point is that few curriculum leaders, policymakers, school administrators, and teachers have taken any notice. True, we have spent billions on hooking kids up the Internet and turning it on, but we have paid less attention to what's on the wires than the wires themselves.

What do you mean, "education has not taken notice?"

Consider our observations and challenge them if you can:

- National standards for the various curricular areas—such as social studies, science, or math—may refer to the need for computers but either ignore the issue or assume that a high quality information system will be provided.
- Programs at national professional educational associations rarely have sessions addressing how to teach or learn in the new information-rich environments. There are often sessions on how to use a piece of technology in teaching as a useful tool in information access, but rarely on what to do after the button has been pushed and the result is 7,254 web sites available on your topic.
- Few major authors in educational pedagogy take note that the world of information has changed. For example, a major book[1] on building background knowledge never recognized the new information world.
- Major movements, such as Understanding by Design,[2] have great pedagogical ideas. However, we must apply those ideas to the information-rich world where they would flourish.

To educators in information professions, the dismissal of the new world of information has been mystifying on one hand and saddening on another. It is as if the world changed but no one noticed.

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[1] *Building Background Knowledge for Academic Achievement: Research on What Works in Schools*. Robert J. Marzano.

[2] Fill in

Yes, but isn't the movement into this new information and technology environment implied by all the major educational thinkers?

Perhaps. But we are unconvinced that the main players really have considered the major shift in information and really have taken it seriously. We rarely see instructional models that help teachers and students live and work in anything other than a textbook environment or a contained classroom with perhaps a single connection to the Internet or a couple of hundred books in the classroom library. Do a survey yourself. Check any of your popular books in education and look in the index for words like *information, information literature, information skills, library, librarian, databases, Internet,* or any techniques that work only in high quality information environments.

So What?

There is a presumption that there is a library in the school with rich resources; that there are databases and high quality Internet sites selected for student use; and that these resources are available anywhere and at any time. In today's frantic funding scene, anything taken for granted is likely to disappear. Many school libraries have a very small budget and have not kept up in technology. Often, if a professional retires or moves, a clerk replaces the professional, as if a person with little educational background could build the kind of information system students and teachers desperately need.

Yes, there are stereotypical librarians who protect their ancient books and act like a dictator in their space. Yes, there are tech directors who act like demigods keeping everyone off their networks lest they crash. Those folks need to change or leave. Our point is that without competent professionals who are teachers in both libraries and tech centers, teachers and kids will suffer. In other words, we ignore libraries and tech centers at our own peril. Teachers and administrators who have experienced super school libraries and technology programs have experienced the great lift that quality programs have – non only on the collaborative design of teaching, but the impact these programs have on student learning. It is not surprising that quality school library media programs keep turning up in research studies as making a difference in academic achievement.[3] For those who have not experienced these types of programs, search out and visit several to discover why they make the difference they claim. It's the same everywhere in education. It's people who make the difference.

Again, what's your point?

The premise of this book is that there are three teaching environments, which are all very different:

1. Teaching when there is nothing other than the teacher's knowledge;
2. Teaching in a textbook/lecture world;
3. Teaching in an information-rich and technology-rich environment.

The design of a learning experience and what works in each of the three environments is quite different. Our point is that all pedagogy must be redesigned or reinvented to work as the information and technology environment evolves. This will take good librarians and technology

[3] Since 1993, at least fifteen state studies have been conducted identifying quality school library media programs as one component contributing to academic achievement. Many of the studies have been conducted by Ketih Curry Lance in states such as Colorado, Minnesota, Iowa, Illinois, Pennsylvania, Alaska, etc. For a complete list of the studies and their findings, visit http://www.davidvl.org and look for the research link. Or visit the Colorado State Library web site for an additional bibliography of research studies on the impact of school libraries.

specialists to get the job done. Take the case of differentiation of instruction, a concept that is very popular. How can a teacher hope to meet the needs of every child in the classroom when only a few can understand the textbook? Do we assume the teacher is resourceful enough to compensate for a failing information system? Are we forced back into the teaching-by-rote era? Do we assume that the lecture will compensate for the tough textbook? Do we assume that children who are just learning English will understand the lecture? Do we just say to the teacher, "Speak more slowly and loudly and they will understand?" We hardly think any of those suggestions are realistic in a world expecting every child to succeed.

So what do you propose?

First, lets get a few things straight.

- A well-prepared lecture is hard to beat as a teaching technique, although a certain percentage of the students will either ignore it, not understand it, misinterpret it, or try to copy it all down since they expect to be tested on it.
- Textbooks and their supplemental materials are often useful outlines of what should be known and help teachers to structure learning over time. However, they are bloated, too expensive, and usually written for a different audience than "my class."
- Teaching in an information-rich and technology-rich environment is quite different than the textbook/lecture strategy, BUT IT IS THE ONLY HOPE IF ALL STUDENTS ARE GOING TO BE GIVEN AN EQUAL SHAKE.

We propose that each of the three major information environments be recognized by the major instructional designers in education and that teachers be trained to operate in each of these different worlds. Teachers should be taught to recognize the shift in information and technology environments and gain a repertoire of teaching and learning strategies that work best in each. This is no different than the flexibility we expect teachers to master as they confront different learning styles, different student sophistication levels, and the myriad rules and regulations for handling all types of students in an educational organization. It is another dimension to their flexibility, but it is an important one.

But isn't an information-rich and technology-rich environment expensive?

Yes. But compared to the expenditures every year on textbooks, it is very reasonable. Currently, spending for library materials and databases around the U.S. average around $20 per student per year with states like California averaging about $1.00 and others spending upwards of $30.00 Expenditures on technology hardware vary widely from state to state and district to district. Initially, spending for technology was substantial, but as time has passed and budgets have shrunk, many districts have cut back dramatically. It is certain that many administrators often budget for hardware and educational software, but skimp on the information to go on the wires. Thus, librarians and technology specialists struggle to provide as much quality information as they can with limited funds.

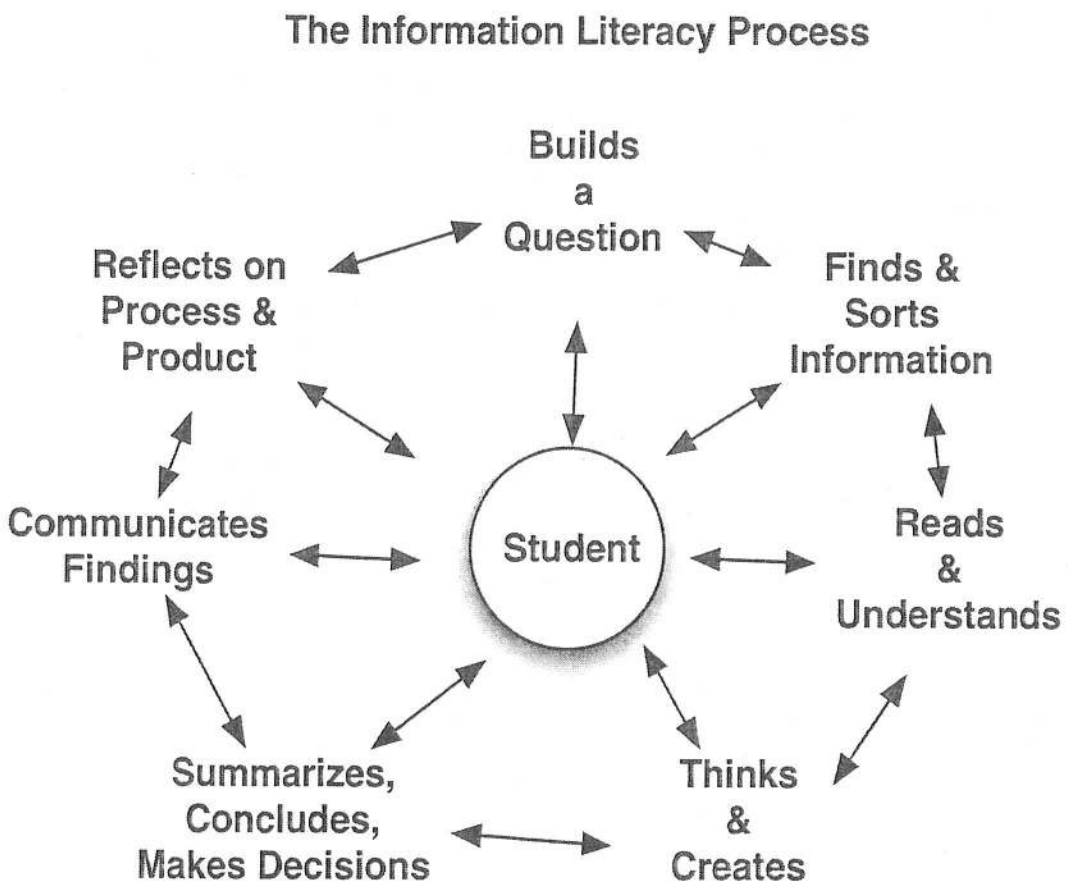
Quality collections of materials can be maintained under $25 a year per student. What a bargain! For the price of a single hardback book in a typical bookstore, students are beginning to taste a quality information system. We often give librarians the guideline that one book a year per student will maintain a collection, but the price of two books per year will be needed to keep collections of print, multimedia, and digital collections fresh. If we were to provide equitable spending for textbooks and the information system we are describing, spending for library budgets would have to quadruple in most districts and be increased a hundred fold in a state like California (more about this when we discuss our vision of the future).

More and more information—particularly databases and online periodicals—require schools to treat information as a utility. That is, if the bill is not paid, access to the database is cut off. School districts are going to have to learn that paying the information bill is akin to paying the electric bill. No power, no school. No information, no school. To turn off both is to retreat quickly into the 19th century—hardly a place where we'd like our 21st century children, who are supposed to be the best and brightest in the world, to be educated.

But even if we fund the information-rich environment, aren't kids lost in such a vast space?

Admittedly, students can surf, fiddle, and waste a great deal of time paddling around in information space so that in a normal hour of research they would not really get anything done except wandering.

The librarians of the nation have come up with a model to help students and teachers navigate a broad information space. Their strategy is to teach information literature and advocate that students who use the real world of information should be information literate. Information literacy is defined not only as finding information, but also as evaluating it very carefully before using it to build knowledge or do a task. Whereas librarians traditionally concentrated on helping patrons find information, their task has now switched to helping patrons judge, analyze, and use information.



We can all probably remember the days when we were doing research in the library and used the *Reader's Guide to Periodical Literature* to help us find magazines. We would laboriously copy out 20 citations, take them to the magazine room, and hope to find at least one that we could cite. Today, we type in a search term and are overwhelmed with information on our topic. It requires information literature skills to know what to use and whether it is worth using at all.

Librarians often teach the research process adapted from the scientific method. Below is a generic model of the process librarians teach as students confront a problem in an information-rich environment.

If you ask any librarian about information literacy and what they are trying to accomplish above and beyond the old library skills (of learning the Dewey Decimal System and reading catalog cards), expect an earful.

Enough of that! What are the 15 models for teaching and learning that are spoken about in the title of the book?

We created 15 models to teach and learn when information abounds based on our long experience with learners and study of many research reports spanning education, library science, and technology.

We divided these models into three categories:

1. Appetizers
2. The Main Course
3. Dessert

Appetizers are fairly simple models and can be used easily within many other teaching strategies. The main course models might be the entire structure of a total learning experience. Dessert challenges the teacher to use all the models creatively as the occasion presents itself.

The models do not work well in an information-poor environment but are structured in such a way that students will have lots of choices in information, multimedia, and human resources.

Here are our assumptions about the models as a whole:

- The models do not ask teachers to discard any effective teaching technique that already works.

- Each model requires the student not just to cut, clip, or extract information from a wide variety of sources, but to use higher-level thinking strategies to accomplish the learning objective.

- The models demand that information and technology gurus (often known as librarians and technology specialists) collaborate with the teacher in designing learning.

- The models require every "bird unit" to be redesigned. Redesign is often a simple but very important tweak.

- The models require every school give more than lip service to the creation of a high-quality information system usually known as the library—but a library of very different proportions to the old one that stored a few tattered volumes and was visited once a week for a story and a "library lesson." Such new libraries cost a substantial amount of money and not only have print materials, but also have the digital school library system that is

available 24 hours a day, seven days a week from anywhere in the world a student happens to be.

- The models assume that the librarian and/or the technology specialist do more than just keep the wires or sort the books. They are either willing to participate in designing quality learning experiences, or their jobs are shifted to another spot in education.

- Not all learning experiences need to take place in an information-rich environment. It is quite appropriate to rely totally on a teacher's experience or totally on a textbook/lecture format at times, but never as a steady diet. Variety is the spice of education and will likely lift boredom and increase motivation as expectations for learning are raised.

- Just because the information environment expands, the time for teaching a topic need not expand. It may, as students get immersed in a fascinating learning experience, but not always.

- None of the models are mandated in their exact form. Rather, they should be used with other creative ideas and judged on their impact on the amount learned in the time available.

- None of the models cast the total burden for teaching on a single individual, but presume that both the teacher and partner specialists be in the saddle to cut the teacher/pupil ratio at least in half. The notion is that two heads are better than one. All models presume collaborative planning, team teaching and joint assessment of the learning.

Perhaps a few examples would help here.

As you scan the list of models below and read the tweaks suggested, you might catch a brief glimpse of what we are talking about. Expanded examples accompanying each of the models in the main section will flesh out these ideas.

Examples of Higher Level Bird Units

Model	Sample approaches for information-rich environments
	Appetizers
1.Background to Question Model	Birding with digital cameras. Examine feathers under a microscope. Visit a bird sanctuary, museum, or art gallery.
2.Sensemaking Model	Research migration and create visual maps, charts, or graphs. Discover things that birds can do that are replicated in technology, and create a visual display (e.g. beaks-nutcracker or straw, claws-hooks or vice grip).
3. Read, View, Listen Model	Explore books, videos, or websites to discover: What are birds used for? What uses are harmful? What do legends and myths tell us about birds in different cultures? Read stories having a wise old owl character and discover the common characteristics.
4. Advice to Action Model	Consult expert advice on how to attract birds to the schoolyard and your own backyard.
5. Compare & Contrast Model	Research and compare: swamp birds and desert birds, nocturnal birds and diurnal birds, woodpeckers and hummingbirds, two birds with webbed feet such as a Canada goose and a puffin..., the structure and function of wings of birds and airplanes, or pigeons around the world.
	The Main Course
6. Concept Jigsaw Model	How has art been influenced by birds? Examine painting, sculpture, plays, ballet, music, movies, or poetry.
7. Problems/ Possibilities Jigsaw Puzzle Model	Which birds are threatened or endangered? How can we protect them?
8. Matrix Model	Are all oviparous animals birds?
9. Timeline Model	Explore the evolution of birds. Document the history of ornithology. Hatch eggs in the classroom and document the process. Show location of a migratory bird, such as a hummingbird, during the period of a year.
10. History & Mystery Model	'Winged Man" How were early flying machines influenced by birds?
11. Take a Position Model	Do we need an international agreement to conserve and manage bird populations?
12. Recreate Model	Role-play waterfowl migrating from their nesting habitat in the far North to their wintering grounds in the South.
13. Re-invent a Better Way Model	Build a birdhouse or birdbath, paper airplane, or a peanut birdfeeder that squirrels can't eat from.
14. The Quest	Do a major study of birds whether in the form of an I-Search Paper, a formal research paper, a major WebQuest, or other sizeable research project.
	Dessert
15. Mix It Up	Combine any of the models above creatively

What are the techniques that would help teachers the most in applying these models?

In many instances, the tweaks applied to create higher-level learning experiences are not just the groupings or structure of the model but the ability to ask good questions. A good question will be interesting and relevant to the students and will sustain that interest or curiosity throughout the learning experience. This is critical, since all the models will require the students to think harder and do more work than they would during a passive unit. A good question will not be able to be answered by cutting and clippings answers from an information source. A student will not be able to find their work already done for them from some website or reference book. The question will cause them to combine various information sources, think about the information, and build a fresh perspective, idea, or reject everything they have encountered and be truly creative. For ideas on how to build better questions consult Jamie McKenzie's work at http://www.fno.org/sept96/questions.html

A second technique that will boost the likelihood of success is the teaching of group dynamics during the unit. All the 15 models can begin with individuals, but invariably end up in some kind of grouping as information is pooled, analyzed, and synthesized. Since teams or groups are so common in our workforce in laboratories, commercial enterprises, or many organizational structures, teaching group skills is a life skill that may as well be mastered early.

But are the models based on research?

It is true that the development of the models rests squarely on a body of professional experience. The authors have a combined experience of over 75 years in the United States and Canada. Together they have worked with teachers at all grade levels and in all disciplines; they have worked with librarians and technology directors across the continent; and they have spoken to educators at professional conferences and workshops in every province of Canada and in almost every state of the U.S.

But beyond that experience comes the support of research studies across the field of education. One of the authors conducted an extensive review of the literature of information literacy across the world[4]. All the models are based in research reviews done by Robert J. Marzano,[5] and others in the Understanding by Design movement.[6] We have also used reviews of research in technology[7] and reviews of reading research done by Krashen and McQuillan.[8] The work here has been affected by much of the literature in higher-level thinking, creativity, and the work in inquiry and constructivist education.[9] This is true because the best ideas in education today link into an information-rich environment.

Much of the skills-based approach to education is not a part of our foundation because the best of those techniques work better in a predominantly closed information system. We don't see that the practice of math facts—whether in the dirt with a stick, on the chalkboard, using a set of flash cards, or being presented with problems on the computer—is any different. The information space is equally narrow and appropriate for drill and practice. It makes little difference whether

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[4] Loertscher, David V. and Blanche Woolls. *Information Literacy: a Review of the Research*. 2nd ed. Hi Willow Research & Publishing, 2002.

[5] Our favorite works of Robert Marzano include his *What Works Series* published by ASCD. Individual titles are listed in the resources section at the end of this book.

[6] Wiggins & McTigue. Understanding By Design. ASCD, 1999. And Understanding By Design Handbook. ASCD, 2004.

[7] Center for Applied Research in Educational Technology (CARET) at: http://caret.iste.org/

[8] Krashen, Stephen. *The Power of Reading*. 2nd ed. Libraries Unlimited, 2004.

[9] See our list of favorite titles in the resources section at the end of the book.

early learning of the piano is done on a $20,000 Steinway grand piano or on a $30 electronic keyboard. Thus, we have not been impressed with the body of technology research that has tried to compare learning the same facts, operations, or ideas via computer, written text, oral lecture, or any other comparative medium. Those studies have generally come out with "no significant differences" and we have not been surprised. It is not so important that technology delivers the same information that is in a book or a magazine; it is the fact that technology can deliver information in a myriad of different ways, in different sophistication levels, in varying genres, and with differentiation as its key strength. We do admire the efforts of a number of national organizations to promote technology in ways that truly enhance learning.[10]

If you authors had your wish, what would a likely scenario be for education in an information-rich and technology-rich environment?

Since you asked, here is a picture of a restructured school that we think would work.

1. Start with an information ticket. For every day a student is in school, the federal government would supply a $5.00 information ticket. Thus, if a student moved from school to school, the current school would claim the money. If a child were home schooled, a public library or a school that agreed to provide the information support might claim the ticket. In no case would a single commercial entity be allowed to claim the information ticket (although they would be happy to do so).
    a. A $5.00 bill per day would pay for the following information services:
        i. $2.00 - All textbooks and accompanying consumables selected locally.
        ii. $1.00 - A library, both print and digital, including online databases, groups of carefully selected web sites, and multimedia selected locally. The digital portion would be available 24/7 and from any location worldwide.
        iii. $2.00 - A connection device (perhaps a cross between a PDA and a notebook computer and one that would last two years and then exchanged for an upgraded model).

    The ticket would not pay for additional equipment, the wireless network system itself, or the salaries of the persons administering the system. In other words, like a utility such as gas or electric, the information system would be a basic component of the education system rather than an add-on as at present. Benevolent funding has never worked and never will.

2. Create an educational pod of four teachers and their normal quota of students. This group of four would have the following structure
    a. A knowledge team leader qualified as an information/technology/ curriculum/instructional designer
    b. Three regularly-credentialed teachers

Such a team could be generalists, as elementary teachers are, and would have the same children for several years. Or, the team could be four specialists such as social studies, science, math, or fine arts, and students would rotate among the various pods of specialists.

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[10] Our favorites include: the Partnership for 21st Century Skills at http://21stcenturyskills.org/; The George Lucas Educational Foundation (GLEF) that publishes Edutopia at http://www.glef.org/; The various standards documents published by the International Society for Technology in Education (ISTE) at http://www.iste.org/ and the enGauge 21st Century Skills project at http://www.ncrel.org/engauge/skills/skills.htm

The focus would be on the knowledge team leader who would spend approximately half the day in planning and assessment and half the day teaming with one or the entire group on educational units.

The knowledge team leader would have the following qualifications and training:

a. Credentials as a master teacher before being allowed to apply for the job.
b. Advanced coursework in instructional and curriculum design.
c. Competence in information—selection, acquisition, use, and the teaching of information literacy from library and information science.
d. Expertise in the use of technology as an educational tool
e. Management and leadership competencies.

In Summary

We can't help but agree with the Committee on Developments in the Science of Learning in their expanded edition of *How People Learn*:[11]

> More than ever, the sheer magnitude of human knowledge renders its coverage by education as an impossibility; rather, the goal of education is better conceived as helping students develop the intellectual tools and learning strategies needed to acquire the knowledge that allows people to think productively about history, science and technology, social phenomena, mathematics and the arts. Fundamental understanding about subjects including how to frame and ask meaningful questions about various subject areas, contributes to individuals' more basic understanding of basic principles learning that can assist them in becoming self-sustaining life-long learners (p.5).

We believe that the models in this book provide effective strategies for teaching and learning in an information-rich environment rather than being crushed by information overload. Feedback to the authors is appreciated and can be addressed to David V. Loertscher at davidl@slis.sjsu.edu

A Few Notes for Librarians

Rivaling the "heartbreak of psoriasis" is the amassing of books, digital information, and multimedia and then having few customers. For half a century, school librarians have begged, cajoled, and smooth-talked monies to build resources for teaching and learning. And national standards have placed collaborative teaching and learning as a top priority in boosting achievement. The potential to contribute to teaching and learning has never been greater.

As the authors travel about North America, the number one complaint we hear from school librarians is that teachers are either unwilling or too busy to collaborate. And when they do, the "bird unit" ideas predominate. Our message in a world interested only in the bottom line of scores has been that the time has come to "strut our stuff."

Teaching and learning in an information-rich and technology-rich environment holds a great deal of promise because this environment is the real world of the 21st century. Armed with that knowledge, the authors have created models to replace the annoying and low-level library activities that are all too commonplace across the continent.

It is one thing to ban bird units from the library; it is quite another to have exciting alternatives that truly boost understanding and achievement. Teachers often avoid libraries because of time

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[11] *How People Learn: Brain, Mind, Experience, and School.* Expanded Edition. National Academic Press, 2004 Created by the Committee on Developments in the Science of Learning, Commission on Behavioral and Social Sciences and Education, National Research Council.

constraints, but they also fear that time spent doing research or encountering anything except what is tested will negatively affect scores. Furthermore, many librarians find that the time they have to collaborate is being cut as clerical help diminishes or as jobs are cut from full to part time.

The concern of administrators to economize by eliminating professional librarians but keeping the library open through clericals or volunteers presumes that access alone makes the difference. "If we just keep the computers plugged in, the books on the shelf, and the door open, it is sufficient." If this reasoning were used for the management of the principal's office or the classroom, where would the school be? The professionals in the library play as significant a role as principals and teachers.

The authors are often asked which is better: "to have a teacher bring a class to the library doing low-level learning activities or not come at all?" We recommend the latter as shocking as that may seem. Our advice to every librarian is to link arms with principals and forward-thinking teachers in a resolve to maximize the contribution that the library makes to achievement. There is no time to allow nonsense or vacation time in the library. Librarians cannot claim a contribution to teaching and learning unless literacy and understanding are being built day in and day out.

The models presented in this book are, in reality, tweaks to good teaching practices. Their message is not that everything done previously is wrong and that our models are the only right way. Rather, they are that little extra boost that can push a learning activity to successful completion—to win the race, not merely participate in it. Experience with the models indicates that librarians go through two stages: first, the slavish application of a particular model to build repertoire. Second, librarians become creative at combining parts of models as they watch and gauge student learning, motivation, and excitement for the library.

It is impossible to improve or fine-tune "the dreaded worksheet" exercise. Copying facts from one location to another and passing them in or merely regurgitating them is counterproductive no matter how it is framed or implemented. It matters not whether the fact has been copied with a pencil or cut and pasted by computer. It is all the same nonsense.

For doubters, we recommend viewing the video "We are Information Literate!" available from LMC Source at http://www.lmcsource.com. When first graders experience high-level learning experiences and then are interviewed as fifth graders, what differences can a single learning experience replicated at each grade level make? As authors, we are convinced that given whatever time the librarian has to collaborate, it is more important to do a few model learning experiences than many mediocre ones.

Because excellence is its own reward, the challenge of experimenting, creating, honing, tweaking, and elevating learning experiences in libraries is worth accepting. And, it's all part of earning our keep and perhaps an extreme makeover of what libraries contribute to learning.[12]

[12] See: Loertscher, David V. "Extreme Makeover." *School Library Journal*, November, 2004.

Background to Question Model

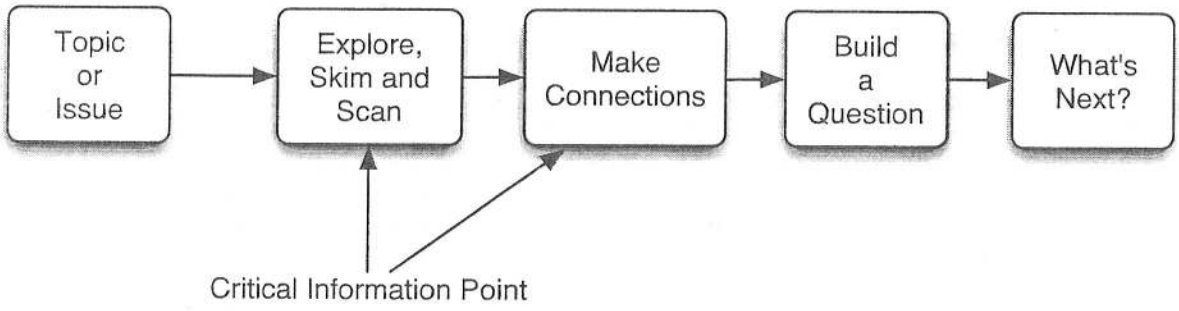
Curriculum Topic and Objectives

Background Building Activity
- Read
- View
- Listen
- Survey
- More is better

Connect New and Old Learning

Build a Question
- Narrow and focus a topic
- Build a quest

Plan a Project
- Goals
- Timeline
- Resources
- Strategies



Why This Model?

- Compensate for uneven prior knowledge
- Use when prior knowledge is skimpy
- Help learners build engaging questions when they seem to lack interest
- Provide an opportunity for a "topic to select a learner"
- Use when the textbook is insufficient
- Help learners narrow a topic when struggling with generalities
- Turn a library orientation into an exploration

Possible Topics:

- Environmental issues
- Genetics
- Health and safety issues
- Political ideologies
- Types of music
- Science fair projects
- Pet care and needs
- Media influence on behavior
- Marine biology
- Rain forests
- Middle Ages
- Middle East
- Early settlers
- Ecosystems

Critical Information Literacy Skills*

- Explore a Topic, K&Z, p. 4
- Search Strategies, K&Z p. 24
- Locate Resources, K&Z p 26
- Select Relevant Data, K&Z p. 62
- Skim, Scan, Consider, K&Z, p. 32
- Make Connections, K&Z p. 116
- Reflect, Transfer, Apply, K&Z p. 166
- Develop Questions, K&Z p. 12
- Define a Research Topic, K&Z p. 8

* Koechlin, Carol and Sandi Zwaan. *Build Your Own Information Literate School.* Hi Willow, 2003

Sensemaking Model
Visualizing / Re-Conceptualizing

Concepts, ideas, or data either not understood or misunderstood

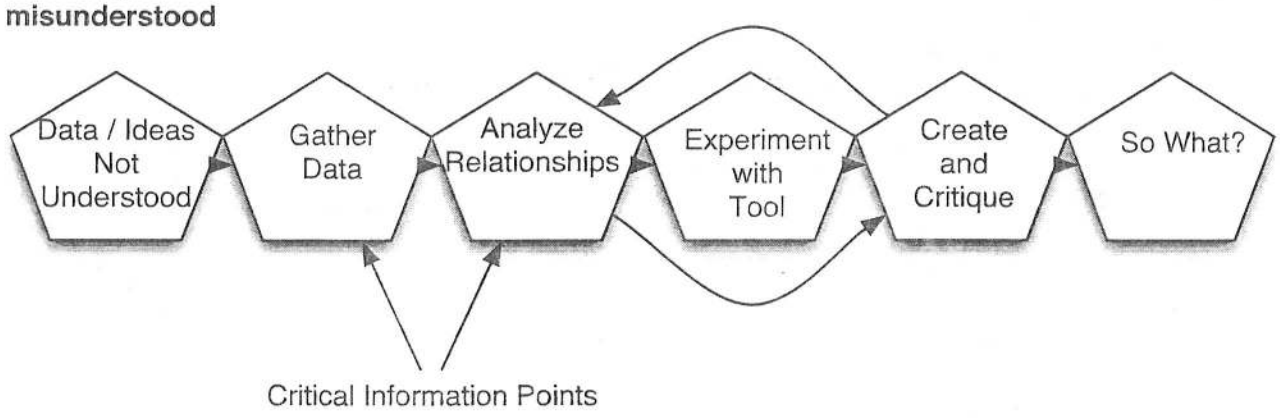
Collect & validate data

Find Connections:
- Sort
- Classify
- Patterns
- Missing Data?

Use Graphic Tools to Assist In Visualization

Create
- Re-Work
- Re-Think

Share and Defend New Understanding



Why Use This Model?

- Take advantage of the addage that a picture is worth a thousand words
- Take advantage of learners who have high visualization abilities
- Add one more dimension to text and explanations
- Use when data cannot be understood in their raw form
- Try several visualizations of the same ideas
- Particularly useful for concepts where misconceptions abound

Possible Topics:

- Popular misconceptions
- Data in any discipline
- Large amounts of data
- Population patterns
- All types of maps
- Ideas and their connections
- Cause / Effect
- Environmental / social issues
- Difficult concepts

Critical Information Literacy Skills*

- Evaluate Resources, K&Z p.34
- Use Organizers, K&Z p. 90
- Sort, K&Z p. 94
- Compare, K&Z p. 98
- Classify, K&Z p. 102

* Koechlin, Carol and Sandi Zwaan. *Build Your Own Information Literate School.* Hi Willow, 2003.

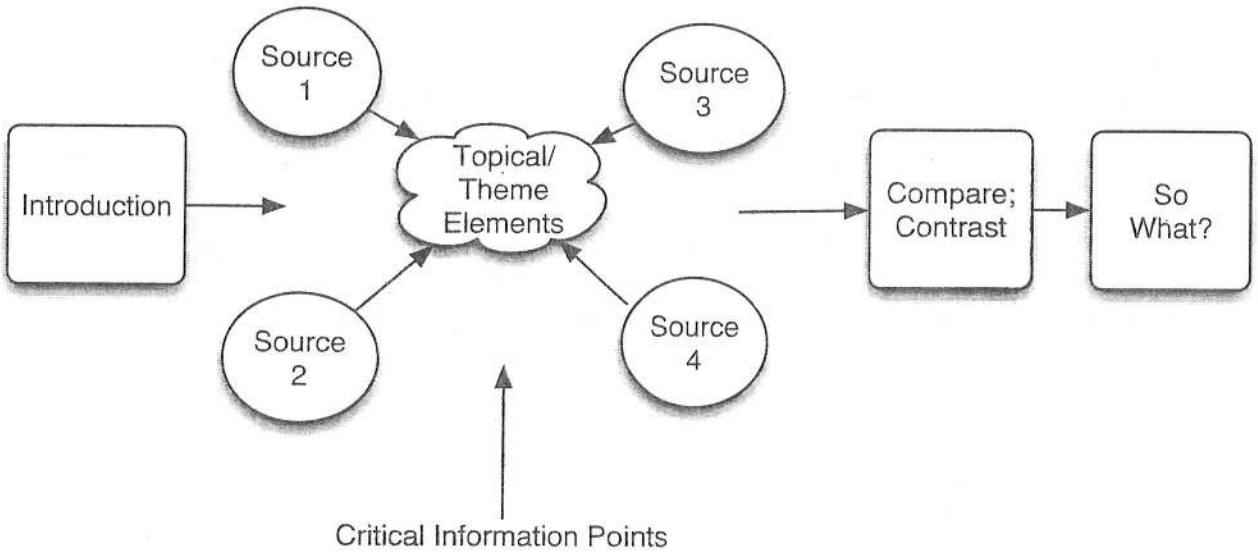
The Read, View, Listen Model

Introduce the topic(s) to be explored along with Objectives

Groups or individuals read, view or listen to many or several items on topic

Compare/ contrast items on theme elements

Summary/ synthesis Activity



Why Use This Model?

- Experience many literary/ written works rather than a single text
- Allow all skill levels to concentrate on the theme rather than the difficulty of the text
- Concept map the big ideas across texts
- See big picture across cultures, authors, governments, time periods, ideas
- When you can't afford a textbook but have a library

Possible Topics:

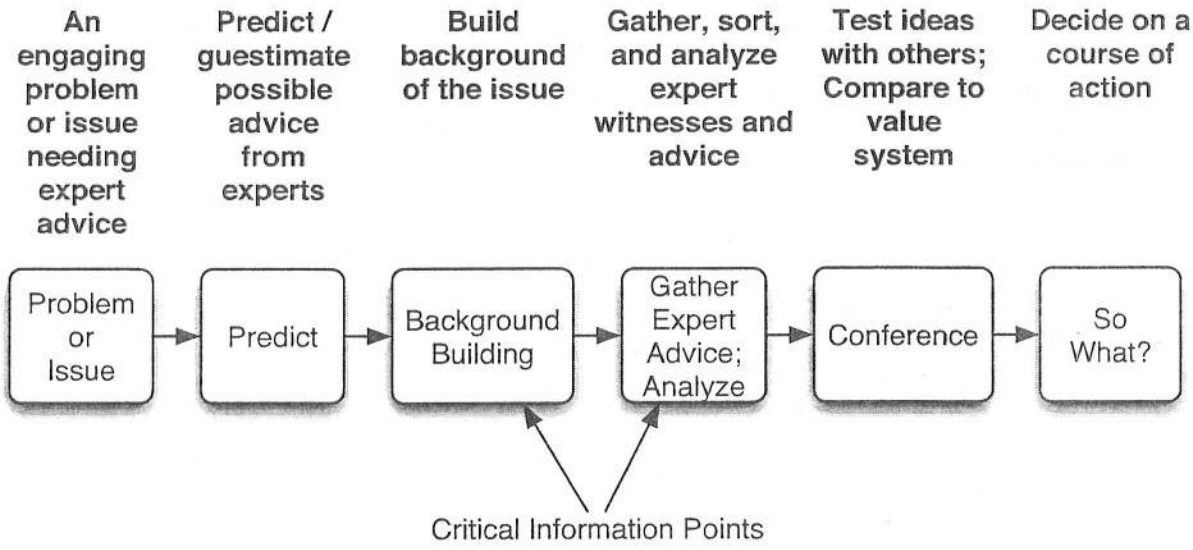
- Literary themes across books
- Similar literary themes across cultures
- Causes of wars across combatants
- News reporting across international newspapers & TV
- Teen angst across teen novels
- Comparison of cultures around the world at the same time period
- Lives of rich and poor - same time, same locale

Critical Information Literacy Skills*

- Pre-Reading Strategies, K&Z p. 52
- Skim, Scan, and Consider, K&Z p. 32
- Actively Read, View and Listen, K&Z p. 56
- Read Pictures, K&Z p. 70
- Compare, K&Z p. 98

*Koechlin, Carol and Sandi Zwaan. *Build Your Own Information Literate school.* Hi Willow, 2003

Advice to Action Model



Why This Model?

- To solve real problems
- Judge between good and poor advice
- Affect behavior: judging the difference between personal wishes and prudence
- Understanding the consequences of taking advice
- To understand how historical events were shaped by advice both good and poor
- Making life-saving decisions

Possible Topics:

- Healthy lifestyles
- Selecting a college or career
- Succeeding in school
- Preventing, controlling forest fires
- Urban sprawl
- Safe drinking water Vending machines in schools
- School fundraising initiatives
- School safety issues
- Helping the homeless

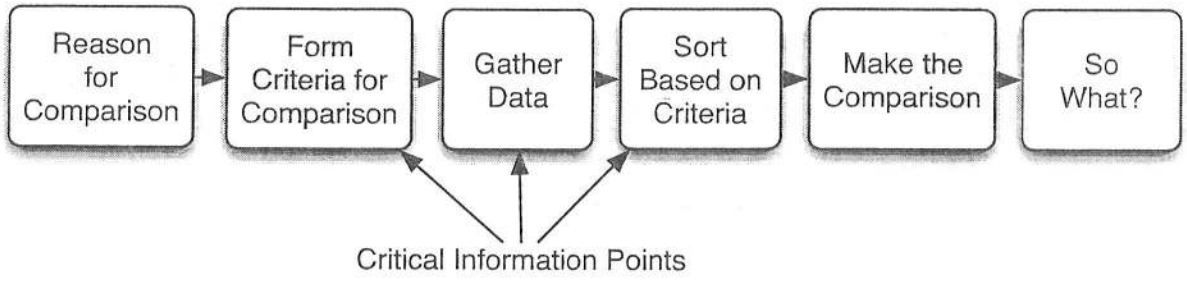
Critical Information Literacy Skills:

- Use Primary Sources, K&Z p. 46
- Evaluate Resources, K&Z p. 34
- Interpret, Infer, Predict, K&Z p. 130
- Understanding Perspective, K&Z p. 136
- Cause and Effect, K&Z p. 120

* Koechlin, Carol and Sandi Zwaan. *Build Your Own Information Literate School.* Hi Willow, 2003

Compare and Contrast Model

Identify purpose and items to be compared	Brainstorm and select the criteria for comparison	Use quality information sources; Gather data	Do the sort with tech assists if needed	Analyze the result	See the big picture



Why Use This Model?

- A much-researched and powerful teaching technique
- Stress quality information to achieve an accurate comparison
- Teaches reason over subjectivity
- Requires tough thinking
- Becomes the basis of many other teaching techniques with large or small data sets, facts, or ideas

Possible Topics:

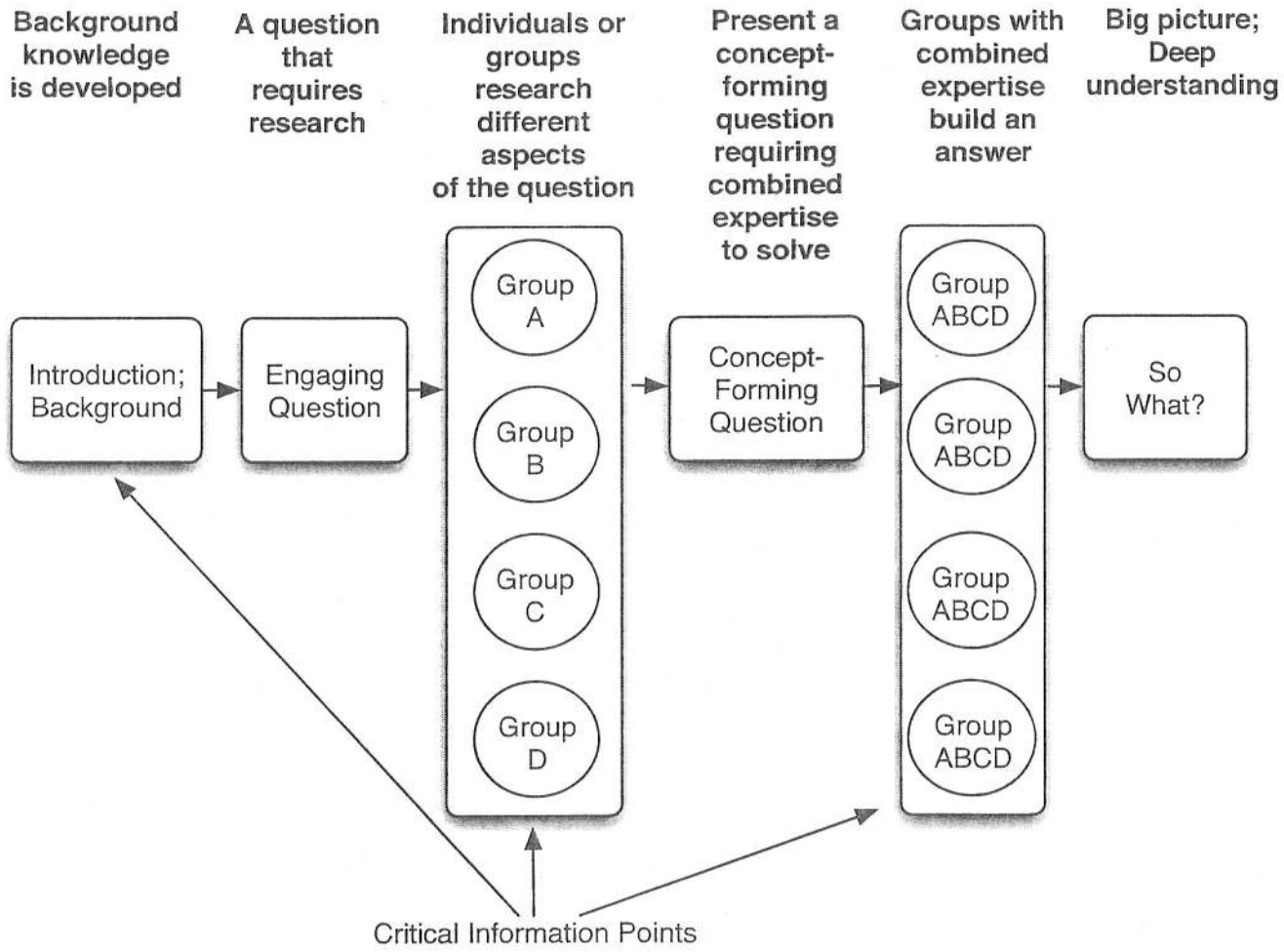
- Ideas
- Events
- Persons
- Cultures
- Governments
- Life skills
- Seasons
- Animals
- Plants
- Music
- Literature

Critical Information Literacy Skills*

- Use Primary Sources, K&Z p.46
- Evaluate Resources, K&Z, p. 34
- Note Making, K&Z p. 76
- Sort, K&Z p. 94
- Compare, K&Z p.98
- Synthesize, K&Z p. 145

*Koechlin, Carol and Sandi Zwaan. *Build Your Own Information Literate School.* Hi Willow, 2003.

The Concept Jigsaw Puzzle Model



Why This Model?

- To develop deep understanding rather than surface knowledge
- To develop group skills
- Two heads are better than one
- A prototype of the real world of business and industry
- To stimulate each learner into making a contribution
- Use to introduce lots of material quickly

Possible Topics:

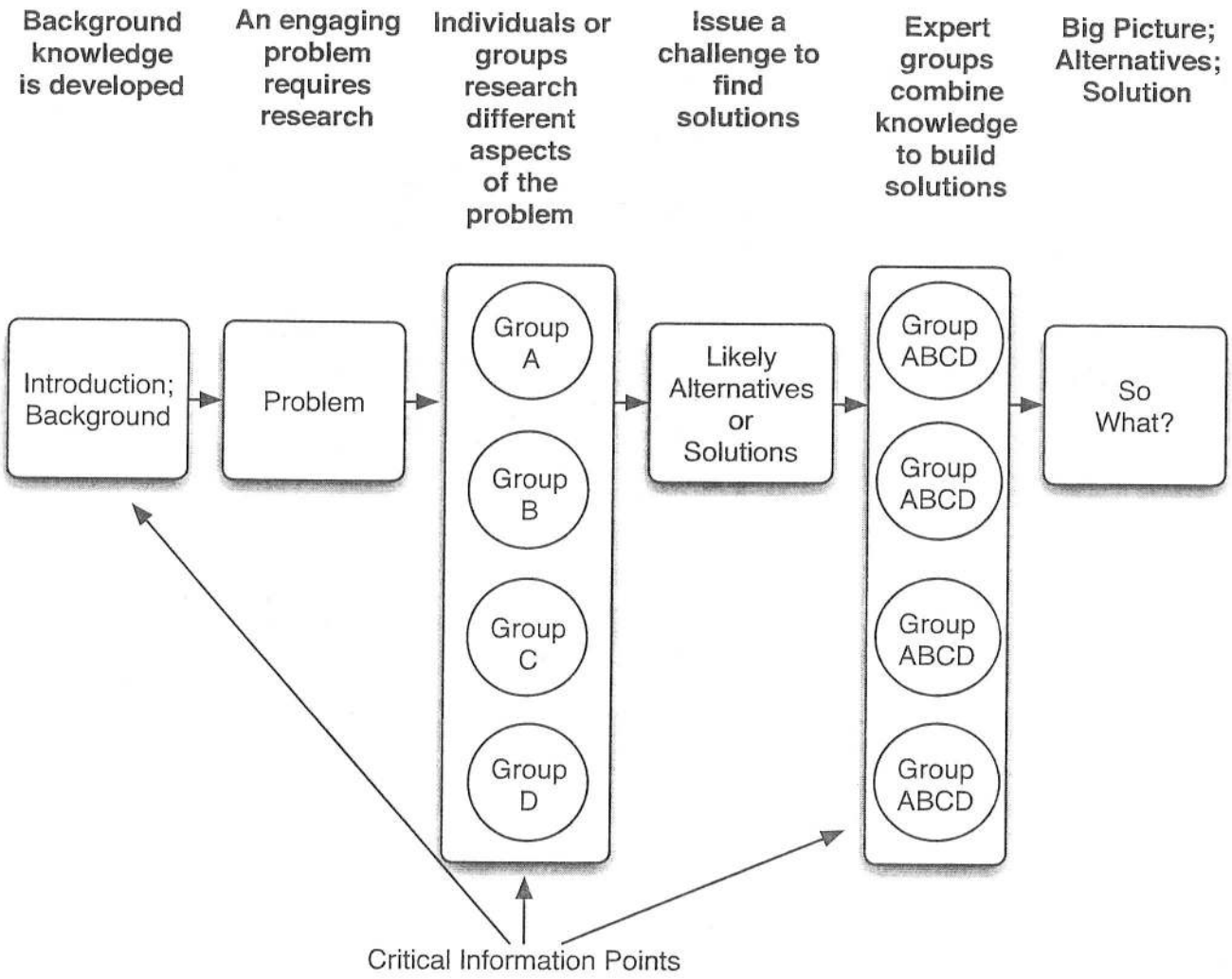
- Persons
- Places
- Things
- Events
- Ideas
- Movements

Critical Information Literacy Skills*

- Explore a Topic, K&Z p. 4
- Develop Questions, K&Z p. 12
- Locate Resources, K&Z p. 28
- Evaluate Resources, K&Z p. 34
- Collaborate, K&Z p. 140

* Koechlin, Carol and Sandi Zwaan. *Build Your Own Information Literate School.* Hi Willow, 2003

The Problems/Possibilities Jigsaw Puzzle Model



Why This Model?

- To learn real-world problem-solivng skills
- Build group problem-solving skills
- A prototype of the real world of business and industry
- To stimulate each learner into making a contribution
- To encourage investigation, determination, and perserverence

Possible Topics:

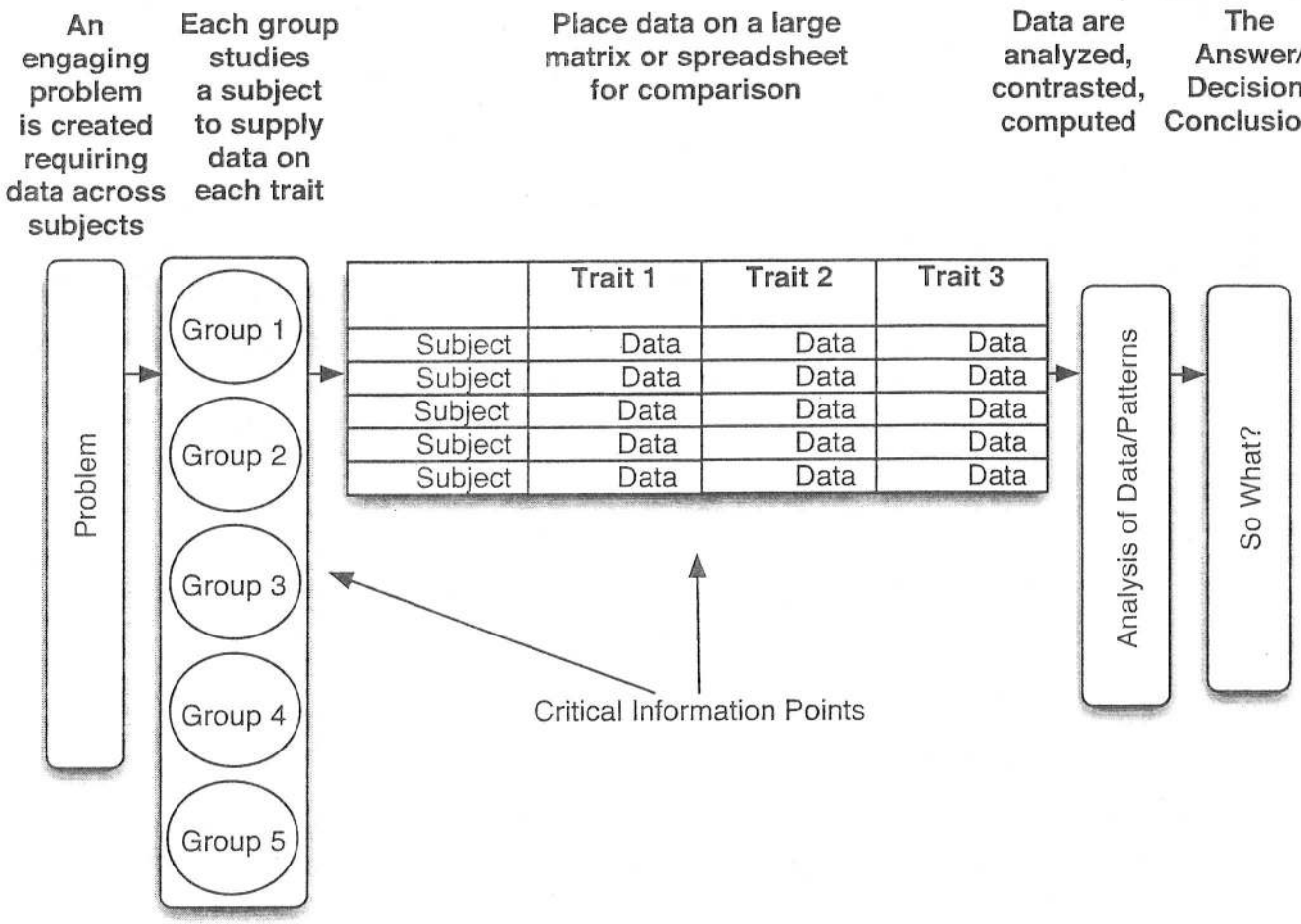
- Problems encountered at home, school, community, or nation
- Society problems such as poverty or health care
- Real problems created from learning experiences or projects

Critical Information Literacy Skills*

- Select Relevant Data, K&Z p. 54
- Note Making, K&Z p. 76
- Collaborate, K&Z p. 140
- Make Connections, K&Z p.116
- Synthesize, K&Z p. 145

* Koechlin, Carol and Sandi Zwaan. *Build Your Own Information Literate School.* Hi Willow, 2003

The Matrix Model



Why This Model?

- To promote accurate data gathering
- Organizing data for better decisionmaking or understanding
- Facilitating a look at patterns and trends
- Seeing the dangers of bad data in any cell
- Teaching complex issues; solving complex problems

Possible Topics:

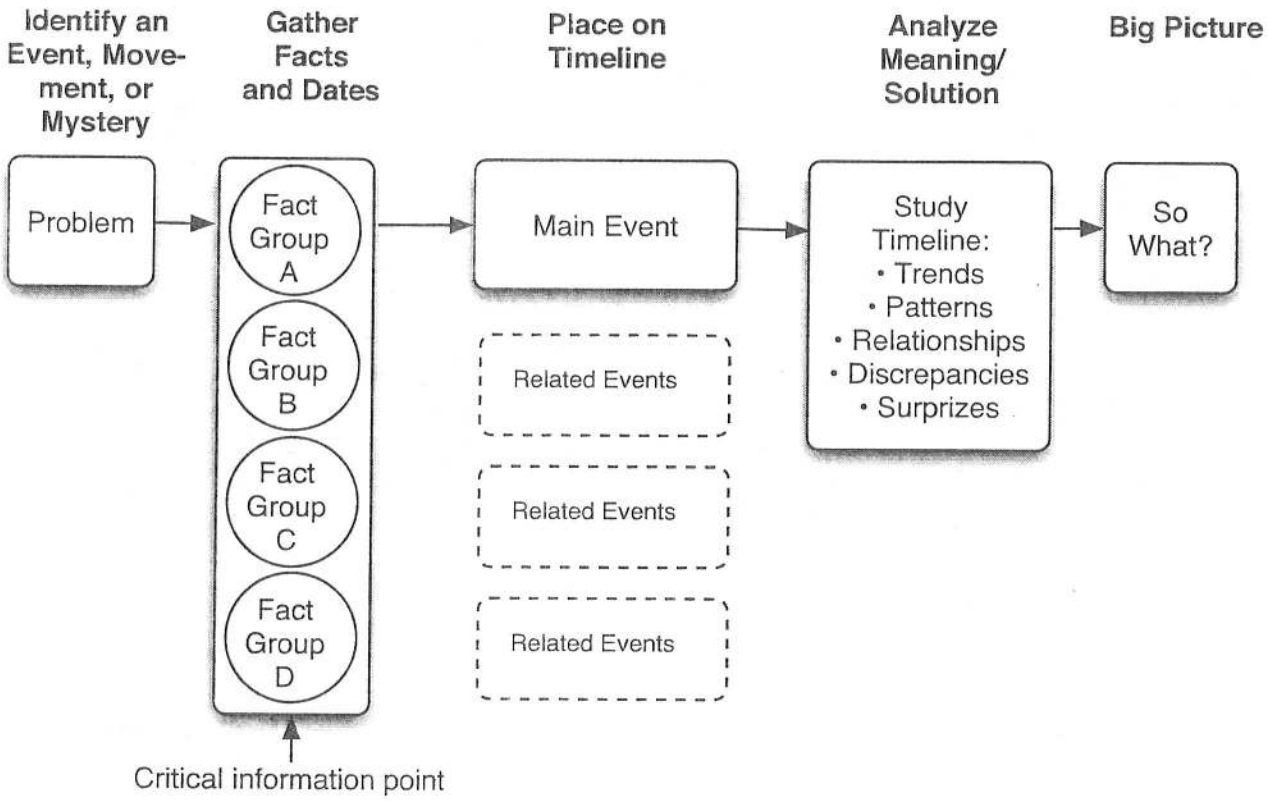
- Pick a pet for the classroom
- Are there weapons of mass destruction?
- Comparison of possible new highways
- Comparison of expert opinions about a topic
- Comparison of candidates for office
- Comparing topics of interest

Critical Information Literacy Skills*

- Evaluate Resources, K&Z p. 34
- Select Relevant Data, K&Z p. 62
- Legal and Ethical Use of Information and Ideas, K&Z p. 82
- Share and Use, K&Z p. 156
- Reflect, Transfer and Apply, K&Z p. 166

* Koechlin, Carol and Sandi Zwaan. *Build Your Own Information Literate School.* Hi Willow, 2003

The Timeline Model



Why this Model?

- Show changes over time
- Determine why something developed the way it did
- Understand how inaccurate information will distort the analysis of sequencing
- Make comparisons of the past and the present
- Put some events in a larger perspective
- Trace the background to explore cause and effect
- Understand sequence
- Visualize sequential patterns

Possible Topics:

- Chart a political election
- Study a catastrophic event
- Compare various disciplines during a time period
- Reconstruct the events of a crime or event
- Chart the Middle East conflict
- Study the rise of terrorism as warfare
- Chart the plot of a novel or story
- Study the structure of a symphony
- Put a a period of art into its environment
- Study what made landing on the moon possible
- Chart the immigration of a family to the U.S.

Critical Information Literacy Skills*

- Actively Read, View & Listen, K&Z p. 56
- Select Relevant Data, K&Z p. 62
- Sort, K&Z p. 94
- Note Making, K&Z p. 76
- Identify and Investigate Patterns and Trends, K&Z p. 108

*Koechlin, Carol and Sandi Zwaa. *build Your Own Information Literate School.* Hi Willow, 2003

Think Model #10

History & Mystery Model

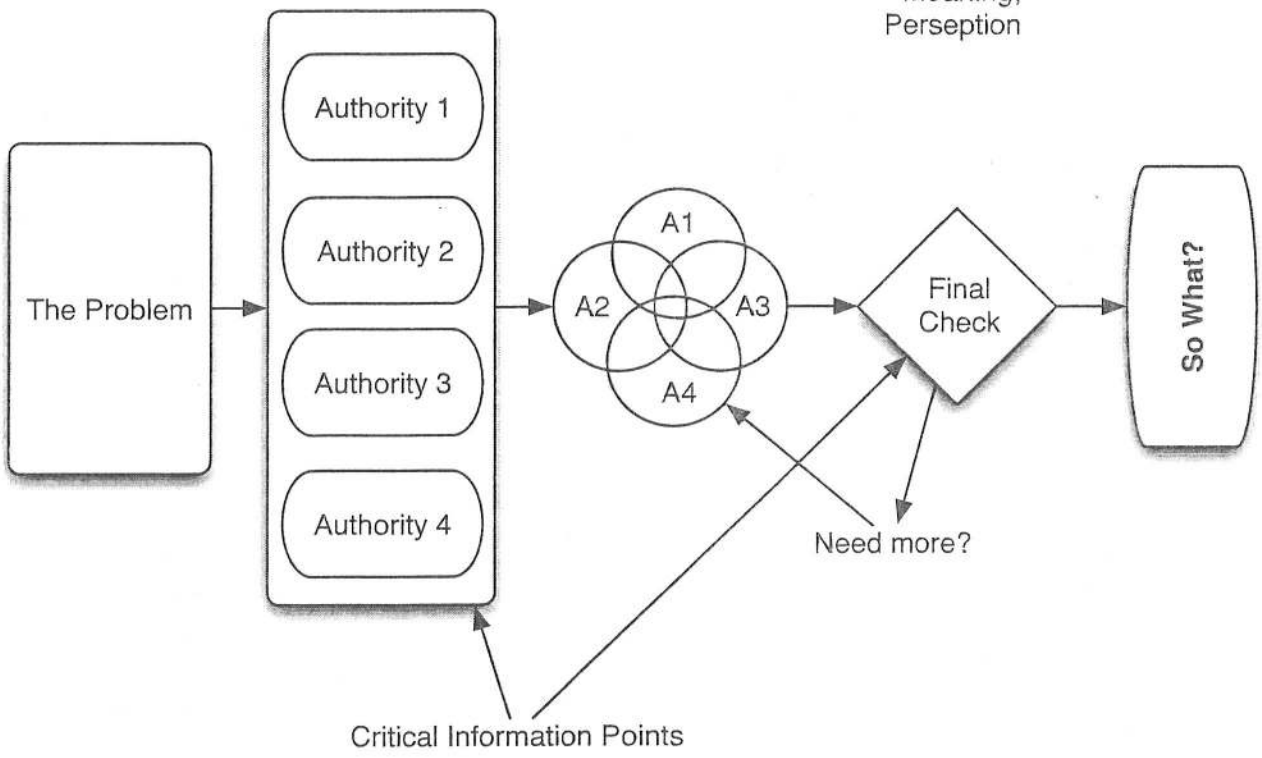
Build a Case for Solving the History/Mystery Problem

Study Primary/Secondary Evidence

Compare/ Contrast Activity

Check Evidence
- New Evidence Available?
- Reject some Data?
- Meaning; Perseption

Resolution



Why Use This Model?

- When, where, and what appears to have happened?
- What really happened?
- Why did it happen?
- What could have prevented it from happening?
- What can we learn based on what happened and why?

Possible Topics

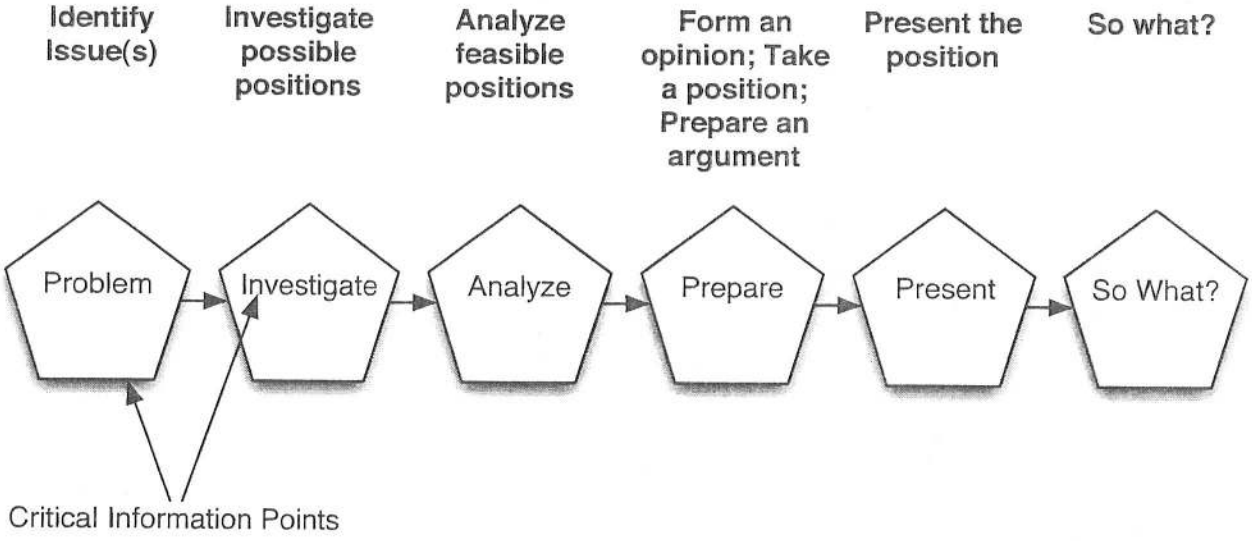
- Causes of war
- Change in government
- Natural catastropies
- Advances in technology
- Influence of artists/ authors
- Development of art forms and genres

Critical Information Literacy Skills*

- Select Relevant Data, K&Z p. 62
- Sort, K&Z p. 94
- Determining Fact, K&Z p. 66
- Compare, K&Z p. 98
- Make Connections, K&Z p. 116

* Koechlin, Carol and Sandi Zwaan. *Build Your Own Information Literate School.* Hi Willow, 2003.

Take a Position Model



Why This Model?

- Learn to take positions on sound ideas rather than on snap judgments
- Learn how to understand ideas much different than your own
- Develop critical analysis skills in the face of propaganda
- Build empathy for all positions, even as you take a stand
- Learn to articulate and defend a position taken
- Build the skills for living and participating in a democratic society

Sample Topics

- Political issues
- Controversial science problems
- Historical issues
- Moral issues
- Community problems
- School problems
- Literary critical issues

Sample Products:

- Position paper
- Persuasive speech
- Video presentation
- PowerPoint presentation
- Debate
- Panel discussion
- Switch positions, then present
- Action plan

Critical Information Literacy Skills*

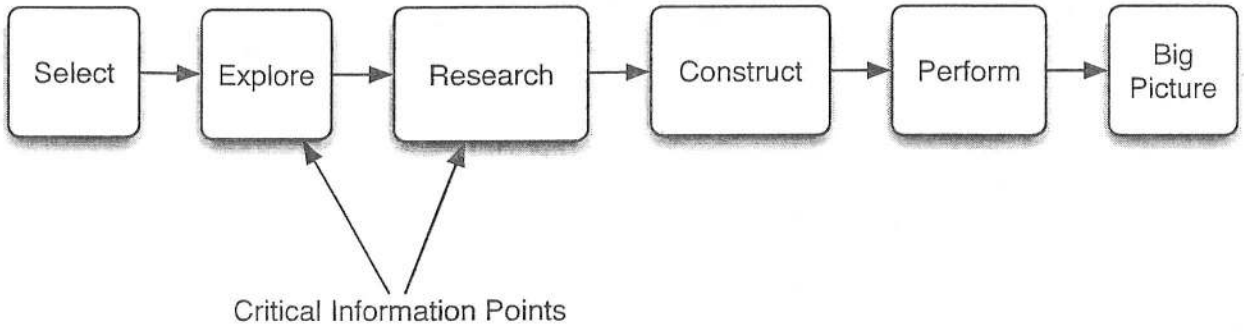
- Actively Read, View, and Listen, K&Z p. 45
- Select Relevant Data, K&Z p. 62
- Determine Fact, K&Z p. 66
- Understanding Perspective, K&Z p. 136
- Share and Use, K&Z p. 155

* Koechlin, Carol and Sandi Zwaan. *Build Your Own Information Literate School.* Hi Willow, 2003

Think Model #12

The Re-Create Model

Select event, issue, time period piece	Explore event/ drama	Research every possible aspect to ensure authenticity	Select Format and Construct	Perform as: • Drama • Event • Diary • Newspaper • Picture • Painting • Story	Big Picture



Why This Model?

- Why do things, seemingly strange, make sense in context?
- What kinds of persons contribute or distract while a major event is unfolding?
- What can we learn from the unfolding of major events?
- How does excellence in the reconstruction of an event help in the understanding of that event?
- Can we develop empathy for people in their time and place?
- Can we walk in someone else's shoes?
- So we judge the difference between fiction and realistic fiction.

Possible Topics:

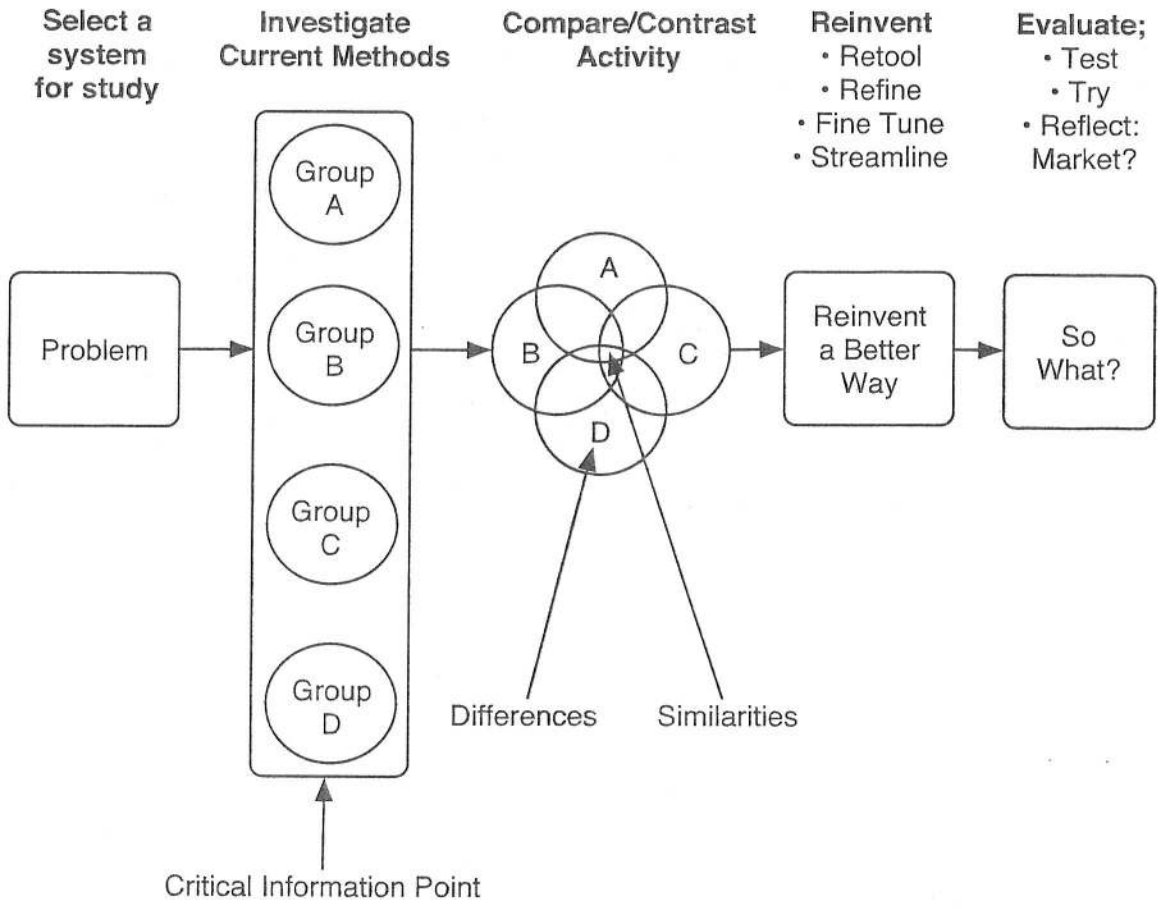
- Life in a place/time
- Historical event
- Perform a play that requires authenticity
- Pioneer life
- Slavery
- Interview an historical personality

Critical Information Literacy Skills*

- Use Primary Sources, K&Z p. 46
- Read Pictures, K&Z p. 70
- Make Connections, K&Z p. 116
- Interpret, Infer, Predict, K&Z p. 130
- Respond to Text, K&Z p. 112
- Impact, K&Z p. 124

* Koechlin, Carol and Sandi Zwaan. *Build Your Own Information Literate School.* Hi Willow, 2003.

Reinventing a Better Way Model (Systems Analysis)



Why Use This Model?

- Much of our economy depends on efficiency
- Prepares for competitions (best ideas)
- Production and marketing plans and Patents
- Stimulates creativity
- Simulates authentic problems
- Builds group work skills
- Saves time, money, natural resources, and energy

Possible Topics:

- New ways to handle school problems
- Living within a family's means
- Ways to save money, time, and effort
- Create a labor-saving device
- Solving a pesky real-life problem

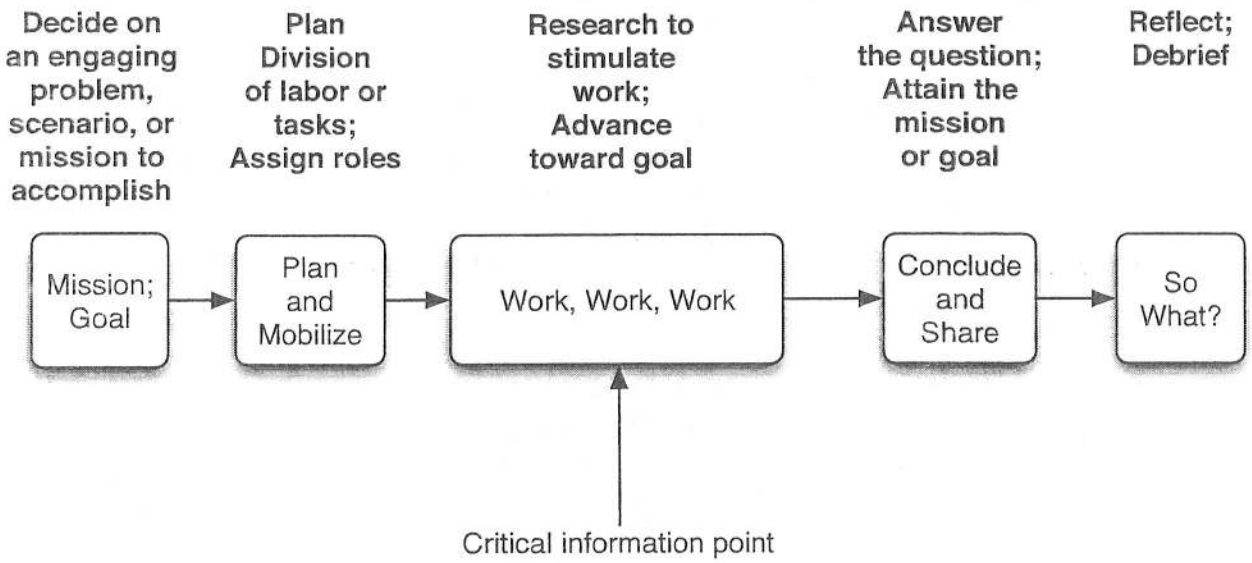
Critical Information Literacy Skills*

- Use Primary Sources. K&Z p. 46
- Make Connections, K&Z p. 116
- Use Organizers, K&Z p. 90
- Synthesize, K&Z p. 146
- Reflect, Transfer & Apply, K&Z p. 165

* Koechlin, Carol and Sandi Zwaan. *Build Your Own Information Literate School.* Hi Willow, 2003.

Think Model #14

The Quest Model
(The Well-Designed Research, Experiment, or Project)



Why Use this Model?

- Capture Realism; Build Expertise
- Build responsibility and independence
- Prepare for college or a profession
- Build a sense of achievement
- Capitalize on natural curiosities
- Make the curriculum relevant
- Develop deep understanding

Possible Projects:

- Formal Research Paper
- Web Quest
- I-Search Paper
- Simulation Game
- Scientific challenge/ competition
- Senior Paper
- Independent Study
- Recital

Critical Information Literacy Skills*

- Define and Clarify, K&Z p. 1
- Locate and Retrieve, K&Z p. 23
- Select, Process, and Record Data, K&Z p. 51
- Analyze, K&Z p. 89
- Synthesize, K&Z p. 145
- Share and Use, K&Z p. 155
- Reflect, Transfer, and Apply, K&Z p. 165
- Adding It All Up, K&Z, p 173

* Koechlin, Carol and Sandi Zwaan. *Build Your Own Information Literate School.* Hi Willow, 2003.

Mix It Up!

(Be Creative in Combining/Modifying All the Models)

Appetizers:

Background to Question Model
Sensemaking Model
Read, View, and Listen Model
Advice to Action Model
Compare and Contrast Model

The Main Course:

The Concept Jigsaw Puzzle Model
The Problems/Possibilities Jigsaw Puzzle Model
The Matrix Model
The Timeline Model
The History and Mystery Model
Take a Position Model
The Re-Create Model
The Reinventing a Better Way Model
The Quest Model

Examples:

- Do a Major Background to Question study before a Quest
- Do a Matrix before having to Take a Position
- Sensemake a problem before trying to Reinvent it
- Compare and Contrast as a History/Mystery Model unfolds
- Begin with a Jigsaw and then culminate with a Matrix

Designing Curriculum for the 21st Century Classroom

Allison Zmuda
Senior Education Specialist
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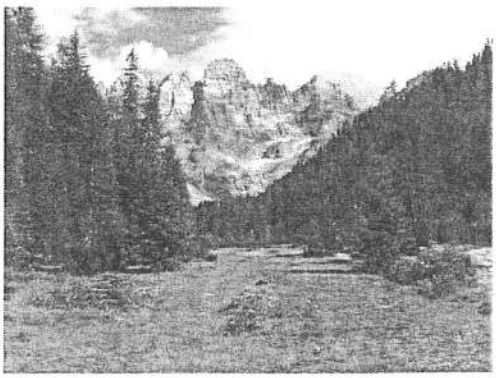

Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Treasure Mountain Retreat

Designing Curriculum
for the 21st Century Classroom

Allison Zmuda, Presenter
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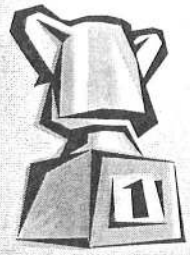
1

Why are we here?



"Guaranteed and viable curriculum is the #1 school-level factor on impact on student achievement."

-- Marzano *What Works in Schools*, p. 25

2

A guaranteed curriculum

- Gives all students core knowledge, skill and understandings delineated in the district standards
- Connects to grade level expectations in each of the content areas
- Links grade level expectations from one year to another
- Includes common assessments that provide information about student learning across classrooms
- Suggests appropriate instructional strategies and resources for students who struggle to meet district standards
- Routinely integrates technology and information skills
- Provides opportunities for students who are ready to extend their learning once the core curriculum is mastered

3

A viable curriculum

- Is feasible to teach given existing resources (time, class size, teacher skill)
- Is limited to expectations that are developmentally appropriate
- Is continually refined based on data related to the effectiveness of the curriculum in raising student achievement
- Is balanced in both the depth and breadth of coverage
- Is clear about expected content and instructional strategies for new teacher and experienced teacher alike

4

So, what's the problem?

"As is so often the case in 'can-do' America, and especially in education, we are headlong in pursuit of answers to questions we haven't even asked. We are busy implementing solutions to problems that we neither fully understand nor agree on. We are operating on assumptions or perhaps even myths."

-- Making the Grade

5

Handling a glut of information

"Instead of information scarcity, we have information glut. It is now commonly believed that the amount of stored information is *doubling* every five years, and most of it is almost as available as tap water. . . The real challenge is how to filter and make sense of all the information that bombards us daily. Reasoning skills are more important than ever as we try to sort out both what is true and what is important from the overwhelming amount of data available online."

-- Making the Grade

6

The goal of education

"More than ever, the sheer magnitude of human knowledge renders its coverage by education an impossibility; rather, the goal of education is better conceived as helping students develop the intellectual tools and learning strategies needed to acquire the knowledge that allows people to think productively about history, science and technology, social phenomena, mathematics and the arts." -- *How People Learn*

7

Out of touch with the rich information and technology

"Few curriculum leaders, policymakers, school administrators, and teachers have taken any notice. True, we have spent billions hooking up the Internet and turning it on, but we have paid less attention to what's on the wires than the wires themselves."

-- *Ban Those Bird Units*

8

The price of antiquated learning environments

"From the standpoint of the child, the great waste in school comes from his inability to utilize the experience he gets outside . . . while on the other hand, he is unable to apply in daily life what he is learning in school. That is the isolation of the school – its isolation from life."

-- John Dewey

9

What's changed?

"All pedagogy must be redesigned or reinvented to work as the information and technology environment evolves."

-- *Ban Those Bird Units*

- How much have learning environments changed in the past ten years? The spaces where people work? The technology they use? The skills they have? The skills they don't?

10

When do our beliefs really limit how we teach our kids?

- Every organization is perfectly designed to get the results it gets.
- The ways in which schools organize their work affects what teachers and students learn and what they do.

11

What classroom teachers need -- your designs

"In education we've expected too much from teachers. We've expected them not only to play the violin but also to write the concerto, and if they don't do that, we imply that they're not exercising their creativity. But in fact, we've got our definition of creativity wrong."

-- James Stigler

12

Questions at the heart of your work

- What should all graduates from our systems know, be able to do, and understand?
- How do we motivate all students to want to achieve at higher levels in a world that is more demanding and confusing than ever?
- What should the schools of the future look like? How do we motivate educators and other adults to work together in new ways to create them?

13

Striving for competency

"The goal of competency makes clear that the aim of education is not the ability to acquire and retain information—the traditional formulation. . . I believe that framing education goals as the ability to do something with what you know—to apply information in the search for a solution to a problem or to create new knowledge—creates an expectation of more rigorous forms of accountability and assessment."

-- Making the Grade

14

Six clusters of competence

Developed by Hugh Price, President of National Urban League, adopted by Education Program of Bill & Melinda Gates Foundation

1. Literate: Capable of demonstrating a working command of reading, writing, and speaking in English.
2. Mathematically competent: A command of basic computational skills required in the modern workplace and in everyday adult life.
3. Problem solvers: Eager to seek out information, discover answers, and apply their skills in reasoning and critical thinking to solving problems.

15

Six clusters of competence

Developed by Hugh Price, President of National Urban League, adopted by Education Program of Bill & Melinda Gates Foundation

4. Scientifically literate: Capable of appreciating nature and the environment, familiar with the scientific method and role of science in modern life, and cognizant of the uncertainties of the scientific method.
5. Good citizens: Well grounded in the forces and values that have shaped this nation. . .with an appreciation for the relationship of the United States to the rest of the world and this country's role in the world.
6. Technologically advanced: Comfortable with technology and capable of using computers and related technologies in the normal course of everyday work and learning. -- *Making the Grade*

16

"Backward" design logic

1. What do you value?
2. How do you assess what you value?
3. How does what you value and how you assess shape instruction?

17

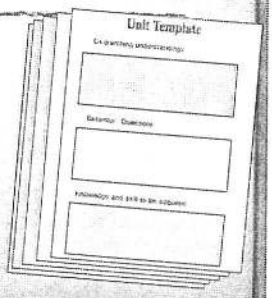
Enduring Understandings about *Understanding by Design*

- "Backward design" requires clarity on desired results and evidence of them *before* designing lessons and activities.
- It remains 'coverage' and 'nice activities' unless the work is focused on penetrating questions and big ideas, related to Standards.
- UbD is a way of thinking more carefully about design, not a program.

18

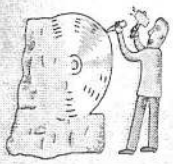
Curriculum design template

- Fosters a "mental template" for effective design
- Fosters alignment among standards, big ideas, essential questions, assessments and learning activities



19

What does a designer using this template think about?



- As things are now, education is so cluttered and tangled up with a thousand senseless notions and stupidities, that the task of reformation is almost a superhuman one. It is entirely a task of taking away and reducing – not one of adding to or explaining. It is the task of the sculptor, who cuts the superfluous marble off, rather than that of the wax-workman who lays on the stuff thicker and thicker.

– Walt Whitman

20

If backward design is the solution, what are some of the problems?

- ✓ Curricula that is a mile wide and an inch deep
- ✓ Hazy conception of design
- ✓ Different learners all in the room together

21

Problem: "A mile wide and an inch deep"

- "In science, existing curricula tend to overemphasize facts and underemphasize 'doing science' to explore and test big ideas (American Association for the Advancement of Science, 1989; National Research Council, 1996)
- "In mathematics it has been argued that curricula emphasize not so much a form of thinking as a substitute for thinking. The process of calculation or computation only involves the deployment of a set routine with no room for ingenuity or flair, no place for guess work or surprise (Scheffler, 1986).

-- Bransford, *How People Learn*

22

Problem: Hazy conception of design

"The irony is that though we all claim as teachers to seek student understanding of the content, we may not adequately understand this goal. Teachers knowingly aim for understanding every day, don't we? How can we not know what we are aiming for? Yet, there is plenty of evidence to suggest that 'to understand' and 'teach for understanding' are ambiguous and slippery terms."

-- Grant Wiggins and Jay McTighe

23

Problem: Hazy conception of design

- *A 1st grade teacher reads her children a story. Then she asks them to draw a picture of what they heard.*
- *A 5th grade teacher talks with her students about black holes. Then she shows them a video about the topic. She asks them to write a story about black holes.*

24

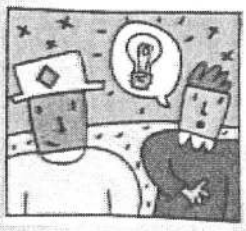
Problem: Hazy conception of design

"In each example, the teacher had a hazy conception of what children should gain from their experience with content. Students did 'something about the story,' 'something about black holes.' The activities weren't deadly dull or totally useless. Nonetheless, they present at least two problems. One is a barrier to high-quality teaching and learning. The other is a barrier to differentiated instruction.

-- Carol Ann Tomlinson,
The Differentiated Classroom

25

Problem: Different learners in the same room



I learn like a _____
because _____

Example: I learn like a window. When I'm open/receptive, great things can blow in and stay, but when I'm closed/not ready, it is very difficult to impact my thinking.

26

Student Responses

- I learn like a magnet. Certain things I learn well, certain things I don't learn. Like magnets only stick to metal.
- I learn like a spider. I see something come towards me and crawl away and hide. But it will come to get me anyway.
- I learn like a reporter. I learn by asking questions.
- I learn like a little kid. Interesting stuff I understand. Boring things go in one ear and out the other.

27

Student Responses

- I learn like a tape recorder. I know the information for the test and then I erase it.
- I learn like a plant. The more I drink, the more I grow.
- I learn like water on plastic. Most of the time knowledge rolls right off of me.
- I learn like a cooked chicken. All of the bad (fat) goes off and the good things (seasonings) stay in.
- I learn like a secretary. I take information and file it.
- I learn like a chicken without a head. I run around confused.
- I learn like a prism because I separate all of the information.

28

Student Responses

- I learn like a crude RAM chip. I retain a little information but it is lost quickly.
- I learn like a turtle. I'm a bit slower than most, but wiser than the rabbit.
- I learn like a bobblehead, I just nod my head.
- I learn like a doorknob. I don't.
- I learn like a sponge, I absorb everything.
- I learn like an old rag. At first I soak up all the information but soon I lose it all except for the big concepts.
- I learn like a radio listener because you must be entertaining and sound good in order for me to listen.

29

Student Responses

- I learn like a calculator. I can figure out a problem but forget it after I'm done.
- I learn like a window because I'm so open-minded.
- I learn like a taxi because my mind goes all over town.
- I learn like a mechanic, whatever the problem is, I will answer it and fix it until the customer is satisfied.
- I learn like a kid on a beach with a sieve trying to fill it with sand using my hands. There is a ton of information being packed into my head and as more information is smushed in, some inevitably leaks out. Yet I continue to scoop sand in as fast as I can.

30

Student Responses

- I learn like a CEO of a major corporation. Nothing can be left behind, everything has to be perfect and there can be no instability on my part. If anything like this goes wrong, my company (my mind) will crumble.
- I learn like a marathon runner, only I don't know where/what the finish line is or whether I'll ever reach it. I keep running, but sometimes I trip and I fall and I wonder whether I'll ever get back up again. Sometimes it's as though someone is picking the finish line up and moving it farther and farther away from me.

31

Three stages of backward design

1. Identify desired results
2. Determine acceptable evidence
3. Plan learning experiences & instruction

32

Stage 1 – Desired results

Established Goals:

Understandings:
Students will understand that...

Essential Questions:

Students will know...

Students will be able to...

33

Desired results for Stage 1

Participants will understand that:

- Desired results embody state requirements, not just align with them.
- Goals (both technical proficiency and wisdom) are guaranteed for all learners, but the route to achieve those goals is differentiated.
- If you value the desired result, it must be measured.

34

Standards and school improvement

- "Clear, intelligible standards are a pillar of high achievement. Aligned with appropriate assessments, they can help us realize the dream of learning for all. They are at the heart of the infrastructure for school improvement."

-- Schmoker and Marzano (1999)

35

How do I manage so many established goals?

- 160 national and state-level standards documents
- More than 2000 pages and 14 pounds
- A synthesis yielded *255* standards and *3,968* benchmarks

36

How do I manage so many established goals?

- Would require an additional *15,465* hours for students to learn them all!
- 9 more years (K-21)

Marzano

37

What the research says

"Research on expertise suggests that a superficial coverage of many topics in the domain may be a poor way to help students develop the competencies that will prepare them for future learning and work."

-- Bransford, *How People Learn*

38

Working to earn insights

"If we really understand what we have been told, we make new connections for ourselves. We are now the master of these connections and can express them our own way. If we cannot make these new connections for ourselves, we do not really grasp what we have been told. . . Piaget's emphasis is that we have to do the work ourselves, making the connections, even if people take pains to point out to us connections they have been able to make"(p. 18)

-- Duckworth, "The Having of Wonderful Ideas"

39

Content standard:

Students will define their information needs and identify effective courses of action to conduct research and solve problems.

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
•There are numerous ways to solve information problems. •The quality of the question determines the quality of the results. •Asking questions leads to identifying important problems to be solved.	•What is my job when looking for information? •How do I know what questions to ask? •What are the benefits of being a skeptic?

40

Three stages of backward design

1. Identify desired results
2. Determine acceptable evidence
3. Plan learning experiences & instruction

41

Stage 2 – Assessment evidence

Performance Task(s):	Other Evidence:

42

Desired results for Stage 2

Participants will understand that:

- Assessment not only measures student performance, it motivates it.
- "Thinking like an assessor" requires a different skill set than being a great instructor.
- If you value the desired result, learners deserve accessible opportunities to demonstrate learning.

43

What is acceptable evidence of understanding?

- Someone can be knowledgeable and skilled without having understood what one has learned.
  - Knowledge is about facts
  - Understanding is about what facts may mean and how they may be used
- An understanding provides a *way to make personal meaning* of various facts or skills
  - Makes them come to life
  - Isolated and inert bits of knowledge are made into a vital system

44

Focus on evidence

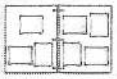
Consider a judicial analogy:

> Students should be presumed innocent of understanding until proven guilty by a preponderance of evidence.

45

Recognizing the limits of testing

"Evaluation is a complex, multi-faceted process. Different tests provide different information, and no single test can give a complete picture of a student's academic development.



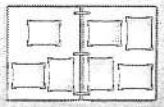
-- from CTB/McGraw-Hill *Terra Nova* Test Manual

46

Reliability: Snapshot vs. photo album

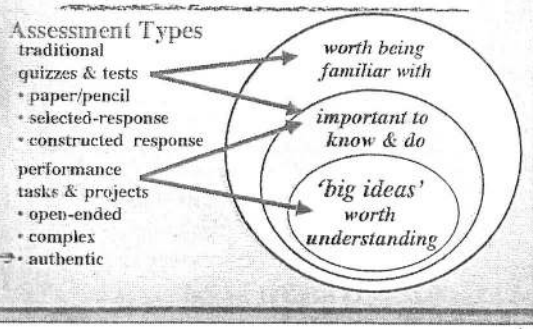
We need patterns that overcome inherent measurement error

- Sound assessment (particularly of State Standards) requires multiple evidence over time - a photo album vs. a single snapshot



47

Link assessment types to curricular priorities



48

Linking the stages together

] Are you assessing everything that you value (Stage 1)?
- Be cautious about assessing only that which is easiest to measure
- Must evaluate all enduring understandings, knowledge, and skills

] Consider the *consequences* of assessments on the learning plan (Stage 3)

49

Core tasks are worthy and in realistic contexts

- ✓ What realistic work, in what messy situations, do experts in information technology and citizens using information actually face?
- ✓ What tasks would provide evidence of what you expect all graduates to know, be able to do, and understand?
- ✓ Who is responsible for the development of these tasks? The implementation? The evaluation?

50

Core tasks for a department

- Example: History
  - Makes sense of multiple, conflicting primary & secondary accounts
  - Do an oral history
  - Journalistic background: the history of a present problem/issue/event
  - Build informative multi-media historical exhibits

51

Specific core task in U.S. History

- Your goal is to determine why the urban riots of the late 60's happened. You are one of many august members of an LBJ appointed panel, the Kerner Commission, who must report to the president and the country on why the violence happened and what can be done about it.
- You will produce a collective report that must be thoughtful, thorough, and clearly presented. Your personal contribution will be judged through journal entries, observations of work and discussion, and sections of writing you produce.

52

Find lots of ideas in the language of the Standards

- Key verbs suggest the important performance abilities
- Key nouns reflect the big ideas
  - Important to anchor curriculum in core tasks which recur K-12
  - Important to frame curriculum around essential questions to ensure content can be prioritized around big ideas

53

Agree on "core tasks" per program (via standards)

Example: Math
- Make sense of messy and inconclusive data
- Model real-world phenomena
- Solve multi-step non-routine problems
- Use technology to solve complex problems (spreadsheets, graphing calculators, etc.)

54

Three stages of backward design

1. Identify desired results
2. Determine acceptable evidence
3. Plan learning experiences & instruction

55

Desired results for Stage 3

Participants will understand that:

- The right moves in teaching are made in light of what the learning requires.
- If you value the desired result, learners deserve accessible opportunities to explore, receive feedback, and refine their learning.

56

Balancing skill development with pursuit of understanding

- "A challenge . . . is to strike the appropriate balance between activities designed to promote understanding and those designed to promote the automaticity of skills necessary to function effectively without being overwhelmed by the additional requirements. Students for whom it is effortful to read, write, and calculate can encounter serious difficulties in learning."

  -- Bransford, *How People Learn*, p. 139

57

Formats of the learning plan

- Calendar format
  - Day 1, Day 2... or Week 1, Week 2...
- Sequence format
  - Bulleted or numbered list in order of appearance (not necessarily linked to time)
- Parts format
  - Key components/phases of learning

58

Articulate the purpose behind the activity

Backwards-design logic

- I do this _____ (activity) in order to prepare them for this _____ (task).
- I do this _____ (activity) in order to explore this _____ (essential question).
- I do this _____ (activity) in order to become familiar with/more proficient using this _____ (knowledge and skill).

59

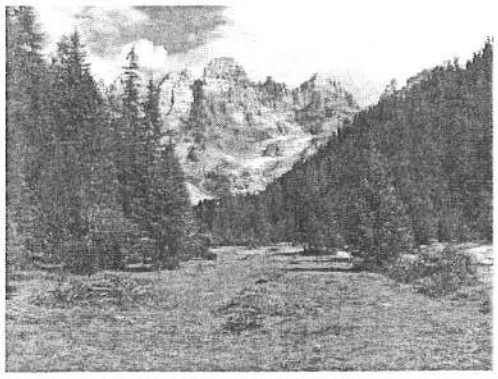
Questions at the heart of your work

- What should all graduates from our systems know, be able to do, and understand?
- How do we motivate all students to want to achieve at higher levels in a world that is more demanding and confusing than ever?
- What should the schools of the future look like? How do we motivate educators and other adults to work together in new ways to create them?

60

Bird Unit Transformations

Graduate Students at San José State University



Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Introduction to the Transformations

For about two years, students in the graduate program of the School of Library and Information science at San José State University have been learning how to transform learning experiences using the models from *Ban Those Bird Units*. Students in the instructional design class ranged from prospective school library media specialists to academic, public, and special librarians. They were required to do eight practice transformations and a full-scale transformation with a real teacher, professor, or client.

Douglas Achterman, the co-instructor for the course with David Loertscher, provided guidance for students as they transformed low-level learning activities into higher-level ones as follows:

1. What's the big picture I want the students to get? (For K–12, a follow-up question: What standards align with this concept?)
2. What product will I have students produce to show they "get it"?
3. What characteristics of my group do I need to consider in designing the final product?
4. What skills will I need to help students build in order to be successful in this unit (info. lit., technology, reading, etc.)?

Then as a helpful rubric, students were given the following advice for the product.

1. Activity is engaging and relevant
2. Transformation incorporates information literacy skills
3. Student products will demonstrate understanding of the "big picture."
4. Transformation requires students do higher level thinking with the data after they've gathered it (analyze, compare/contrast, determine cause & effect, evaluate, synthesize, etc.).

Finally, students were encouraged to tackle a variety of topical areas commonly addressed in assignments given to students in all levels of education:

1. Peoples: individuals, groups, cultures, civilizations
2. Places: local, national, international
3. Ideas, issues and ideologies
4. Events or movements
5. Physical world
6. Living world
7. Systems: human nature, social, manufacturing, organizations
8. The Arts: fine, applied, industrial, etc.

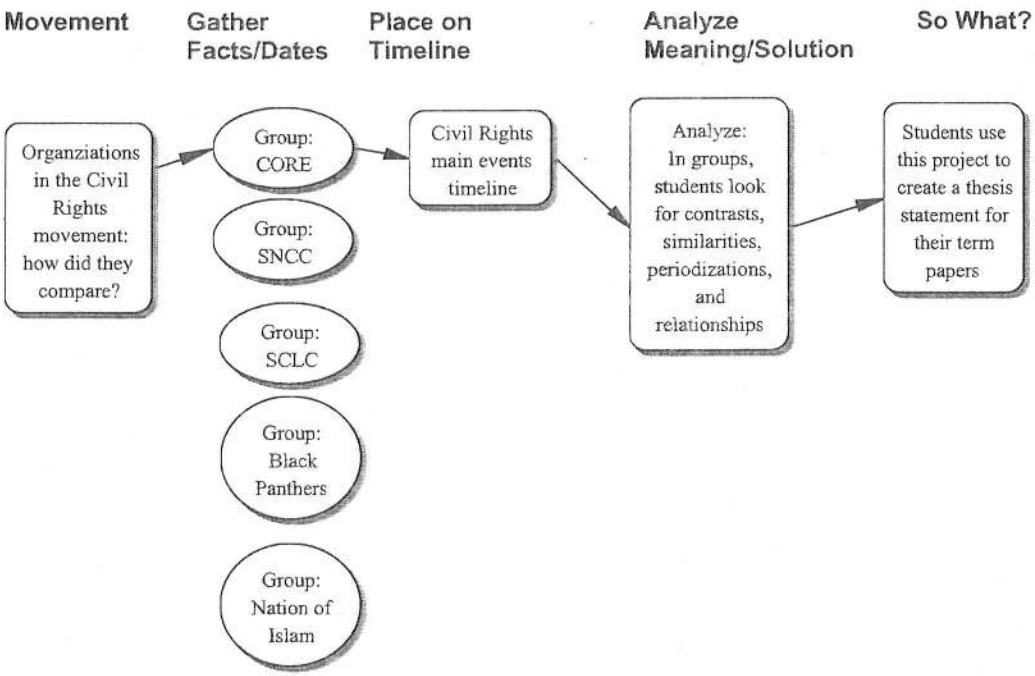
For the reader of these transformations, consider the following questions:

1. How well has the student transformed a low-level learning activity into a higher-level one?
2. What recommendations would you have to make the learning experience better?

Movements: Civil Rights

Old Method: Students would be assigned a paper on the Civil Rights Movement of the post-World War II period. Because there is a lot of information on the Internet on Civil Rights, students would promptly go to the Web and download their workload and many of them would choose the easiest subject. Result: thirty-nine plagiarized papers on Martin Luther King Jr.

Transformation: Timeline Model



Italicized text indicates information literacy components

New Method: **Problem**: How were organizations involve in the Civil Rights movement similar or different, how did the times affect their goals (and what were they?), and what were the outcomes?

Gather Facts and Dates: Students will ***find, select and evaluate information*** and ***determine facts*** about various Civil Rights organizations (CORE, SCLC, SNCC, Nation of Islam, and the Black Panthers) as it relates to the course of the Civil Rights movement.

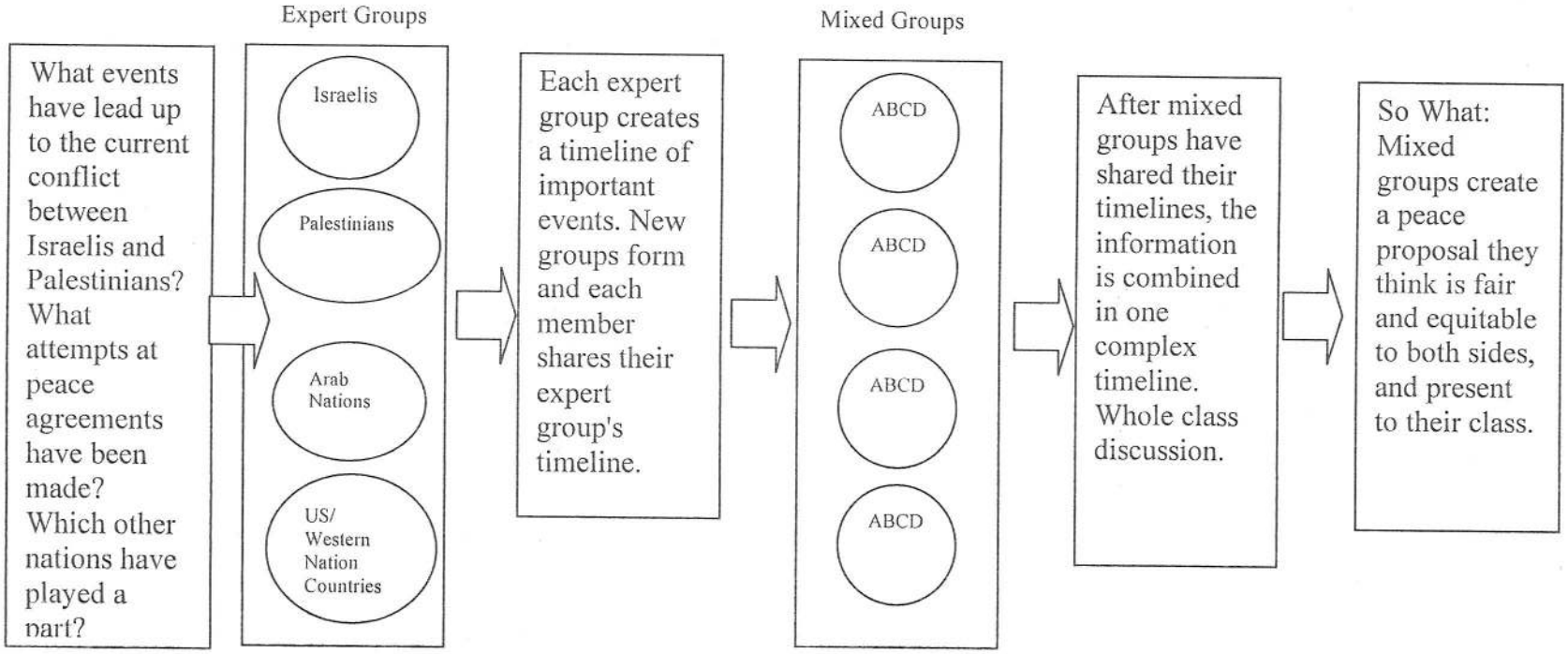
Place Organizations and Events on Timeline: Students will ***sort information***.

Analyze Meaning/Solution: In groups, students will ***compare*** the information to identify patterns, similarities, and periodize the information to show changes in the movement over time. How are all of these related? How are they different? What were their goals? Which group was most important? How did the chronology and region of each group affect its goals? Students will ***identify and investigate patterns and trends.***

So What?: What does this show about overall progress and gains made in Civil Rights? What can we learn from this? Why is it important today? Students will use this background for developing thesis statements for their term papers.

Transformation Three - Time Line Model

Old Lesson: Students are given free time in library to research prepared questions on dittos regarding issues about the Israeli/Palestinians conflict.



Problem: Which groups have played a role and what events have contributed to the current political unrest between the Israelis and the Palestinians? What attempts have been made to negotiate a peace agreement and which other nations have been involved? Students will be assigned to a expert group which will study historical events through the lens of one of the important "players" in the Israeli-Palestinian conflict. Each group will design a timeline from: http://www.readwritethink.org/materials/timeline/index.html. New groups are formed, which contain a member from each of the expert groups to analyze and compare timelines events. All timelines are merged into one complex timeline. Whole class discussion ensues. What patterns/relationships/cause/effect emerge? Mixed groups reconvene to write a peace proposal that they feel will be equitable, and present to their classmates.

State Content Standard: 10.10 Students analyze instances of nation-building in the contemporary world in at least two of the following regions or countries: the Middle East, Africa, Mexico and other parts of Latin America, and China. 1. Understand the challenges in the regions, including their geopolitical, cultural, military, and economic significance and the international relationships in which they are involved. 2. Describe the recent history of the regions, including political divisions and systems, key leaders, religious issues, natural features, resources, and population patterns.

Info Literacy Skills: Actively Read, View and Listen.;Select revelant data; notemaking; collaboration; make timelines; make connections; patterns and trends, synthesize, redesign. Reflect, transfer and apply.

Deborah Long
LIBR 250
July 9, 2005
Transformation#1
Topic: People
The old way: Students research a prominent person (African American History month, authors, scientists, librarians…) and take notes from encyclopedias about the details of the subjects' lives. They then present a summary of this information as an oral report, individually, on several successive class days.
The new way: Mixing timeline model and take a position model. Transformation – Civil Rights Leaders

Timeline Model

Divide students into groups or teams of 4-5 members. Assign one decade to each team.

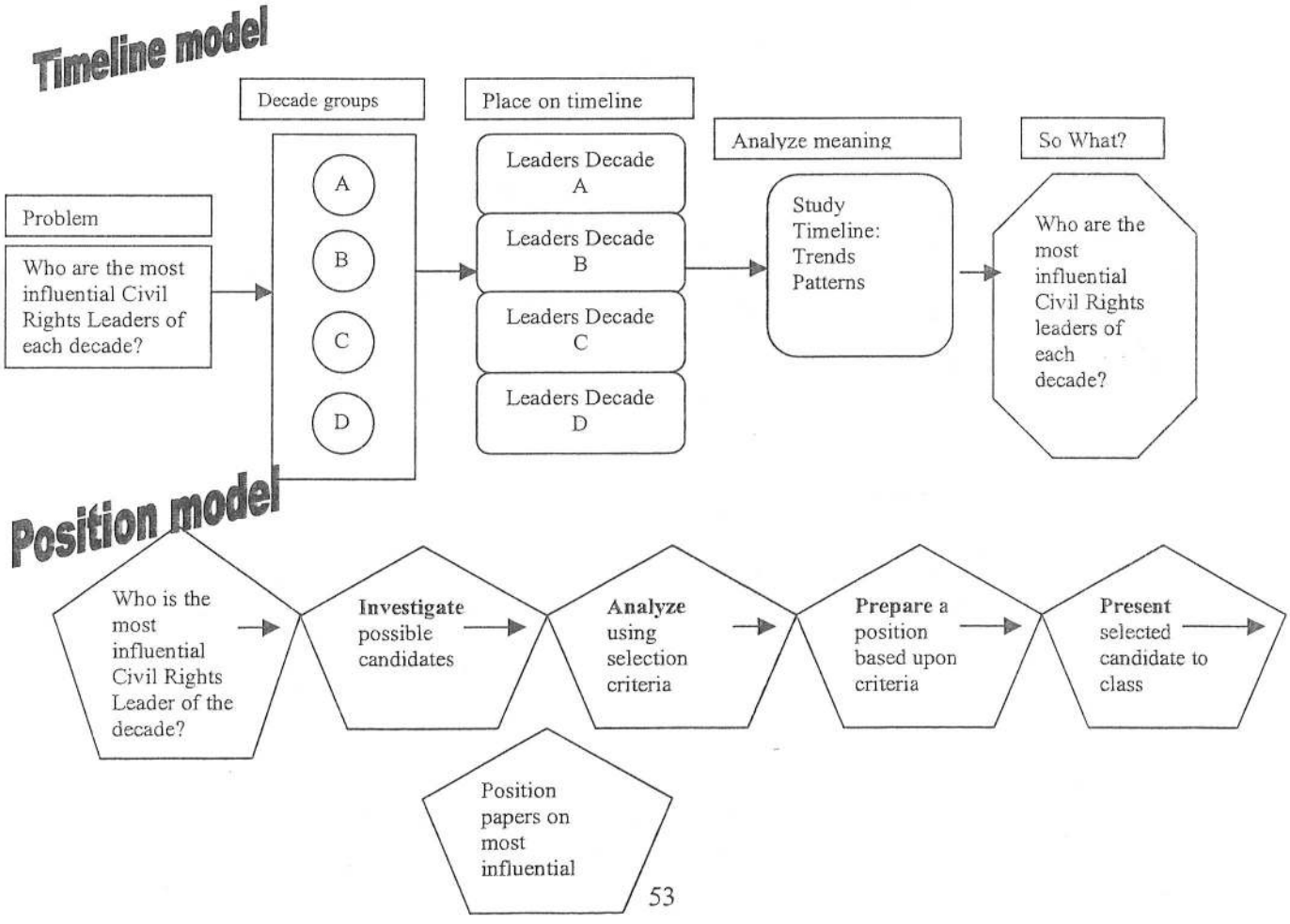
1. Each group member choses a prominent figure from a particular decade to research. (Teacher may have to make suggestions in advance).
2. Groups meet, consult sources and develop a timeline of significant figures and their achievements within each decade.
3. Timelines from all groups are displayed in chronological order.
4. Groups study timeline to determine patterns and trends in civil rights leadership.

Take a position

1. Each group develops criteria for selecting the civil rights leader of the decade.
2. Groups select leaders of the decade based upon criteria. They may need to consult more sources as well.
3. Groups present their selections to the large group in poster or other presentation format including the criteria for selection.
4. Class members write position papers evaluating leaders to choose the most influential civil rights leader in history.

California standards addressed: (Sample only)

History/ Social Science -- Grade 11: 11.10 Students analyze the development of federal civil rights and voting rights.
English/ Language Arts -- Grade 11: Research and Technology 1.6 Develop presentations by using clear research questions and creative and critical research strategies:

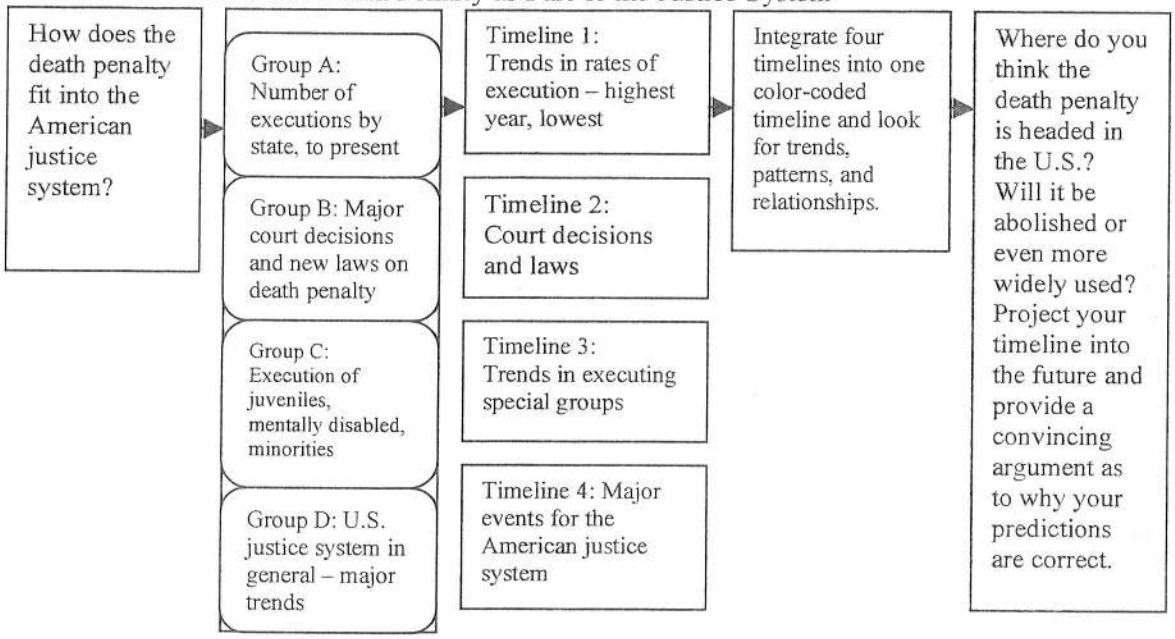


Miranda Doyle

Transformation 7: Systems

Old Way: Students will define capital punishment; discuss the positions for and against the death penalty discussed in the video; write a mock editorial for a Huntsville, Texas, paper to defend or denounce the death penalty. http://school.discovery.com/lessonplans/programs/8thamendment/

The Timeline Model: The Death Penalty as Part of the Justice System

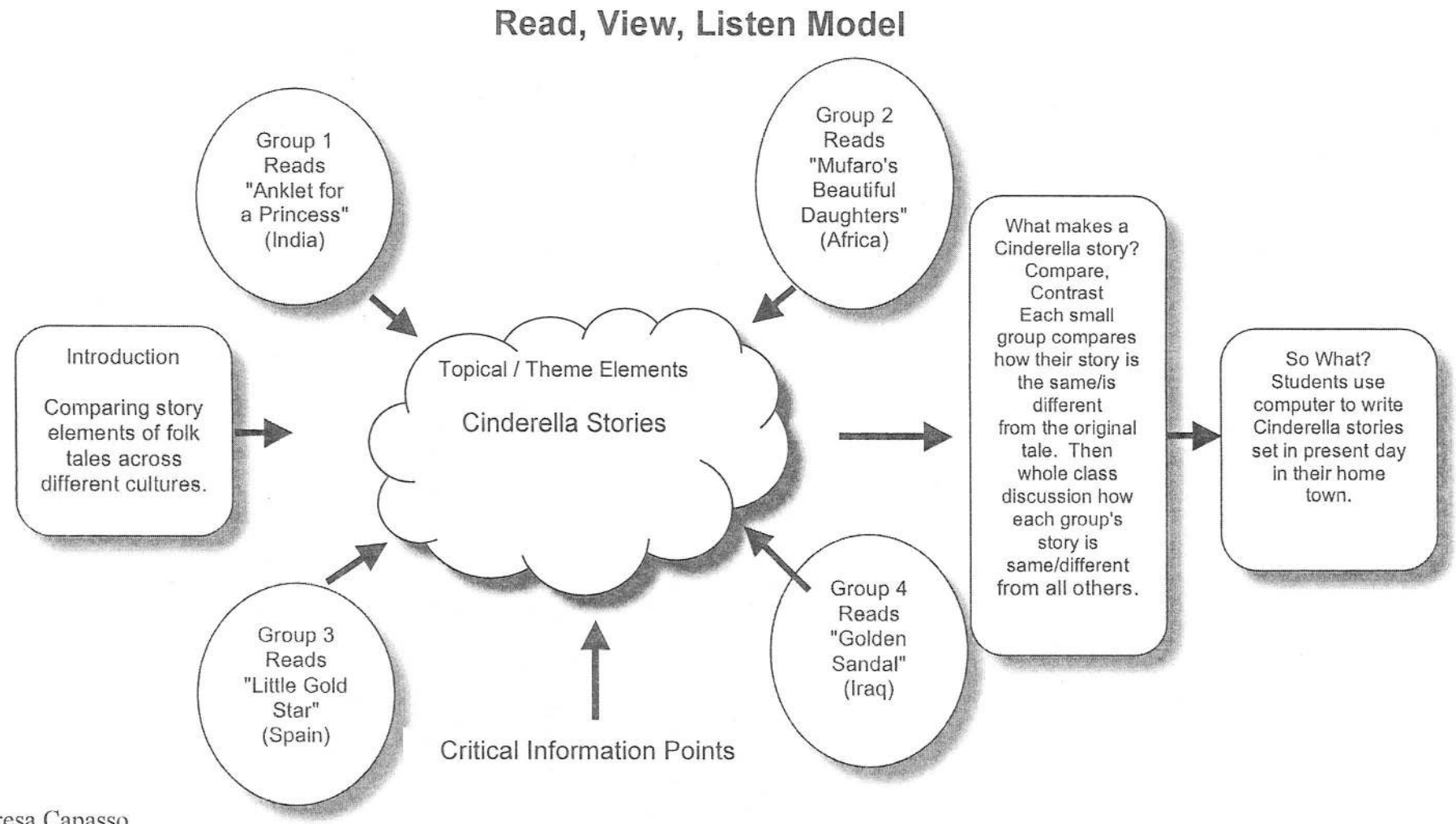


New Way: The class will collaborate to produce a timeline showing the history of the death penalty in the United States. The library media specialist will begin with a mini-lesson on using Inspiration software to create timelines, and also teach about using sources such as the Bureau of Justice Statistics web site (http://www.ojp.usdoj.gov/bjs/welcome.html) for research. In addition, students will learn how to evaluate a web site to determine bias by comparing the "facts" cited on both a pro-death penalty and an anti-death penalty site. Students will then be assigned to groups that will look for important dates and figures for four different topics. Each group will create a timeline, which will then be color coded and merged with the other four timelines to create one product.

The class will then work together to find trends, patterns and relationships on the whole-class timeline. Finally, students will need to use what they have learned to project into the future. They will write individual essays explaining their projections as to whether the death penalty will become a more or less important part of the American justice system in the future. Ideally, this assignment could be done for many aspects of the justice system: police, courts, juvenile justice, prisons, rights of the accused, juries, etc. to create an overall timeline for analysis.

Standards (History-Social Science, Gr. 9-12):
Chronological and Spatial Thinking:

- Students compare the present with the past, evaluating the consequences of past events and decisions and determining the lessons that were learned.
- Students analyze how change happens at different rates at different times; understand that some aspects can change while others remain the same; and understand that change is complicated and affects not only technology and politics but also values and beliefs.



By: Teresa Capasso

Old: Students read a variety of fairy tales and write a book report.

New: Librarian introduces unit by reading the classic Cinderella fairy tale to the class and discussing plot elements, characters, settings, conflict, resolution. Then literature groups are formed to read different Cinderella stories from various cultures. Each small group compares/contrasts their story to classic version, using a graphic organizer listing various elements for comparison. Whole class discussion follows in which elements from all stories are compared/contrasted and recorded on a large chart. Then, in the computer lab, students write their own modern day Cinderella (or Cinderfella) story, set in their hometown

Content Standard: 3.2 Comprehend basic plots of classic fairy tales, myths, folktales, legends, and fables from around the world.

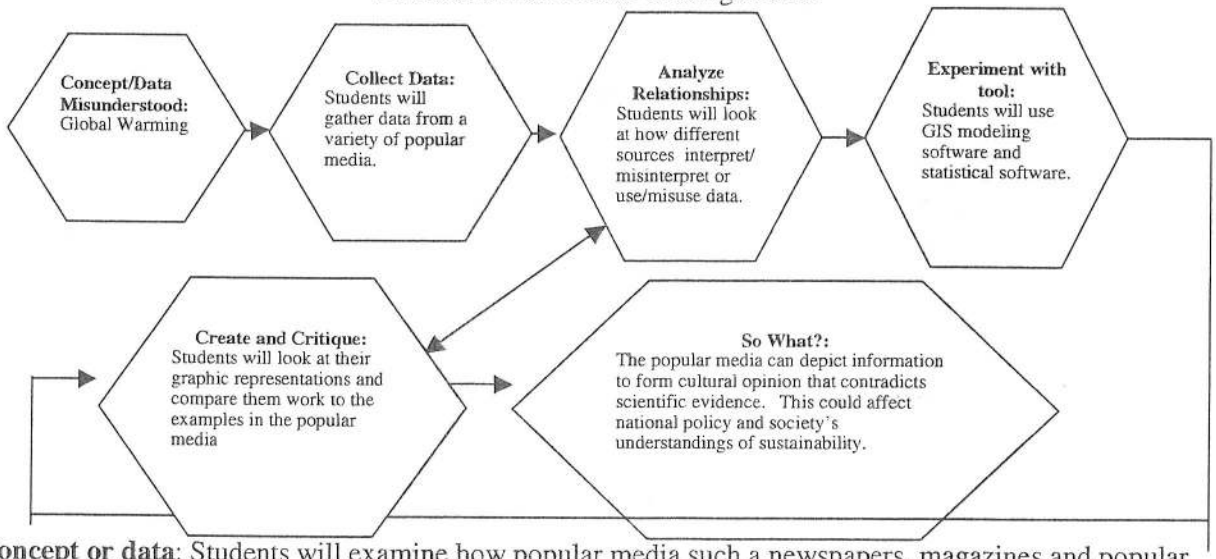
Information Literacy Skills: actively read, view and listen, compare, make connections, synthesis, reflect, transfer, apply.

Sarah Passonneau
LIBR 250-11
Prof. Loertscher
Aug. 8, 2005

Transformation 3: Ideas

Old lesson: Students read a textbook and supporting articles that described statistical analyses of global warming. Students created their own bibliography in an area of global warming they found interesting. They created a graphic presentation summarizing their readings.

Transformation: Sense-making Model



Concept or data: Students will examine how popular media such a newspapers, magazines and popular novels depict scientific data and statistics concerning global warming. They will discover how popular media often misinterprets or misrepresents important facts and figures.

Engaging Question: In groups, students will retrieve a list of newspapers articles, magazine essays, and read excerpts from Michael Crichton's novel State Of Fear. Student will also read critiques of the news media and Crichton's depictions of global warming. They will then find a scientific article that uses graphs, pictures and stats to describe global warming.

Analyze Relationships: Students will examine the differences between popular media and scientific research. They will learn how statistical information can be exaggerated or misunderstood by examining alternative graphs depicting the same data. This lesson builds on students' information literacy skill of evaluating information.

Graphic Tool: In groups, students will take raw data given to them from scientific research and input the date into a geographic information systems (GIS) software package. They will also use the R Statistics Language software to input the same data.

Create: Students will produce graphic examples depicting the same information in different ways. As a class, students will re-think the examples of the popular media and critique the information.

Sharing/So what: The popular media has a great impact on our cultural knowledge. When major issues such as global warming are misrepresented our understanding of sustainability becomes skewed and can effect the formation of cultural assumptions. What critical skills are needed to evaluate the credibility of sources that present statistical data?

Sarah Bosler
LIBR 250
Transformation #4 Event/Movement
August 12, 2005

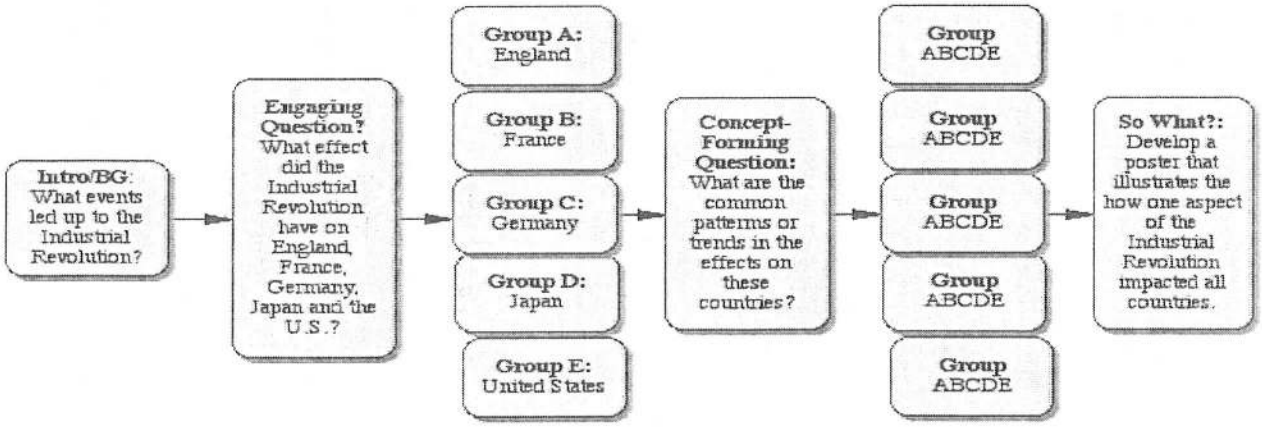
Necessity is the Mother of Invention: The Effects of the Industrial Revolution
Concept Jigsaw Puzzle Model

Old Way: Students research the causes of the Industrial Revolution using Internet and other resources. Write an essay explaining its impact on a particular country.
New Way: Students research the effects of the Industrial Revolution from the perspective of one country and collaborate with other groups to understand the bigger picture.

CA Content Standards: 10th Grade World History
10.3 Students analyze the effects of the Industrial Revolution in England, France, Germany, Japan, and the United States.

1 Analyze why England was the first country to industrialize.
2 Examine how scientific and technological changes and new forms of energy brought about massive social, economic, and cultural change (e.g., the inventions and discoveries of James Watt, Eli Whitney, Henry Bessemer, Louis Pasteur, Thomas Edison).
3 Describe the growth of population, rural to urban migration, and growth of cities associated with the Industrial Revolution.
4 Trace the evolution of work and labor, including the demise of the slave trade and the effects of immigration, mining and manufacturing, division of labor, and the union movement.
5 Understand the connections among natural resources, entrepreneurship, labor, and capital in an industrial economy.
6 Analyze the emergence of capitalism as a dominant economic pattern and the responses to it, including Utopianism, Social Democracy, Socialism, and Communism.
7. Describe the emergence of Romanticism in art and literature (e.g., the poetry of William Blake and William Wordsworth), social criticism (e.g., the novels of Charles Dickens), and the move away from Classicism in Europe.

InfoSkills: Explore a Topic, Develop Questions, Locate Resources, Evaluate Resources, Collaborate



Introduction/Background: What events led up to the Industrial Revolution? Explain England's role reflected in 10.3.1 of the standards. Teacher provides information, brief introduction.
Engaging Question: What effect did the Industrial Revolution have on England, France, Germany, Japan and the U.S.? (Standard 10.3)
Specialist Groups: Students get into groups according to country. They research the effects that the six topics outlined in standards 10.3.2-7 had on their country.
Concept-Forming Question: What are the common patterns or trends in the effects on these countries?
Sharing Groups: Discuss and cluster the common elements. Develop a list of similar effects. Students return to Specialist groups and discuss impact that Industrial Revolution has had on all of these countries.
So What?: Develop a poster that illustrates the how one aspect of the Industrial Revolution impacted all countries.
Extended Activity: What impact has the Internet had on the U.S. economy over the past 10 years?

MATRIX MODEL: ADULT LEARNERS LEARN ABOUT SELECTING STOCKS FOR INVESTMENT

BIRD-UNIT APPROACH--As part of a series on stock investing held in the public library's community meeting space, an expert presenter, a stock broker, discusses and reviews various approaches to selecting stocks for investment. At the end of the program, the presenter distributes a pathfinder about stock market investing that was compiled by a librarian.

MATRIX MODEL TRANSFORMATION WITH DECISION-MAKING ASPECT

PROBLEM / ISSUE

How do you gather, organize, and examine data in order to decide upon whether or not to pick a stock for investment?

GROUPS

- TECH STOCK
- BANK STOCK
- RETAIL STOCK
- HEALTH STOCK

SUBJECT	TRAITS			
	Fundamental Factors Value/Growth/Income/Quality	Quantitative Factors—market cap., revenues, momentum	Chart-Oriented Factors (CANSLIM charts)	DECISION: BUY, SELL, OR HOLD?
a technology stock				
a banking stock				
a retail stock				
a healthcare stock				

ANALYZE DATA: After each group records its stock data, the presenter facilitates a discussion with all participants to interpret the data, determine whether or not each stock should be selected for investment, and explore arguments for and against using each set of factors (alone or in combination) in making a stock investment decision.

SO WHAT? How, if at all, has the exercise influenced your ideas about the efficacy of having a decision-making plan or approach when selecting a stock? Which factors or sets of factors will you use as an investor?

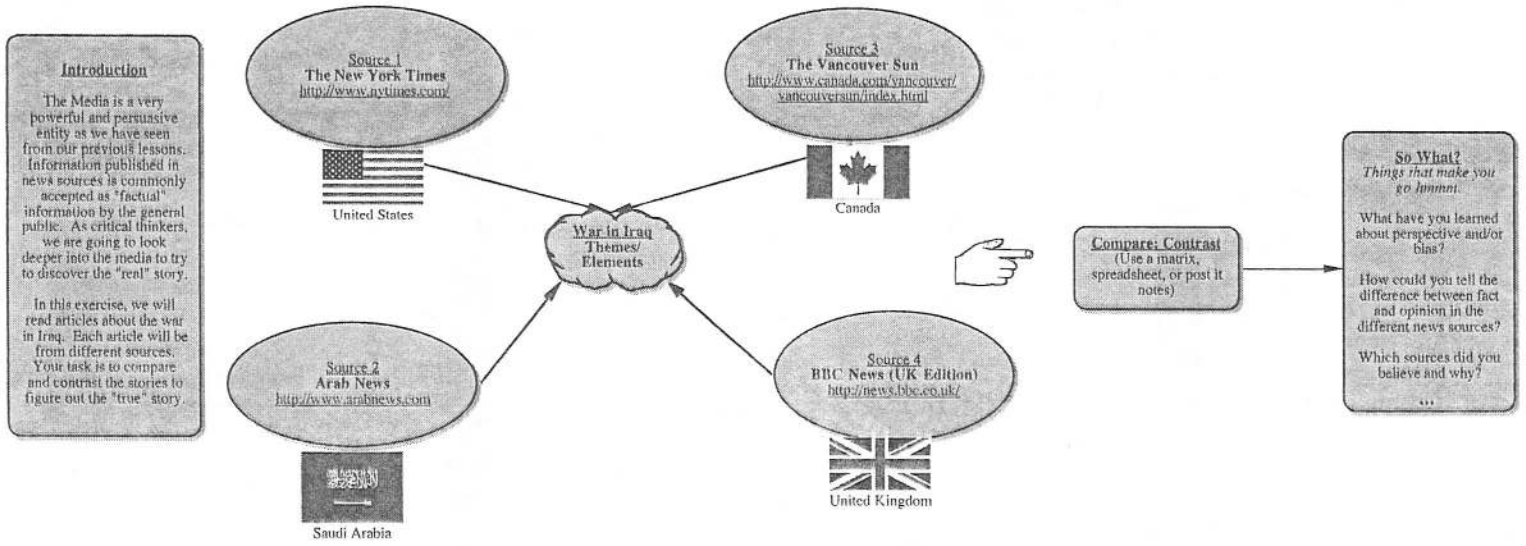
Information Literacy Aspects: *Examine patterns, trends; compare/contrast, explore what-if scenarios.*

Introduce learners to making stock investment decisions based upon interpreting data from sound sources. Use a pathfinder about stock analysis sources, conduct independent and guided searches of library resources to locate data in primary sources including annual reports, reference materials, newsletters, and relevant electronic resources.

IRAQ: What is really happening according to the media?

By Keisa Williams

The Read, View, Listen Model



Old Version: Text book lesson and lecture about bias and the media. Common lessons include writing a paper about the difference between fact and opinion and describing bias in the media.

New Version: A more dynamic lesson that involves internet searching and information literacy research skills. This allows students to experience many literary/written works rather than relying on a single text. Groups can present their findings to the class and the actual finished product can be viewed in the matrix.

Critical Information Literacy Skills: "Skim, Scan, and Consider", "Pre-Reading Strategies", "Active Reading", "View and Listen", and "Picture Reading".

National Standards:

This activity meets the following standards sanctioned by NCTE that apply to journalism education:

Standard 1: Students read a wide range of print and nonprint texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information, to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.

Standard 7: Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purposes and audience.

Standard 8: Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

Standard 11: Students participate as knowledgeable, reflective, creative, and critical members of a variety of literacy communities.

Standard 12: Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

Original Lesson: Students recieve direct instruction on concepts of longitude & latitude, complete worksheet using maps. Given test.

Sense Making Model Transformation: The Why of Longitude & Latitude: Find the Mystery Country!

The Problem

1. Students will use the concepts of longitude & latitude to locate & create maps of different countries on the computer.

1 A. Teacher introduces concepts of latitude & longitude to class using print & LCD projected visual aids.

2 A. Students are given the names of 4 countries.
B. In pairs, students move from stations set up with a variety of World Atlases, & computer stations set to the Xpeditions Atlas website.
C. Students are instructed to find the northernmost & southermost latitudes & easternmost & westernmost longitudes bordering each country.
D. Pairs rotate finding coordinates of each country, each from a different source.

Gather Data

3 A. LMT instructs students on the use of Online Map Creation Input Form using LCD Projector & printout of How To Use directions.

Analyze Relationships

4 A. In pairs, students enter the longitude & latitudes of the countries into OMC program to create maps based on the data they have gathered. Relationship of coordinates must be correct to produce map of the country.

Create & Critique

5 A. If not coordinates are not correct, students return to map or website to attempt a more accurate reading.

Experiment with Tools

6 B. Students attempt to solve Xpeditions Crack the Code activity. (Game involves having to successfully locate countries on a map using coordinates.

Critical Information Literacy Skills: Actively Read, View, Listen; Use Organizers; Sort; Compare; Classify.

So What?

A. In class discussion, students brainstorm a list of situations in which it might be helpful to know your latitude & longitude.
B. Students create their own quizzes to have classmates locate mystery places using the OMC Input Form .

Robin Fosdick
LIBR250: Design and Implementation of Instructional Strategies
Assignment One – Transformation #7 (Systems)

Topic: Food Chains and Ecosystems, Grade 4

Original Lesson Plan:
To learn about food chains and ecosystems, each student picks a particular animal and researches its place in the food chain, relationship to other animals, etc. and writes a paper summarizing his findings.

New Lesson Plan:
Students browse books, articles, and web sites about ecosystems and food chains to find out 1) what they are and 2) get an idea of what kind of relationships might exist within an ecosystem/food chain.

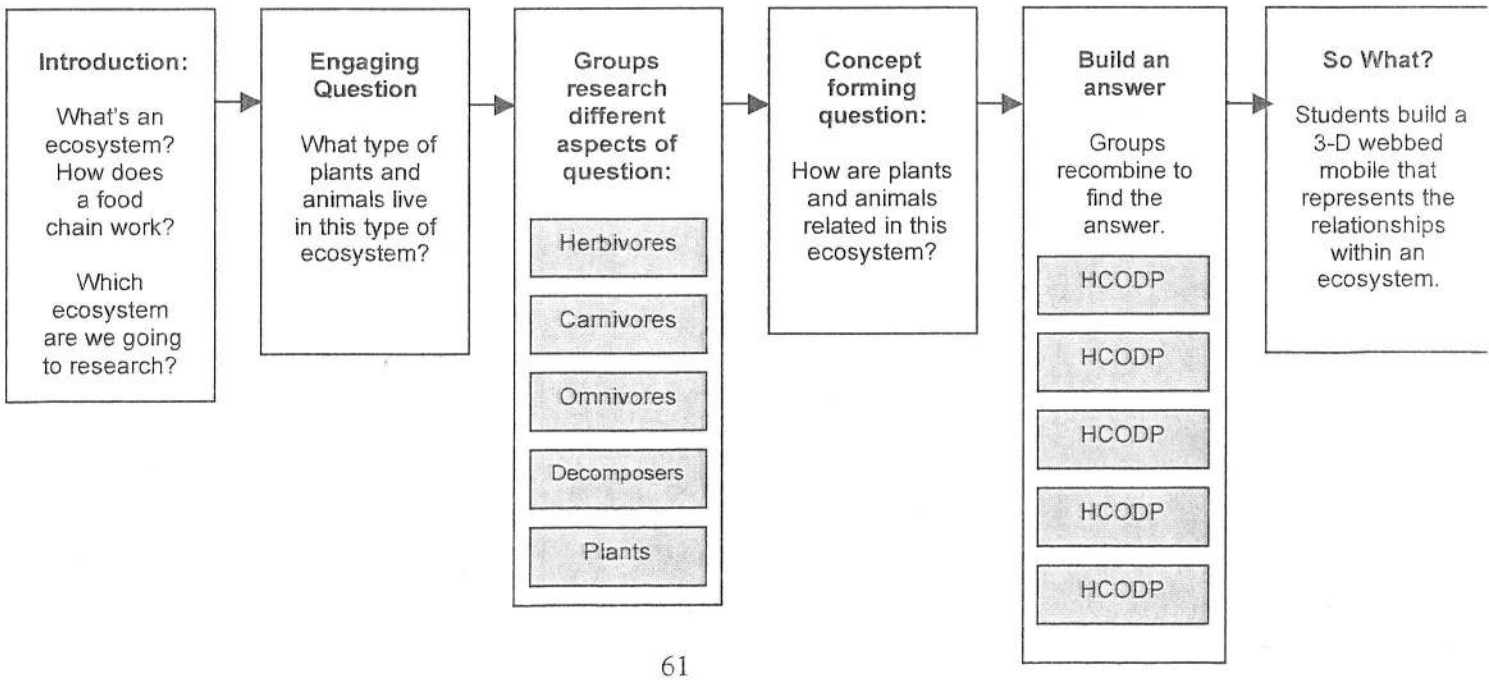
Class then votes on which particular type of ecosystem they'll explore for this project.

Question #1: What types of plants and animals live in this ecosystem?
To answer this question, students are divided into 5 groups: herbivores, carnivores, omnivores, decomposers, and plants. Each groups researches its organism and develops an understanding of what the animal eats (plants or other animals – which ones?), what other animals prey on it, and if the organism has any special relationships with other plants or animals that are necessary for its survival.

Question #2: How are plants and animals related in this ecosystem?
To answer this question, the groups are recombined into new groups; the new groups then combine their knowledge and work to build an answer.

So What:
To demonstrate their new knowledge, the students build a three dimensional webbed model representing the relationships in this ecosystem. Each organism in the ecosystem will be represented in the model, with different levels (top to bottom) and strings between organisms indicating food chain relationships

Concept Jigsaw Model:



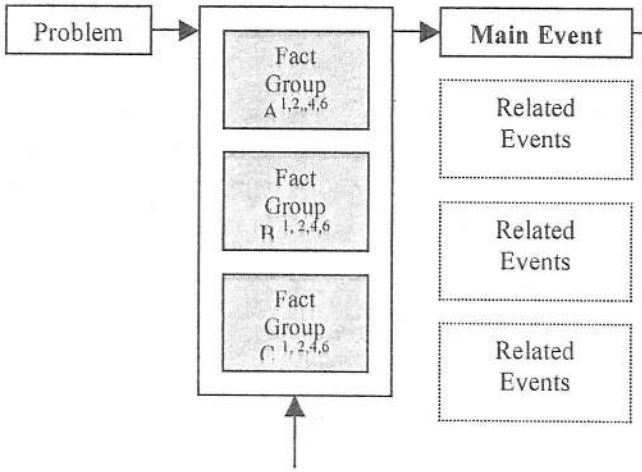
Bridget Kowalczyk

SYSTEM TRANSFORMATION - HEALTHCARE ORGANIZATIONS

Bird Unit: Write a paper of 7-10 pages in length that highlights a specific event or situation in the history of healthcare delivery in the U.S.

GRADE: College, upper division, Course: Healthcare Organization & Management

Transformation: The Timeline Model



Study Timeline:[3,5]
Trends / Patterns / Relationships / Discrepancies / Surprises

So What?[6]

Problem Healthcare delivery does not occur in a vacuum. The ability to give high level care is directly affected by external as well as interal factors. The organizational structure itself affects the institution's approach to the handling of these issues.

Gathering Facts Students work in 3 large groups (7-10 members) to examine the history of healthcare delivered by three different types of healthcare organizations (Groups A, B, C) in relation to the following healthcare issues: disease trends, environmental factors, political or legislative events, economic or financial factors, health insurance development, clinical & professional training, human resources development or legal factors. Each group member is responsible for tracing one of the health care issues and how their type of organization has delivered healthcare in relation to it – identifying trends, patterns, relationships, discrepancies, and surprises. Note taking should be accurate, citations should be complete.
The 3 types of organizations: **Group A: Medical office practices** **Group B: Hospitals** **Group C: long term healthcare facilities**

Placement on the Timeline The class will create one timeline. It will be quite large, so it is recommended that poster-sized "post it" notes are used on the walls of the classroom to construct the timeline. As the groups add their information to the timeline, trends and relationships should become visually evident. One member from each group gives a short oral presentation tracing their findings.

Analysis During the analysis, students revisit the originally stated problem, with a focus on all the stakeholders impacted by the events. Discoveries should be recorded in their notebooks and used to create 3 - one page reflections on the historical trends in the delivery of health care by each type of organization.

So What? Strategies for improving access to health care and health care delivery are discussed. Students return to their original groups and create an outline of a strategic plan for their organization.

Information Literacy Skills:
1. Actively Read, View, & Listen
2. Select Relevant Data
3. Sort
4. Note Making
5. Identify and Investigate Patterns and Trends
6. Collaboration

Bridget Kowalczyk

SYSTEM TRANSFORMATION - HEALTHCARE ORGANIZATIONS

Questions to Ask about Transformation

1. What's the BIG PICTURE I want the students to get?*
   - Students will be able to articulate an understanding of the political, historical, social, and economic factors that have affected and continue to affect the healthcare delivery system.
   - Students will be able to recognize the various components of the healthcare delivery system including the integration of these components as well as various mechanisms of the delivery of care.
   - Students will be able to understand the relationships and trends of the participants, both organizationally and professionally, within the components of healthcare delivery and the environment in which they function.
   - Students will begin to understand how they, as the future leaders in healthcare organizations, can be strong decision makers and problem solvers.

2. What PRODUCT will I have students produce to show they "get it?"
   - Students create a Timeline highlighting trends and changes in healthcare delivery by three different types of organizations in relation to healthcare issues.
   - Students record their findings in their Notebook Organizers.
   - Students write three one-page reflections after analyzing the timeline for patterns, trends, relationships, discrepancies, and surprises.
   - In groups students collaborate to write the outline of a strategic plan for their type of organization.

3. What CHARACTERISTICS of my group do I need to consider in designing the final product?
   - Define Group: Students interested in careers in health care administration.

4. What SKILLS will I need to help STUDENTS build in order to be successful in this unit?
   Information Literacy Skills infused into this assignment include:
   - Actively Read, View, & Listen
   - Select Relevant Data
   - Sort
   - Note Making
   - Identify and Investigate Patterns and Trends

*The Big Picture for this assignment is based on the actual Course Objectives listed by the instructor in their syllabus, Dr. Patricia Minors, Western Kentucky University

Literacy Inservice

By Deborah Long

The old way: Administrator summarizes research on ssr and reads a series of Power Point slides to the group.

The new way: Use concept jigsaw technique to allow teachers to practice reciprocal teaching while reviewing the research on sustained silent reading.

Essential Questions:

1. How does reciprocal teaching help students practice the techniques that good readers use?
2. What is the rationale for and value of sustained silent reading programs?

Goals and Objectives

1. Introduce a reading improvement strategy for content areas (reciprocal teaching).
2. Model a teaching technique (concept jigsaw)
3. Remind teachers of the rationale for SSR and suggest strategies and resources.

Procedures

Part I: Reciprocal teaching and concept jigsaw

1. Brainstorm with teachers to create a list of what good readers do when they read (possible responses: make predictions, draw conclusions, ask themselves questions, visualize)
2. Explain the 5 parts of reciprocal teaching (predicting, asking questions, clarifying, visualizing and summarizing) using a handout that briefly describes each part.
3. Group activity (Concept jigsaw)
    a. Divide teachers into 5 (or 10) groups. Each group takes one reciprocal teaching role and completes it with SSR passage entitled, "A Survey of Sustained Silent Reading Practices in Seventh-Grade Classrooms" by Nancy M. Nagy, C. Estelle Campenni, and Janet N. Shaw. That is, all members of the group will summarize, or clarify etc. They will record their group's work on a reciprocal teaching chart.
    b. Jigsaw groups so that all groups have one person for each reciprocal teaching role (5 group members: 1 for summarizing, 1 for questioning, 1 for visualizing, 1 for clarifying, and 1 for predicting). Each group will be able to see the entire reciprocal teaching model and record it on their charts. Group members share their responses with one another.
    c. At the conclusion of the jigsaw groups, refer teachers back to the list made at the beginning of the session in which they described what good readers do when they read. Discuss the essential question: How does Reciprocal Teaching require students to do what good readers do? Mark the list as appropriate. Teacher should then be able to see that Reciprocal Teaching helps students demonstrate many of the behaviors of good readers.

Part II: SSR

1. Discuss the following questions: What did you learn about the rationale for SSR from the article used in the reciprocal teaching exercise? (Possible answer: That SSR has been show to increase interest and motivation that in turn leads to greater reading practice and ultimately higher student achievement).
2. Provide a list of Marzano's characteristics for successful SSR and review the procedures and characteristics with teachers.
3. Provide teachers with simple reading logs and accountability strategies to help them use SSR time effectively.

Additional Sources:

Newman, Terry. "Accountability Strategies for Reading." *Schools in the Middle*. Jan. 2000, 30-32.

Burke, Jim. *School Smarts: The Four C's of Academic Success*. Portsmouth, NH: Heinemann, 2005.

Beers, Kylene. *When Kids Can't Read What Teachers Can Do*. Portsmouth, NH: Heinemann, 2003.

Deborah Long
LIBR 250
August 5, 2005
Transformation #7
Topic: Systems
The old way: The principal makes a general announcement about trash left after lunch. Administrators patrol campus after lunch and ask students to pick up trash. If it doesn't get cleaned up, either the custodians find time to do it, or the school is left littered.
The new way: Building a Better Way Model

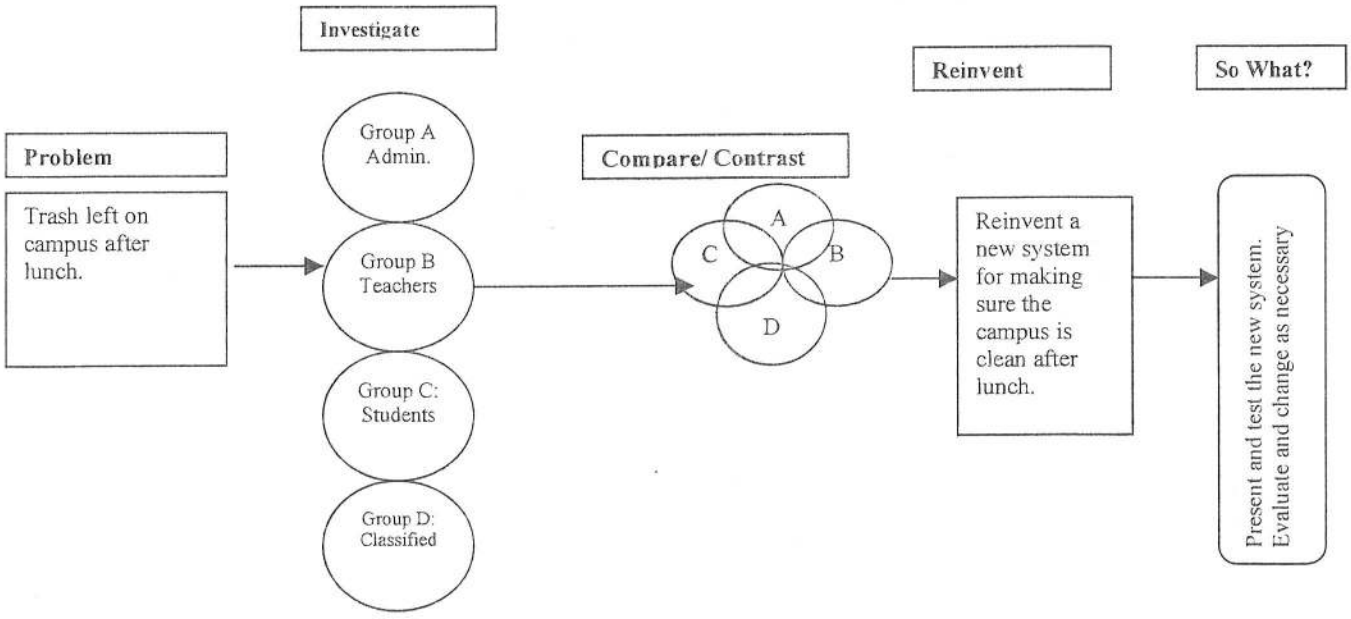
Transformation – Cleaning up the Campus after lunch

Essential Question: What is a better way to make sure the campus is clean after lunch?

1. Divide students into groups. Assign each group to interview stakeholders (administrators, teachers, students, custodians) (IL skill: Primary Resources)
2. Groups develop questions and note taking instruments designed to get input from their group of stakeholders. (IL skill: Sort and take notes)
3. Whole class discussion to determine what questions will be asked of all groups so that data is consistent. (IL skill: Make connections; Synthesize)
4. Class designs interview and note taking instruments (IL skill: use organizers) and conduct interviews. Groups also consult information sources to find out how this problem is solved in other schools.
5. Groups study the responses of various stakeholders to find differences and similarities. (IL skill: Make connections)
6. Groups put summary of data on classwide chart so that opinions of all stakeholders are represented (IL skill: Synthesize)
7. Class designs a program for clean up based on input from stakeholders and other information sources.
8. Class develops an appropriate persuasive presentation (Powerpoint, data charts) and presents new program to the principal for his/her approval. Class helps to implement the new system. (IL skill: Reflect; Transfer and apply)
9. Class designs an evaluation tool to give to stakeholders after the new system is in place. Class makes changes to system as required.

California standards addressed: (Sample only)
ELA: Grades 9,10: Writing Strategies -- *Research and Technology* 1.3 Use clear research questions and suitable research methods (e.g., library, electronic media, personal interview) to elicit and present evidence from primary and secondary sources.

Build a Better Way

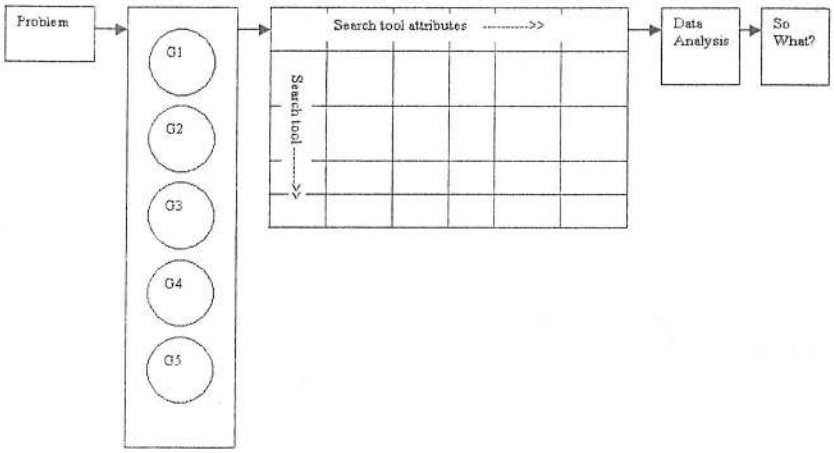


Allen Kesinger
LIBR 250-11
Prof. Loertscher
July 11, 2005

Transformation 3: Ideas or Issues

Old Model: The lesson required students to investigate online information websites, search engines, meta-search engines and directory sites. Students are required to report on selected search tools through worksheets that asked questions that needed "cut and paste" answers.

Transformation: Matrix Model



Problem: It is important to use the best possible search tool to fulfill a specific information need. With so many search tools available, which is the best to use?

Subject Groups: The classroom would be divided into groups of two to three students who would choose a specific search tool and research it to report on its specific attributes (use of spiders, ads, Boolean, etc).

Matrix/Data Entry:

	Ads	Boolean	Spiders	Truncation	etc...
Yahoo!					
Google					
Metacrawler					
Etc...					

Data Analysis: Based on the data entered in the matrix, the class can make a collective decision on what search tool would be best for a specific information need. Review Problem for discussion based on results.

So What? Students develop a higher knowledge of information search tools that will benefit the research process and develop information literacy.

Transformations

Various School Library Media Professionals

Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Transformation of a Bird Unit Description Form

Name, address, phone number and email address:

Sarah Renard, LMS and Spencer Hill, World History Teacher
Highland High School
P.O. Box 419
Hardy, AR 72542

Unit title and grade level: Daily Life in the Middle Ages/Sophomores

One/two sentence Description of the Old Method: After studying about the Middle Ages in the classroom using the textbook, students came to the library for 2-3 days. Students created PowerPoint presentations using Internet sources (the old cut and paste method), and presented (read) them to the class.

Description of the Transformation:

This unit follows most of the Background to Question Model, but has some elements of the Read, View, Listen Model and possibly the Sensemaking Model.

A cart of 68 books was kept in the classroom during the three weeks of the classroom study. Books included fiction and non-fiction choices that all dealt with some aspect of the Middle Ages. Students were required to read 15 minutes daily and keep a reading log with brief descriptions of interesting details and their page numbers. After the unit test, students were surveyed to determine the areas of their greatest interest. They were put in groups of 4 with others who shared their interest. They came to the library for the next 8 days.

They were given lists of suggested activities for group projects for their individual interest areas. All groups had to use at least one of the books from the cart as a resource for their project, and they had to be prepared to justify their choice. Students were also allowed to use reference books, ebooks, and Internet sites as sources for their project, as long as they cited their sources. We discussed with the students the rubrics we would be using to evaluate them before they started. Groups were NOT allowed to make a PowerPoint presentation as their project. Rather, they had to create something visual to show the class and be prepared to talk about it. Students had special "thought" questions given them as part of their instructions for the suggested activities, and they had to be prepared to answer those questions during the oral presentation to the class. They also had to identify and answer three questions they created which they felt were important questions to answer in order to understand what daily life was like in the Middle Ages.

We had seven groups: Castles (made a model of one), Religion (made a model of a cathedral), Clothing (gave a fashion show with 3 costumes), Weapons (made samples from cardboard), Music (made sample instruments from cardboard and wood and played audio files), and two Knights groups (one made a coat of arms on shields and the other made a suit of armor). The students *loved* this unit. Some liked the reading less than others, but it was obvious that they *learned*. They were very much engaged during the 6 days of project development, and four of the groups came into the library during other hours or after school to spend additional time working on their projects. Their presentations were absolutely amazing. Each member was able to articulate what their project was about, details of it, and answer thought questions.

Evaluation Form of a Ban Those Bird Units Transformation

Title of Unit: Daily Life in the Middle Ages

Grade Level: _____8–10_____ This unit done collaboratively with __1___ # of teachers

Contact information including email address of the LMS:

Sarah Renard Phone: 870-856-2165 Email: srenard@hland.ncsc.k12.ar.us

In a brief conference between the LMS and teachers, rate the following:

1. This collaboration produced: Less learning Similar results (More learning) than its previous counterpart (circle one)
2. This collaboration took: less time Similar time More time (Much more time) to plan, execute and evaluate (circle one)
3. This learning experience emphasized higher-level thinking and understanding: (Agree) Disagree (circle one)
4. This collaboration encouraged both partners to collaborate: (More) Less in the future. (circle one)
5. As a team, we would like to teach this unit again: (About the Same) With Modification Using a Different Model (circle one)
6. Collaborative learning experiences like this one would help students score higher on academic achievement tests: (Agree) Disagree Not sure (cirle one)

What assessment did both partners use to answer the questions above?

(Joint Rubrics) Other assessments (Observation) (circle all that apply)

Please describe the assessment briefly: We used rubrics to grade the students' participation in the group work and the presentations' content, visual construct, source citation, and answers to questions. Also, students used a peer evaluation rubric on their group members that counted as 1/4 of their grade.

Transformation of a Bird Unit Description Form

Deborah Own, Library Teacher, dowen@nrsd.net, 978-365-4558 x3147
Cece Sullivan, Spanish Teacher, csullivan@nrsd.net
Luther Burbank Middle School, 1 Hollywood Dr., Lancaster, MA 01523

Unit Title: "Bienvenidos!" Grade 8

One/two sentence description of old method: In the past, the Spanish 1 students in grade 8 were required to research a Spanish-speaking country. This research consisted of finding out the basic facts about the country and presenting them to the class.

Description of the Transformation:

We used the Quest Model. We used the Inquiry Module template presented to several members of our Mass. School Library Assoc. last summer by the Baltimore County Public Schools. Instead of asking the students simply to find out as series of facts about their chosen Spanish-speaking country, we presented them with the essential question: How could you "market" a country in order to increase business and tourism and thereby promote its economic growth? This quest can be found at http://burband.nrsd.net/librinfo/Library%20Home/Templates/Bienvenidos.dwt and is based on "Welcome to Europe" found at http://www.beps.org/offices/lis/models/europe/index.html.

Students selected their countries and were put into groups of 2-3 during their Spanish class time, but we introduced each class to the project in the library as a two-teacher team, but putting up the webquest on an LCD projector. In each class, we encouraged the students to think of several subsidiary questions that they might wish to consider and asked them to write them down. In the online webquest we provided the students with a number of reputable country sites as well as a number of books about each country. The students were required to fill out a checklist as they worked, gathering information about various aspects of the country that could help them decide how to market the country to prospective travelers and residents.

They had several options for products. They could create a poster, a pamphlet, or a PowerPoint presentation (although all students had to make an oral presentation of some sort). In terms of self-assessment, the students were required to fill in a summative self-assessment rubric focusing on planning, gathering, sorting, and synthesizing. The teacher and librarian filled out the same rubric for each student. There was also a separate evaluation rubric for each of the products. We provided the students with the use of a citation tool (NoodleBib) to keep track of their sources for their bibliographies. They were required to use one print source, one online encyclopedia (CultureGrams, Grolier Encyclopedias, or Facts for Learning), and one reputable website, for which they were required to submit a brief evaluation form.

The final product also included a teacher-approved 5-question quiz for the class, emphasizing what the presenting students felt were the most important things to know about their country. This helped the students who were listening stay focused on the presentations.

The interesting thing about the presentations was that most of the students didn't "get it"! Most of them were still "bird unit" presentations! We kept hearing about "the population of Brazil is..." and "the major industry of Chile is..." There were only a few groups that really made an effort to try to encourage tourism and business. In order to help them move out of the "bird unit" mentality, these are several proposed modifications for next year's unit:

- Require students to dress up and act as travel agents so that they are more interested in the subject, and it's more interesting for the audience.
- Supply examples of exemplary work (projects); we can use some of this year's projects to show next year's students.
- Post the essential question in both the classroom and the library!
- Have students write a one-paragraph summary telling us why they want to travel to this country after doing the research.
- When introducing the unit, have students "walk through" the lesson online together (more interactive: less teacher-directed).
- Cut down on the checklist of facts they should include in their research (these were intended to help them find the facts they would need to answer the essential question, but there were probably too many of them.

In short, we don't really know why they turned a critical-thinking exercise into a bird unit; we suspect that it is because that is the type of project with which they are most familiar! We hope to make enough modifications in the future in order to help them understand the assignment better.

Evaluation Form of a Ban Those Bird Units Transformation

Title of Unit: Bienvenidos!

Grade Level: _____8_____ This unit done collaboratively with ___2__ teachers

Contact information including email address of the LMS:
Deborah Owen, Library Teacher, dowen@nrsd.net, 978-365-4558 x3147
Cece Sullivan, Spanish Teacher, csullivan@nrsd.net
Luther Burbank Middle School, 1 Holliwood Dr., Lancaster MA 01523
In a brief conference between the LMS and teachers, rate the following:

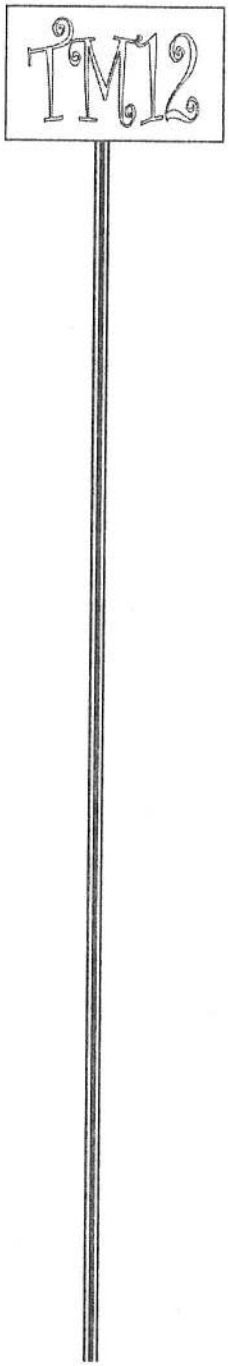
1. This collaboration produced: Less learning Similar results (More learning) than its previous counterpart (circle one)
2. This collaboration took: less time Similar time (More time) Much more time to plan, execute and evaluate (circle one)
3. This learning experience emphasized higher-level thinking and understanding: (Agree) Disagree (circle one)
4. This collaboration encouraged both partners to collaborate: (More) Less in the future. (circle one)
5. As a team, we would like to teach this unit again: About the Same (With) (Modification) Using a Different Model (circle one)
6. Collaborative learning experiences like this one would help students score higher on academic achievement tests: (Agree) Disagree Not sure (cirle one)

What assessment did both partners use to answer the questions above?

(Joint Rubrics) Other assessments (Observation) (circle all that apply)

Please describe the assessment briefly: We met several times, both as the project was in process and near the end. We discussed how we were frustrated that so many of the students focused on the facts, and not the critical-thinking aspect that we had envisioned. Mrs. Sullivan took our frustrations to her Skillful Teacher course and asked for feedback from the other class participants; they encouraged us to post the essential question prominently and have students write a summary about why they would like to travel to that country. Next week we will also fill out a collaboration assessment tool developed by Mrs. Owen for her records.

Please send this sheet along with the transformation description to: David V. Loertscher, 312 South 1000 East, Salt Lake City UT 84102.

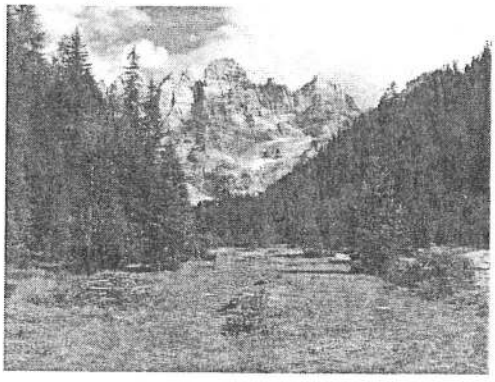


Severe Weather Preparation

A Seminal Collaborative Event

Sara Elizabeth Wolf
Auburn University

Tamara M. Jordan
Phenix City Schools



Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Severe Weather Preparation: A Seminal Collaborative Event

Abstract

The authors present an account of a seminal collaborative planning project between a novice library media specialist and an experienced teacher. Though the unit was successful, both the library media specialist and classroom teacher identified modifications for future collaborative projects. These modifications include establishing more well-defined role expectations for the adults, altering the activity schedule to allow students more time for independent work on proofreading and editing, and providing the students a more explicit explanation of the rationale behind citation of sources. The success of this unit provides additional support for prior recommendations regarding flexible scheduling of the library media program and the value of collaboration between library media specialists and classroom teachers.

Introduction

During the school year, following the tsunami tragedy of 2004, 18 third-graders were presented with the following two stories.

> In Hawaii, there was a teacher who noticed the water in the ocean seemed to be going far away from the beach. She and her students went to the water's edge in order to examine the aquatic life that had been revealed. Tragically, the teacher and her entire class were killed when the associated tsunami returned to the shore before they could escape. (See related information at: http://nees.oregonstate.edu/IT/info/Laupahoehoe.htm, http://starbulletin.com/96/04/01/news/story3.html, or http://www.ghosttowns.com/states/hi/laupahoehoe.html)
>
> In Phuket, Thailand a British school girl noticed the water in the ocean near where her family was vacationing was receding from the beach very quickly. She had recently studied tsunamis in school, and knew to warn her family to run for safety on higher ground. Her quick actions managed to save their lives as well as the lives of 100 other tourists. (See the complete story on the National Geographic News website: http://news.nationalgeographic.com/news/2005/01/0118_050118_tsunami_geography_lesson.html)

The library media specialist (LMS) telling these stories had been faced with figuring out how to convince a group of 18 third graders at the end of a long year to be interested in doing research on "Severe Weather Preparedness." So, she told them these stories, grabbed their attention, and told them, "Someday, I'll be an old woman and won't know how to be safe in severe weather. I'm counting on you to help me if I need it." The LMS and the students' classroom teacher had embarked on a collaborative research unit on the topic of "Severe Weather Preparedness." This topic is a part of the third grade course of study and one that many students found to be exciting to study. This article will provide library media specialists who are new to collaboration an account of the experiences of a novice collaborator. The authors aim is to provide motivation, guidance, and reassurance to library media specialists who seek to collaborate with classroom teachers.

Participants and Setting

The LMS and Teacher. The LMS is new to the library media profession, having more than ten years' experience in teaching elementary students. She is in her second year as the LMS at this

school. Currently, the LMS is completing state certification requirements for her library media certificate. The teacher is in her third year of teaching third grade after teaching fourth grade for four years. Her faculty selected her as teacher of the year prior to the year this collaboration took place. Both the teacher and the LMS are relatively new to formal collaborative processes for curriculum development. However, they entered into this collaborative activity with positive attitudes and were willing to try something new so that the students would have a positive learning experience.

The Class. Eighteen third grade students participated in this project. Twelve of the students were male, and six were female. The students in this class read on grade-level with several reading above grade level. These students had not had prior experience creating projects or documents like the one required for this project. Over half of the students in the class reported that they had access to the Internet from their homes. The students seemed eager to embark on the project activities.

The Library Media Center (LMC)/Classroom. Main Street Science Magnet Academy (MSSMA) is a new school, less than five years old, with a teaching faculty who are known in the local area for their enthusiasm for teaching science to elementary students. It includes both neighborhood and a lottery population of students from around the city. Students come from a wide range of socioeconomic backgrounds. The LMC has had a full-time LMS for two years. In the LMC, students had access to eight networked computers with Internet access, reference materials, and trade books. Three networked computers were also available in the classroom.

Motivation to Collaborate

The LMC at Main Street Science Magnet Academy functions in a modified flex scheduled environment. While regularly scheduled library classes are conducted throughout the week, a significant portion of the time available is left unscheduled so that teachers and students can use the LMC on an as needed basis. This flexible schedule permitted the LMS and the teacher to work together to plan and implement a technology integrated research-based writing unit for third grade students.

The library media specialist (LMS) meets periodically with grade level teachers to discuss information literacy and technology integration. In a discussion with third grade teachers, the LMS learned that one of the teachers was interested in improving her writing instruction. The media specialist met with the teacher individually to discuss a possible collaboration opportunity that would integrate technology and report writing in an upcoming unit. After a thorough review of the state courses of study, the teacher and media specialist met again to select a particular unit for their collaboration. Weather preparedness was chosen because students had previous exposure to the topic and had met it with great enthusiasm.

The teacher reported that in the past, instruction and exploration of severe weather was based primarily on textbooks and video resources. For a final project, the students made individual posters that provided information about a particular type of severe weather. The media specialist suggested that for this project the students work in groups to examine a type of severe weather likely to occur in the area in which the students live. Thus, the research was made relevant to the students by focusing on weather types they had experienced in the past and were likely to experience again in the future.

Materials

The library media specialist developed several resources to aid the students in their research. First, a simple multimedia slideshow presented to the students at the onset of the unit outlined the

objectives and final outcomes for the students. The slideshow also served as an example of a multimedia presentation for students who had not been exposed to that medium. Also, students were given a note-taking guide to record answers to specific questions and a multimedia template (See figures 1 and 2) to structure the final presentation.

Figure 1. Note Taking Guide.

Name _____ Group _____

Note-Taking Guide

Description of Storm:

1. How did your storm get its name?
2. Where are you likely to see your storm?
3. What time of year does your storm happen the most?
4. How would you recognize your storm? (What does it look like)
5. How does your storm "act"?
6. Are there any "famous" occurrences of your storm type?**Preparing for the Storm:**

1. How would you know that your storm is coming?
2. What is the most important thing to do when you hear that your storm is coming?
3. What is the second most important thing to do?
4. What's the next most important thing to do?
5. What is one "interesting" thing that you should do before your storm strikes?

Aftermath of Storm (Damage:

1. What does the landscape usually look like after your storm?
2. What does the sky usually look like after your storm?
3. What might your street look like after your storm?
4. What changes or problems might your storm cause for the community helpers in your town?

Figure 2. Research Source Tracking Page.

Sources:

Title	Author	Publisher	City of Publication	Date

These guides, or scaffolds, were provided to students at the outset of the project to provide support for their learning activities. Scaffolds that are created prior to a need are described as "hard scaffolds" by Brush and Saye (2002). According to Brush and Saye, hard scaffolds are those that can be pre-determined to be needed, such as the note taking guides in the severe weather project. Whereas, soft scaffolding is the support that teachers provide on the fly in the form of questioning, modeling, or other forms of non-tangible assistance. Finally, the library media specialist developed a list of online resources in print and digital form.

Non-Technology Resources. The LMS provided the students with a variety of resources that they could use to complete their research activities. These included various trade books on weather, print encyclopedias (general and subject-specific), atlases, almanacs, and dictionaries. The LMS also created a note-taking guide and a bibliography of suggested print-based references. These resources were available to students throughout the unit activities, with no accessibility restrictions.

Technology Resources. The LMS also made nontraditional resources available to the students. Students could access the Internet and library catalog in an online format, electronic versions of encyclopedias, a web-based bibliography of project-related websites (webliography) as well as relevant videos and DVDs during their research activities for the project. The LMS also provided them with access to multimedia presentation software (Microsoft PowerPoint), a template that provided structure and development reminders to the students, and a scanner during their synthesis (Eisenberg & Berkowitz, 1988) activities. When the students' projects were completed, they had access to a projector and screen for their final delivery of their completed presentations.

Procedures

Planning. The "Preparing for Severe Weather and Natural Disasters" unit was conducted over the course of approximately five weeks (one or two scheduled LMC visits per week) during the spring of the school year. The LMS had an established routine with the teachers in her building of attending grade-level planning meetings on a regular basis. During the third grade planning meeting the teachers expressed the desire to have support during the writing instruction activities that were due to occur in the curriculum. The LMS offered to help with a lesson that would involve writing, and proceeded to conduct a preliminary exploration of potential topics that would fit into the third grade curriculum. During an individual planning meeting with the teacher, the topic of "Severe Weather" was chosen. "Severe Weather" is a topic that is required to be taught under the course of study and, further, one in which the teacher felt the students needed further instruction in order to meet the course of study objectives.

The LMS and the teacher discussed the contributions each would make to the unit. The classroom teacher was responsible for the writing portion of the unit, once the students had gathered the required information. The LMS was responsible for the technology integrated into the unit. The focus of the technology integration was an effort to make the various tools as "invisible" as possible to the students so that their attention could be fully focused on the content being learned, rather than on the technology.

Implementation. The LMS and teacher used the first day of the unit for introduction and discussion that provided the enabling context (Hannafin, Land, & Oliver, 1999) for the students. The 2004 Indian Ocean tsunami was still fresh in the minds of the students, and the LMS used this event to provide relevance to the unit. The LMS and students discussed several stories circulating in the news media about lives being saved due to the heroism of a few knowledgeable individuals. It was during this discussion that the LMS suggested to the students that they might also be able to save lives one day based on the material they learned in the severe weather preparedness unit. Once the introductory discussion was complete, the LMS and students

brainstormed for types of severe weather that frequently occur in their geographic area. While the teacher and the LMS had determined which weather events would be studied during the unit, became personally invested in the project through the guided brainstorming activity.

Following the introduction to the unit, the LMS spent one instructional day, during the regularly scheduled library time, introducing students to the note-taking guide the students would use to organize their work as well as appropriate reference resources available to them. The first group responsibility, the organizer, was assigned on this day. The other group responsibilities, peacemaker and resource checker were assigned later in the unit. The LMS trained the students in how to fulfill each of these roles on the first day of instruction by providing job descriptions for each role and allowing the students to assign role responsibilities to each other. In groups with more than three students, there were two resource checkers.

Most of the instructional activities took place over three days. The students worked in the library both during their regularly scheduled time and during additional time that was scheduled by the teacher and the LMS. Students worked as a large group and as small groups as the unit progressed. This group of third grade students did not have a strong background in note-taking for writing purposes. The LMS presented the activity to them as "organizing yourself" rather than "taking notes." This allowed the students to be less fearful of a skill that they saw as one exclusively conducted by the older students in the building. It also allowed them to take notes and organize their information in a more egalitarian manner. The students became more willing to delegate information-seeking skills to members of the group, rather than remain intent on completing the note taking guides in the order in which they were presented. This note-taking, however, was a skill that was a bit difficult for them to grasp at first. The teacher and LMS planned for the students to use two days to construct their presentations, but this schedule was altered as the unit progressed. Students ended up creating most of their presentations during nonscheduled instructional time during the day. The teacher and the LMS allowed one day to be used for proofreading and editing activities. Because, each individual group progressed at a slightly different rate throughout the unit, the LMS ended up assisting with proofing and editing throughout the latter half of the unit schedule. The students were scheduled to present their projects to the entire class during a regularly scheduled class day. However, due to unforeseen changes in the school schedule, the presentations were postponed until closer to the end of the school year.

Discussion

Library Media Specialist's View. Throughout this project, the LMS marveled at the students' enthusiasm and willingness to stay on task. The LMS found that students learned to use reference and trade materials without the need for isolated how-to lessons. Using the resources to help create a project provided an authentic use of those materials; resources were appropriately used as a means to an end and not vice versa. Also, incorporating technology and utilizing student-created project helped create an atmosphere for animated discussions of various aspects of weather and weather preparedness. Finally, the LMS described her feelings as she guided students through the proofreading and editing phase after the projects were completed as "conflicted." She found it difficult to balance the emotional needs of the students to reach closure on their projects, the editing needs for each presentation, and her own desire for the students to create products with as professional of an appearance as possible. The LMS plans to work closely with grade-level teachers in the future to find an appropriate balance between expediency of completion, high standards for the finished product, and grade-appropriate expectations.

The Teacher's View. After this experience, the teacher sees the benefits of collaboration. The teacher's self-confidence in her contribution to the project (Brown, 2004) increased as a result of the successful completion of the unit activities. She said, "I didn't think I could do it before, but

now I think I can." This willingness to collaborate even extends to activities that might occur with other teachers on the faculty. Not only did the teacher say that she'd be more likely to manage a multimedia project in the future, she also is interested in having projects of this sort be "continuing goals" in her classroom. She was intrigued by the self-contained project, but is interested in having ongoing group projects as well. When the rest of the third-grade teachers heard about the unit, they expressed their interest in collaborating with the LMS for research-based units as well. They were interested in restructuring library schedules to allow more time for flexible access and other collaborative units.

The teacher's reactions to the technology integration and collaboration were especially positive since this was an unfamiliar curricular area for her. She said that, this approach was an "excellent way to use cooperative learning. It really showed each student's strengths and weaknesses." Unfortunately, this teacher often wasn't able to see the students' interactions as they completed some of the research activities during the latter parts of the unit. She is interested in structuring future collaborative units so that this would be possible. The template that the students used to create their final projects was of particular interest to her as well. "The students could not have accomplished nearly as much as they did if the had had to design a presentation [from scratch]," she said. Her observation supports information found in the literature that discusses the benefits of collaboration. That is, that the LMS can contribute knowledge and skills in specialized areas such as information literacy instruction (Thomas, 2002) and research strategies and technology skills (Asper, 2002) to the project.

The Students' View. Overall, the students were intrigued during the introductory lesson when they heard about the two scenarios regarding knowledge of tsunami characteristics. But, while the students were generally enthusiastic about working on the project, they did need some guidance on using the note taking guide. The LMS speculated that they were not accustomed to having a document that could be completed in random order. Even as young as third grade, these students had become extremely accustomed to completing "worksheets" in order. The lack of a linear research requirement necessitated additional soft-scaffolding (Brush & Saye, 2002) in order to break down some anxiety associated with the process.

The biggest negative reaction from the students had relatively little impact on the research portion of the assignment. The students became impatient during the editing and proofreading phase of their work and seemed to lose interest. The scheduling of the unit close to the end of the school year may have exacerbated this reaction. Also, the LMS noted that there were times when her expectations regarding the quality of the student editing and proofreading may have been inappropriate for these third graders' developmental needs.

Lessons Learned. The students, the teacher, and the LMS all experienced the development of traditional library skills with minimal use of unidirectional, didactic, instructional methods. The students demonstrated they had become able to use encyclopedias, online databases, and other references sources without the obligatory (and many times dreaded) reference lesson. The students who participated in this project showed evidence of retaining information after their projects were completed. For instance, one student pointed out cloud formations consistent with thunderstorms to her classmates. "Look," she said, "those clouds are dark grey and low to the ground – we must be getting ready for a thunderstorm, just like we learned in our weather unit." Another student was able to describe the function of an atlas when he overheard a classmate ask the LMS, "What's an atlas, again?" He was able to say, "Remember, we used those before. They are books that have maps in them."

Because collaboration of this type was new for both LMS and teacher, there were often times that roles defined during the planning process were not clearly implemented. Brown (2004) discusses the importance of clearly defined roles to the success of collaborative efforts. By having clearly

defined roles, participants in a collaborative project can be confident that their expertise is being wisely utilized and that each member is contributing in an equitable manner.

Role definition was not limited to the teacher and LMS, however. Group roles for the students were essential to fostering a positive group dynamic. This was not part of the original unit plan but developed as needs arose. The LMS and the teacher recognized that in addition to the students learning about the characteristics of severe weather, the LMS and teacher would also need to teach students how to become more independent in their own learning activities (Bush, 2003) a target literacy skill in the Information Literacy Standards (AASL and AECT, 1998). By assigning roles to each of the members of the research groups, the LMS and teacher modeled the expectations that the students would be able to manage their own learning activities. Since the students fulfilled the requirements of these roles, the teacher and the LMS were then more available to assist them when difficulties arose during research and writing activities.

Modifications for the Future. The teacher and the LMS identified some common concerns about the unit implementation. Each commented that the unit took longer to complete than they had initially planned. Both were able to modify their schedules to allow students to finish but also felt that planning for the additional time required would make future unit implementation smoother. Future collaboration projects such as this are likely to include more time for students to work in classroom and less time spent on proofreading and editing.

Also, they both noted that the pace of individual groups varied widely. Accommodating the different paces of groups for future units is a planning priority for both professionals. In addition, the teacher and the LMS noticed difficulties relating to the procedures associated with citing sources. Students initially had a hard time understanding the rationale behind and process of citing references. To prepare students for this activity, the LMS plans to incorporate citation into her information literacy lessons during the following school year. In addition to making the purpose of certain research-related activities clearer to the students, the teacher and the LMS need to have more clearly defined roles for each other in future collaborative projects.

As this was the first collaboration experience for each of the adults involved, the teacher and LMS would often discuss roles *during* the project. While the classroom teacher stated willingness to do anything the LMS suggested during the collaborative meetings, both educators felt that their roles were too undefined at times. Future collaborative projects will see a more clearly defined job description at the onset for both the LMS and the teacher. This will prevent either participant from taking on too much or becoming to overextended as the students are engaged in these complex research activities.

Regarding role definition, Brown (2004) asserts, "Sometimes the [library media specialist] may need to recognize the importance of taking a subordinate role in the project" (p. 15). Modifying her role as the "editor" for this project was one of the first modifications the LMS suggested when reflecting on the project. Rather than having the teacher assume this role, however, the LMS suggested that students participating in future projects be taught to assume the role of editor/proofreader. In addition to supporting additional curriculum requirements concerning spelling, grammar, and writing skills, this role can also serve to help students learn to manage their own learning processes. The teacher and the LMS speculate that the students were resistant to assuming this role during the weather project due to a lack of understanding of the importance of it. Therefore, the teacher and LMS plan to present the rationale for this phase to students earlier in the process so that they take ownership of the production aspect of their project work.

Implications forPractice. The experience of this teacher and LMS presents several implications for K-12 educators. First, the adults and students who took part in the unit deemed it to be successful, in spite of certain aspects that need to be modified for the future. First-time success is

a powerful motivator that may permit subsequent attempts at tasks initially found to be difficult. Therefore, LMSs and teachers may want to consider embarking on collaborative project activities despite feelings of anxiety. School administrators also may want to consider the context of the library media program in relation to the organization of the entire school. Teachers and LMSs are more likely to collaborate in the implementation of projects such as the Severe Weather unit if the library schedule is flexibly scheduled. Flexible scheduling permits a variety of activities to take place that can positively impact student achievement (Lance, 2002).

Students can benefit from participating in projects that arise from collaboration between a teacher and library media specialist. Typically, classroom teachers interact with a group of students for a single academic year. Most library media specialists, however, interact with students across several academic years. The LMS is in a unique position to observe student development over time. This longitudinal interaction with students permits the LMS to contribute information about student needs, learning styles, personalities, and past academic experiences (Tschamler, 2002) to the collaborative effort.

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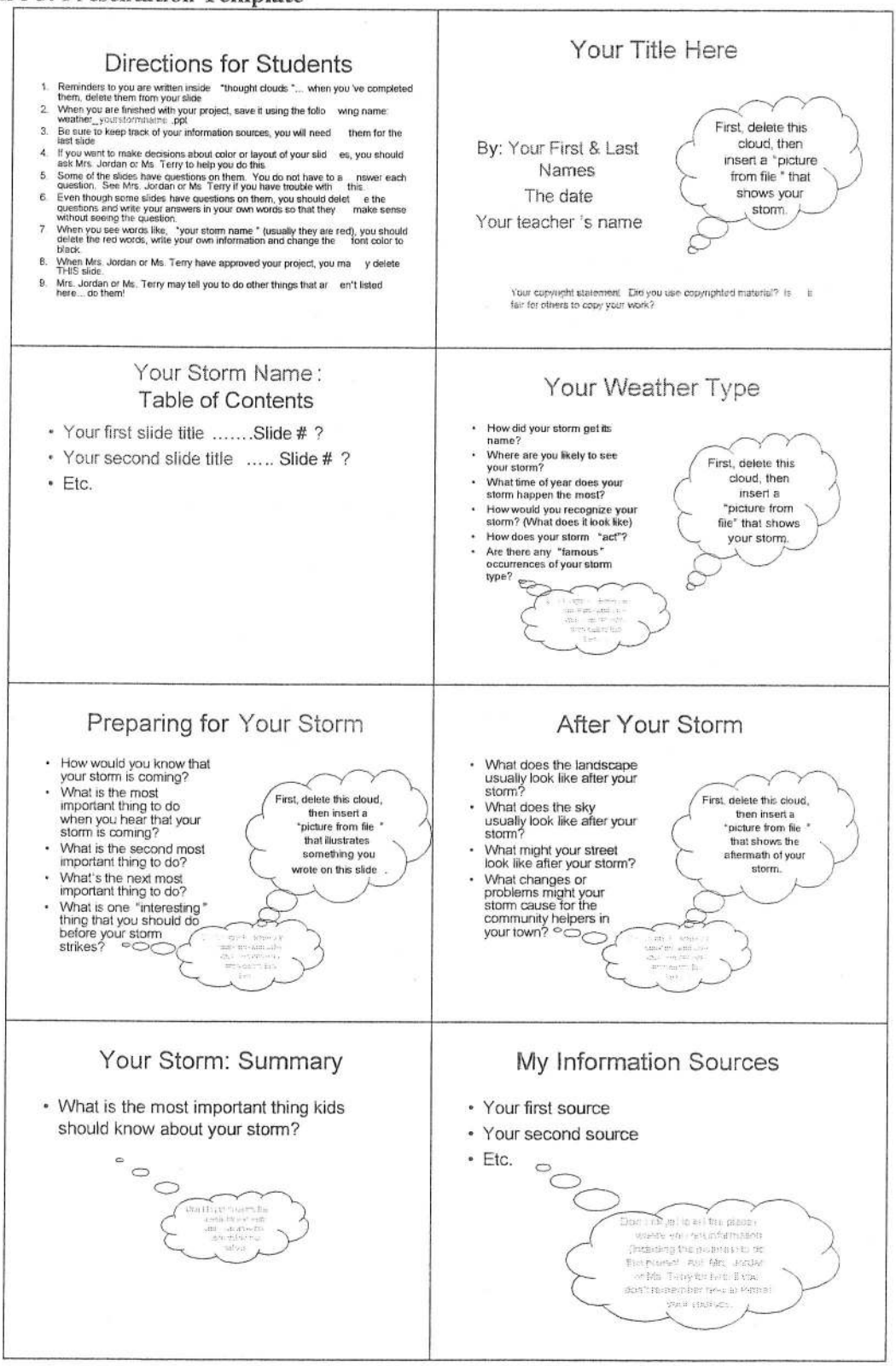
Figure 3. Presentation Template



Assessing and Understanding in the School Library Program

Doug Achterman
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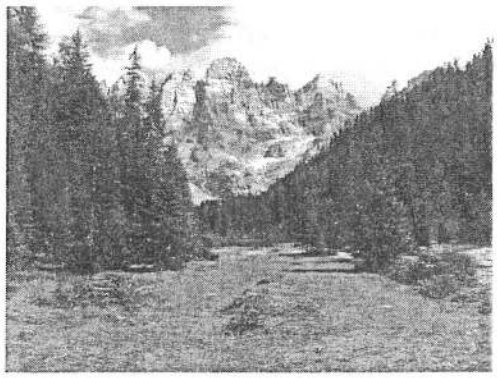


Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Assessing and Understanding in the School Library Program

Like effective classroom teachers, library media specialists make hundreds of on-the-spot assessments daily, adjusting instruction, modifying behaviors, increasing or decreasing interventions as needed. These anecdotal assessments inform our overall impressions of how both we and our students are doing. But such measures can be misleading.

A constant source of frustration for me—and for most library media specialists-- is that many students choose such poor sources of information for their research. I watched this daily for some years and addressed it in my library program in three key ways:

- I created a digital library collection of high quality resources, including online databases and selected Internet sites that students could access at school or at home 24/7.
- I collaborated with classroom teachers, enlisting their assistance and support to teach information literacy skills as an integrated part of their curriculum. When possible, I got teachers to add information literacy skills to their assignment rubrics.
- I worked with students individually and in groups to steer them toward high quality sources.

While online database usage grew steadily, and while increasing numbers of teachers required students to complete website evaluation forms for web sources, every day I watched students come to the library, type in simple search terms, access the first page from the results list, and either copy the text or print without any regard to the quality of the source. In spite of my best efforts, I was fairly convinced I was losing the information battle. Almost against my instincts, I decided to conduct a study on the searching habits of our students to find out for sure. I felt I needed to pinpoint specific behaviors I could target in my work with both students and teachers. I figured the bad news might actually help me do my job better.

Conversations with Dan Fuller, adjunct professor in the San Jose State University School of Library and Information Science program, gave me some confidence to proceed. Dr. Fuller visited my school library a few times and we exchanged several e-mails in devising a survey tool that we thought might yield fruitful results. The survey questions mainly dealt with what search tools students used, why they used them, how often they switched search tools, how they evaluated information, and why they chose the sources they chose (see Appendix A). Dr. Fuller also introduced me to SurveyMonkey.com, one of several online survey tools that allow the user to collect and analyze data electronically.

At the end of a class's visit to the library for research-related activities, I asked students to spend five minutes completing the online survey, which was linked to the library's homepage. Classes were asked to participate as they came into the library; the first five included English 11 (juniors), French 3 (mixed grades, mainly juniors and seniors), Biology (sophomores), Modern American Literature (juniors and seniors) and Genetics (juniors and seniors). After students in these five classes completed the survey, I began looking at the results. SurveyMonkey enables users to download data in a variety of formats, including relational databases and spreadsheets. This allows data to be sorted easily through a variety of lenses. I opened a file in Excel and prepared to confirm my worst fears. I began juxtaposing columns of information looking for patterns, and it wasn't long before I discovered some important connections.

Of the 127 students who completed the survey, just under 45 percent said that search engines such as Google, Yahoo!, and Ask Jeeves were the search tools they found most useful for their assignment. Nearly 48 percent said the most useful search tools were links off the library web page, the library catalog, or online databases. The leading choice among search tools students used first was links off the library web page, with 27.7 percent, followed closely by Google with 24.6 percent. This data suggested to me that the presence of the library program was making some difference in the kind and quality of sources students were viewing.

But it was viewing the results through the lens of collaboration that made me begin to understand the nature of my job in a different way. As it turned out, two of the teachers whose students took the survey had collaborated with me on their units from start to finish, including activities both inside and outside the library. One teacher squeezed on to the library schedule at the last minute but still managed to spend a few minutes on the phone with me, during which we decided to show students a few searching strategies before they began their work. The other two teachers, in spite of verbal promises to the contrary, communicated only the broad content of their lessons to me. Essentially, no collaboration took place.

Among those students whose teachers did not collaborate with me, when asked how they decided if the information they used was reliable, 30 percent answered, "I used whatever looked good to me" (fig. 1). Among students whose teachers did collaborate, that number shrank to 10 percent (fit. 2).

Figure 1

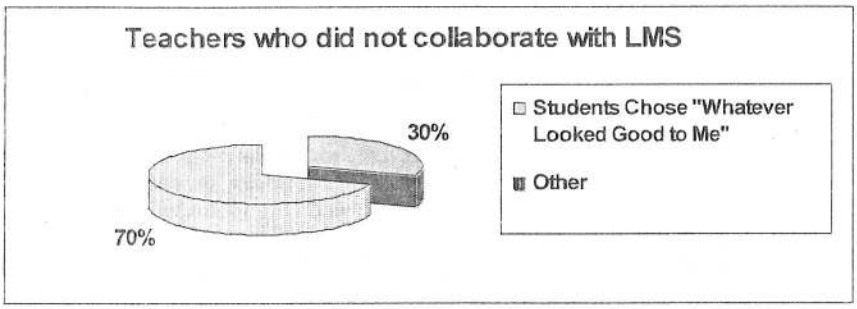
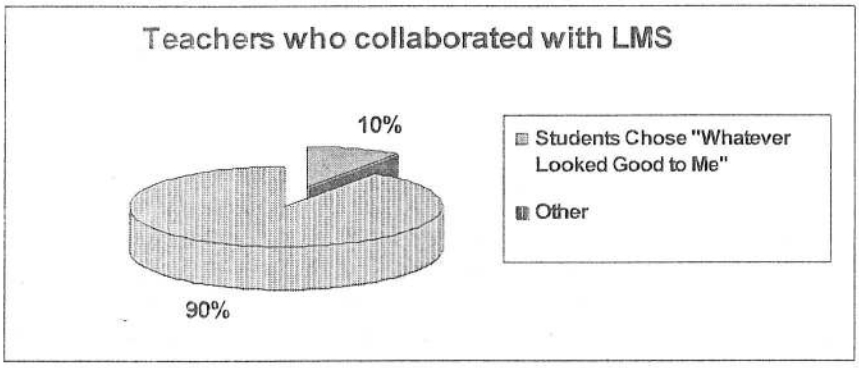


Figure 2



The effect of collaboration is even more pronounced in relation to what sources students found most useful. Among students whose teachers did not collaborate, 38 percent said they found the links off the library page, the library catalog, online databases, or the library media specialist's recommendations most useful (fig. 3). Among those students whose teacher did collaborate, the number rose to 73 percent (fig. 4).

Figure 3

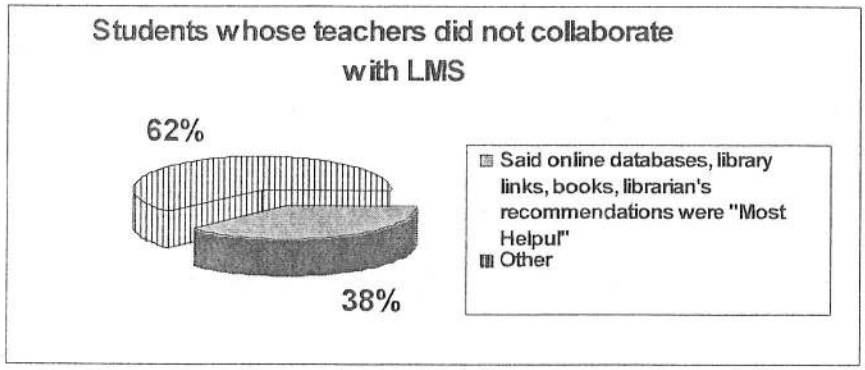
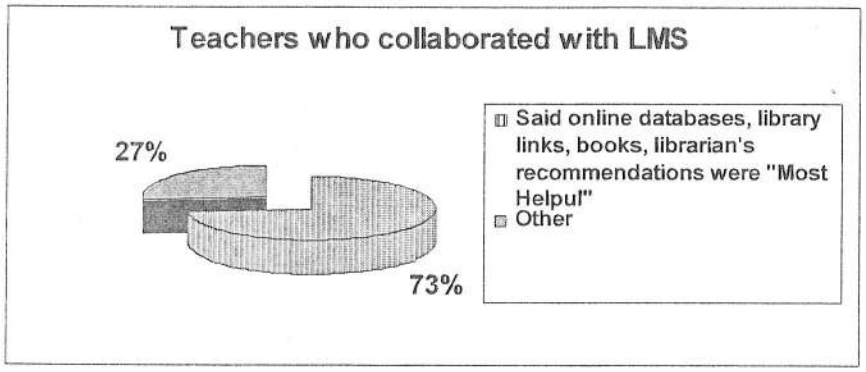


Figure 4



Looking at the data this way led me to an unmistakable conclusion: my collaborations with teachers have a greater impact on what students do than my direct interactions with students. A 2004 study by Williams, Grimble and Irwin supports this contention. Teachers surveyed at Carmel High School in Indiana always rated the reliability of the school's online databases higher than that of the Internet, but "while 78 percent of the faculty 'sometimes' or 'often' refer their students to the Internet, 30 percent or more 'never' refer students to specific print reference materials, multimedia resources, and electronic databases." The English department did a significantly better job of advising students to consult online databases before the Internet and to use print resources before electronic resources. The authors suggested that this might have been "due to the strong collaboration of the (library media specialists) with the faculty of that department."

As a classroom teacher, I often viewed the impact of particular teaching strategies as direct and transparent. As a library media specialist, my instructional goals must be integrated into the classroom teacher's and supported and extended by those teachers when they are away from the library in their own classrooms. A terrific library lesson means nothing if it remains just a library lesson. My collaborations with classroom teachers in part help those teachers understand the importance of information literacy in the context of their own subject matter and help them build that same understanding in their students.

While this was a preliminary study, the data confirmed that my three strategies for addressing students' selection and evaluation of sources are on target. Nevertheless, the time and effort spent gathering survey data about my students' search behaviors led to a new and deeper understanding of my role as a library media specialist. In my harried schedule, I used to squeeze in collaboration with teachers between all my other responsibilities. Now, I frame my day a bit differently, squeezing in all my other responsibilities between my collaborations with teachers. Nothing I do has a greater impact on students.

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Appendix A

San Benito High School Library Search Survey

Please complete this survey as honestly and accurately as you can. The information you provide helps us better meet your needs.

Date:
Period:
Teacher:

1. Did you come to the library as part of a class, for an independent assignment, or for non-school related research?

a) as part of a class
b) for an independent assignment
c) for non-school related research

2. Which search tool did you use first?
a) library catalog b) links off the library web page c) links off my teacher's web page d) Online databases such as Infotrac, SIRS, Discovering Collection, etc.)
e) Google f) Yahoo g) AskJeeves h) pressed "Search" on Internet Explorer i) other

3. Which search tool was most useful? a) library catalog b) Online databases such as Infotrac, SIRS, Discovering Collection, etc.)
c) Google d) Yahoo e) AskJeeves f) pressed "Search" on Internet Explorer g) other

4. What were your reasons for choosing this search tool?
a) my teacher told me to use it b) I found this tool useful on a previous assignment c) another student told me to use it d) the librarian suggested I use it e) it's the tool I almost always use f) I'm not sure why I chose it

5. How many different sources did you look at for answers to your question(s)?
a) 1 b) 2 c) 3 d) 4 e) 5 or more

6. Did you find the information you were looking for?
a) not at all
b) found only a little of what I was looking for
c) found some of what I was looking for
d) found most or all of what I was looking for

7. How many screens or pages did you look at?

a) 1-2 b)3-4 c) 5-6 d) 7-8 e) more than 8

8. How much time did you spend searching?

a) less than 5 minutes
b) 5-10 minutes
c) 10-15 minutes
d) 15-20 minutes
e) more than 20 minutes

9. How many pages did you print?
a) 1-2 b) 3-4 c) 5-6 d) more than 6 e) did not print

10. How many pages did you e-mail to yourself or save to a disk?
a) 1-2 b) 3-4 c) 5-6 d) more than 6 e) did not e-mail or save to a disk

11. How many of these pages (from questions 9 and 10) do you think you'll actually use for your assignment?
a) 1-2 b) 3-4 c) 5-6 d) more than 6
e) did not find information that I will use

12. What is your favorite search tool?
a) AskJeeves b) Google c) Ask Jeeves d) library and teacher web pages e) library catalog

13. How did you decide whether the information you found was reliable?
a) I completed a website evaluation form
b) I used an online database like Infotrac, SIRS, Discovering Collection, etc.
c) I used whatever looked good to me
d) I used the sources the teacher told me to use
e) I used the sources the librarian suggested

14. How did you take notes for this research?
a) printed whatever looked useful
b) wrote notes on paper
c) cut and pasted into my own file
d) e-mailed pages, links or files to my house

15. Which best describes your reason for doing this research in the school library?
a) access to computers and a fast Internet connection
b) can get help from the librarian
c) can visit with my friends while I work
d) it's due today and I have to get it done
e) other

16. Have you looked at any print materials (books, magazines, newspapers, etc.) for this search?
a) yes b) no

Appendix B

San Benito High School, Fall 2004
Student Search Survey Summary Highlights

Number of Students Responding:	**127**
% with Internet access at home:	**82**
Search tool used first: % who said links off library page:	**27.7**
Search tool used first: % who said Google:	**24.6**
Search tool most useful for this assignment: % who said links off library page, library catalog, online databases:	**47.7**
Search tool most useful for this assignment: % who said Google:	**26.2**
Search tool most useful for this assignment: % who said Google, Yahoo, AskJeeves, "Search" on Internet Explorer	**44.6**
% of students who did NOT print:	**81.5**
% students who e-mailed or saved to disk:	**26.1**
% who took notes on paper:	**61.5**
% who cut and pasted into a word processing file:	**20**
% who looked at print materials for this research:	**54.6**
% who chose "whatever looked good to me" if their teacher did NOT collaborate with LMT	**30**
% who chose "whatever looked good to me" if their teacher DID collaborate with LMT	**10**
Among students whose teacher did NOT collaborate with LMT, % who said online databases, library links, books, and LMT's recommendations were "most useful"	**38**
Among students whose teacher DID collaborate with LMT, % who said online databases, library links, books, and LMT's recommendations were "most useful"	**73**

Analyzing News Coverage

An Antidote to the Bird Unit

Frances Jacobson Harris
Suzanne Linder

Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Analyzing News Coverage: An Antidote to the Bird Unit

David Loertscher has coined the term "bird units" to describe low level learning experiences in the library media center in which students learn to transpose facts from one medium to another (Loertscher 2003, 42). Such worksheet-style exercises have long been a mainstay of what many educators consider library research. "Fat bird units" improve upon their skinny cousins because students are allowed to synthesize their facts into a report or research paper on a topic of their own choosing. Aside from the superficial learning that typically occurs with bird units of either type, they are generally unsatisfying experiences for both teachers and students. Student products are boring to produce and stiflingly predictable to grade. Clearly, both sides would benefit from an antidote.

As our school's senior English teacher and library media specialist, we created an antidote to bird units with an activity in which high school seniors conduct a comparative analysis of online news stories. Students immerse themselves in the details of a current event by exploring a variety of news sources which they then analyze for bias and differences in presentation. The project is intrinsically interesting for students, who enjoy the hunt for sources and appreciate the detective work involved in investigating those sources. This focus on media also allows the two of us to examine the connections between information literacy and media literacy, which are hardly distinct skills for students of this generation.

If we were to construct this project in the "fat bird unit" mold, students would be asked to simply write a report on a current event. They would search reputable online information sources and summarize their findings into a cohesive whole. In the process, they would learn about a variety of news sources and various strategies for searching them. They would learn differences between the free web and proprietary information databases, and when to use each. They would learn to identify the important facts of the event, and perhaps capture the controversies and the sides taken. But there are number of important lessons they would *not* learn. They would not learn that public perception of an event may be influenced by the way it is reported. They would not learn that the visual information that surrounds a story may affect its meaning. They would not learn how to spot the use of language that insinuates perspective or bias into a story that purports to be objective.

In our antidote version of this assignment, students learn all these things and, we hope, much more. Rather than merely writing a narrative report about the event, students are asked to analyze the event through the lens of how it is reported by different media sources. This type of exercise gives them a much more nuanced view of the event and goes far beyond reporting the "facts" of the story. Students learn to look for the cues, both written and visual, that color the story's meaning. They learn to distinguish between editorial content and news content and how to detect editorial "creep," or bias in news reporting. Finally, they learn to come to their own conclusions about the story and about the sources that report it.

The basic assignment goes like this:

> Choose a news event, occurring in the last ten years, and compare presentation of the event in three sources. One of the sources must be a "newspaper of record" (*New York Times*, *Wall Street Journal*, *Washington Post*, *Los Angeles Times*), one of those sources may be a newswire source (AP, Reuters, etc.), but the other source must be written by a unique agency (an individual or collective agency). Make sure that the newspaper of record story is not drawn from a newswire and vice versa.
>
> You may wish to look at the coverage of something that has already occurred, in which case *Lexis-Nexis* (a retrospective news database) will be your best reference source. If you choose to compare coverage of an event that is in the news right now, *Google News* will be a useful reference source. Both of these sources will be introduced in class.

You may not use coverage that is explicitly editorial (from the editorial page or a column where the writer is expressing his or her opinion on the topic). However, you may use coverage that purports to be "unbiased," despite the inclusion of what may look like editorial content to you.

Once you have chosen your event, and your three sources, write a two-three page, double-spaced, paper that discusses how the information is presented in the various sources. Keep the following questions in mind as you write (you will be expected to answer all the questions in the paper but do so in essay format, you should not include the questions or use bullet points, etc.):

- What differences do you see in the way the story is presented in your sources? What content is included or excluded in which publication?
- What is the tone and style of the story presentation in the various sources?
- What additional information (images, advertisements) appear around the story (may not be relevant for all sources)? What influence does this additional information have on your interpretation of the information provided by the source?
- Who is presenting the information? What clues inform you about the perspective of the author or publisher?
- When would you see using these news sources? For what purposes? (the answer may not be the same for all three sources).
- How does presentation of the story in the newspaper of record compare to coverage in the other two sources?
- What reasons can you come up with for the differences in coverage? Keep in mind what you know (or can discern) about the values of the news source.

Notes to keep in mind when selecting your event and coverage:

- You may need to examine more than one event, or more than three sources before you find the treatments you want to analyze. You need for there to be variation in your sources in order to have something to write about in your paper. Some events will lend themselves to more varied coverage than others.
- You will need to include the citation for your sources in a works cited page. Please use MLA format and make sure you keep track of where you find sources.

In the lesson that precedes the assignment, we model the search process and methods used to deconstruct a news source. For example, we look at how the impact of a story might differ when viewed on its source's website as opposed to when it is viewed on a news aggregator like *Lexis-Nexis*, where all formatting and other visual elements (including those surrounding the story) are stripped away. We display the results of a search on *Google News*, where the *Los Angeles Times*, the *International Herald Review*, "The Brad Blog," and uruknet.info ("information from occupied Iraq") all get equal billing. We look at hidden bias in the language that is used in reporting – such as the now-infamous captions that accompanied pictures of refugees in New Orleans, in which a black refugee toting a heavy load through deep water was described as "looting" and two white refugees doing the same were described as having "found" bread and soda.

Now in our second year of teaching this unit, we have found that the key to its success lies in the bulleted guiding questions. These questions force students to examine news sources at a deeper level than they otherwise might, and perhaps prompt them to form new habits in all their news reading. After assessing the students' work, we will revise the assignment once more for next year's cycle. On a more global level, further research is needed to understand the learning that occurs as a result of this type of high-level comparative analysis. What skills do learners need before they can make such distinctions among various news sources? When these skills are applied in a single situation such as this one, can students generalize their knowledge to other contexts? What happens if other broadcast media –radio, television, podcasts – are added to the mix? In those cases, what additional questions does the intelligent media consumer need

to ask? One thing is certain. If we ask students to merely report on what they read, we are back to the boredom and frustration of the bird units. And there is so much more for all of us to learn.

Further information about this project can be found at
http://www.uni.uiuc.edu/library/classprojects/linder/newspapers.htm.

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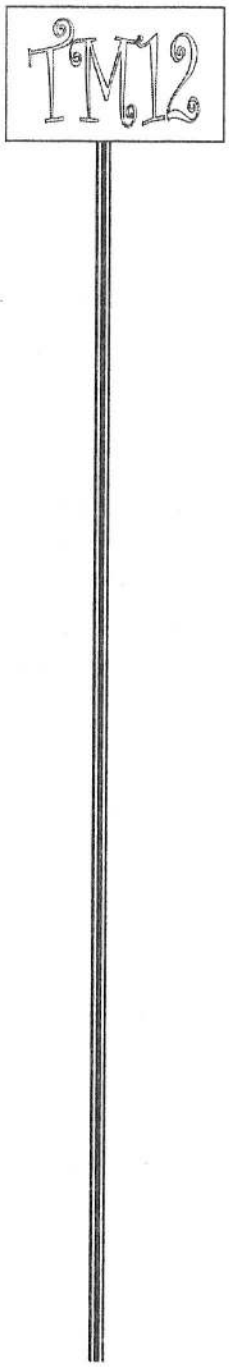

'Library' for Special Needs Kids

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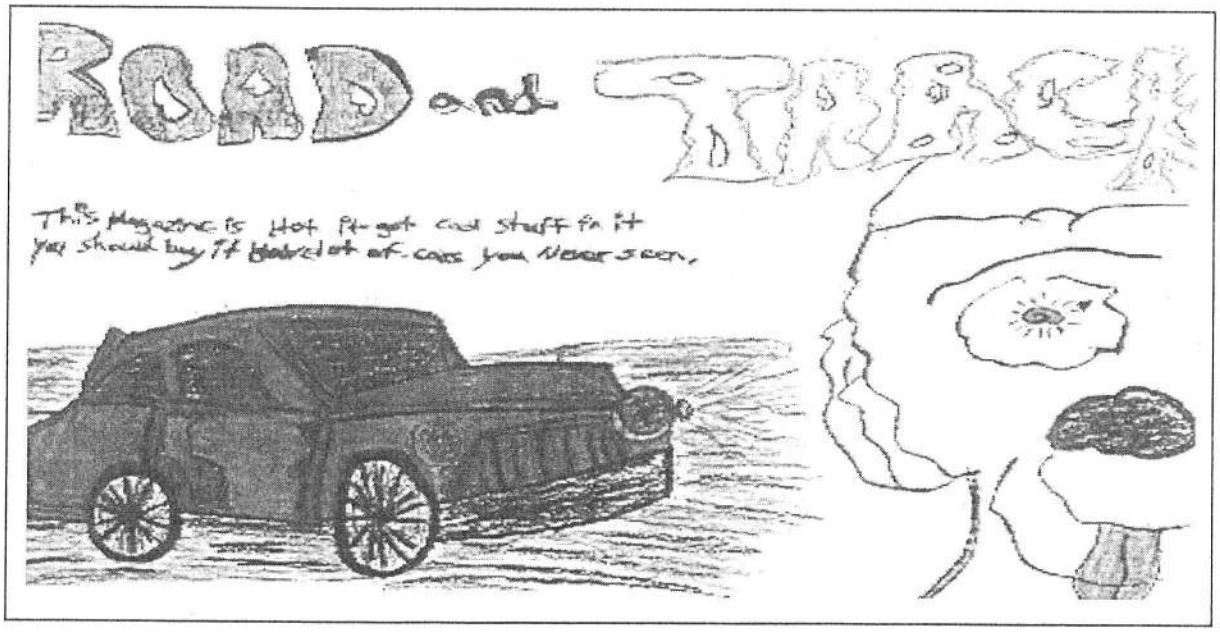
Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Introduction

The culminating activity in the "Magazine Matrix" unit that I taught with a classroom teacher at Vaughn Occupational High School, in May 2005, resulted in some amazing graphics (see the example below). These graphics (others are shown at the end of this paper) reflect the extent to which students grasped the concepts we had been trying to teach. The Magazine Matrix unit involved the use of progressively more complex matrices to help students organize information and evaluate a set of magazines for possible subscription renewal. Not only was the use of a matrix a new activity for these students—all of whom are cognitively disabled, with IQ's between 50 and 70—but coming to the library on a regular basis and actually having dozens of magazines in hand to look through and evaluate, were also new experiences for the majority of these kids.

This unit touched on each of the following tasks that used the 25+ magazines our library subscribes to: (1) browsing/reading for fun; (2) using a Table of Contents; (3) deciphering ads versus articles; (4) tallying; (5) finding an average; (6) comparing subscription prices to cover prices; (7) navigating to and around a website; (8) determining the "audience" and readability of particular magazines; (9) determining preferences; (10) entering and organizing 'data' in a matrix; (11) working with a partner; and (12) creating an ad that would "sell" a magazine or a product in a magazine. Students came to the library for five of the seven class periods during which the unit was taught, and they worked in their classroom on the other two days. The students who did not graduate at the tail-end of this unit came back to the library for another two days to start learning how to make a matrix using Microsoft Excel.



This "ad" for *Road and Track* magazine was created by a Vaughn High School student as the culminating activity in the Magazine Matrix unit. The text reads, verbatim: "ROAD and TRACK. This Magazine is Hot it got cool stuff in it you should buy it Have lot of cars you Never seen. "

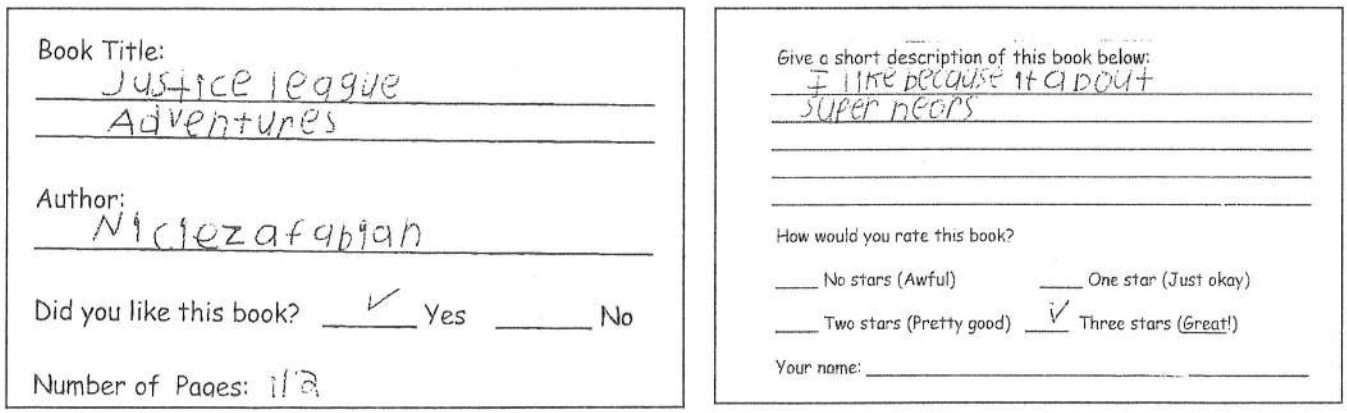
This paper discusses the two models that were combined to create this unit, and the applicability of them—actually, the *necessity of using* them—for this particular student population. The Magazine Matrix unit is described, and examples of the matrices from the various daily lessons are shown. The degree to which these matrices can be used to measure the level of understanding gained by Vaughn's students is discussed. And finally, questions about the most appropriate ways to assess gains in library skills made by students—with and without special needs—are posed for consideration by all who share an interest in ensuring we can track the effectiveness of our teaching.

Jacqueline Vaughn Occupational High School

Jacqueline Vaughn Occupational High School serves students with mild to moderate cognitive disabilities[1], who range in age from 14 to 21 years old. The facility is a former AT&T office building, located on the northwest side of Chicago. Enrollment hovers between 200 and 220 students, and the typical student stays at Vaughn for five or six years—or until age 21, whichever comes first. The majority of Vaughn students are multiply involved, including having visual, hearing, and/or speech impairments, or having physical handicaps that range from moderate to severe. Many of the students also have "organizational deficits"[2] and have difficulties remembering and staying on task without intervention. Other students lack self-control and the coping mechanisms that help form emotional stability.

Students function academically at or below the 4th grade level—measured in terms of reading comprehension. Variability in academic skills in notable however: within a single classroom, some students can perform effectively at a 4th (or even 5th) grade level, while others have no discernable reading ability at all.[3] Writing function is also highly variable, not only because many students lack the fine motor skills needed for proper penmanship, but also because students cannot easily relay their thoughts as written words. Students may thus be better able to *talk* about something than to write about it. Below and following are examples of "book review" cards that illustrate the varying abilities of Vaughn students. Students have the option of turning in one of these evaluations when they have read a library book. (When they have read, reviewed, and returned three books, they are entitled to take a free book from the stash of donated books that cannot be used in the library.)

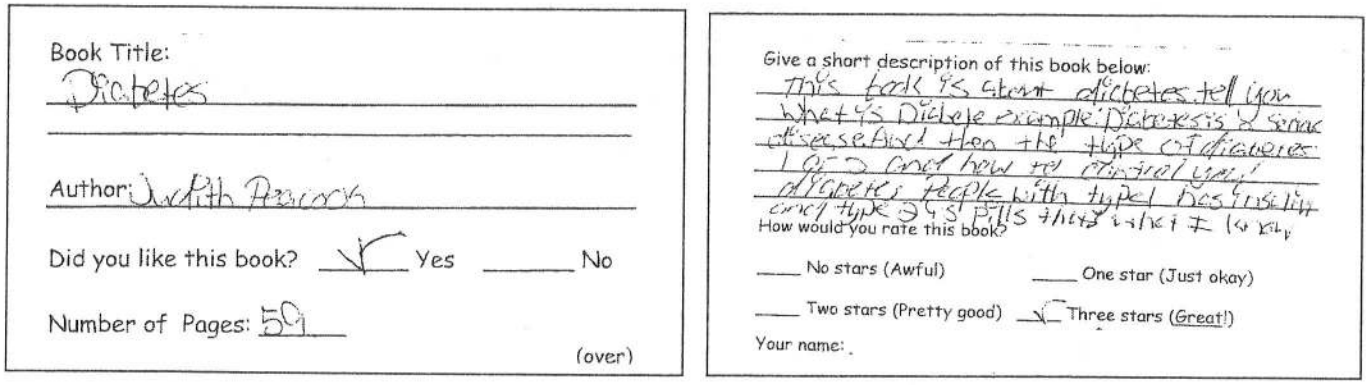
(Side 1) **(Side 2)**



Book Review card for *Justice League Adventures*. The description reads, verbatim: "I like because it about super heors."

(Side 1) **(Side 2)**

[1] "Cognitive disabilities" is the current euphemism for terms such as "EMH" (educable mentally handicapped) and "mentally retarded."
[2] Personal communication, Nancy Mayer, Vaughn Principal, in staff discussion, September 2005.
[3] Dr. Alice Giacobbe, Northeastern Illinois University, at Vaughn staff In-service presentation entitled, "Differentiation Instruction," September 2005.



Book Title: Diabetes

Author: Judith Pearce

Did you like this book? ✓ Yes ____ No

Number of Pages: 59

(over)

Give a short description of this book below:
this book is about diabetes tell you what is Diabete example: Diabetes is a serias desease And then the type of diabetes 1 or 2 and how to control your diabetes People with type 1 has insalin and type 2 us Pills thats what I know

How would you rate this book?

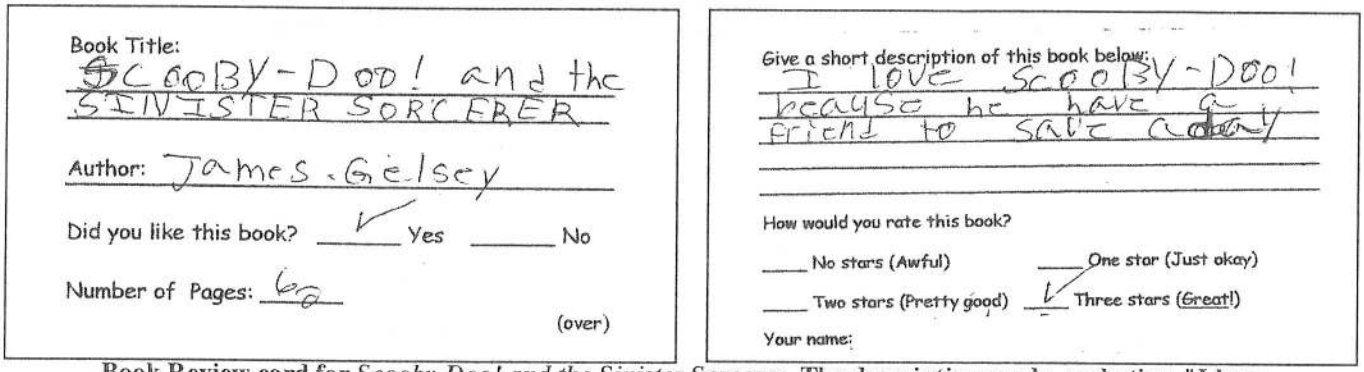
____ No stars (Awful) ____ One star (Just okay)

____ Two stars (Pretty good) ✓ Three stars (Great!)

Your name:

Book Review card for *Diabetes*. The description reads, verbatim: "This book is about diabetes. tell you what is Diabete example: Diabetes is a serias desease. And then the type of diabetes 1 or 2 and how to control your diabetes People with type 1 has insalin and type 2 us Pills thats what I know" This review was written by a student who herself has diabetes.

(Side 1) **(Side 2)**



Book Title: SCOOBY-DOO! and the SINISTER SORCERER

Author: James Gelsey

Did you like this book? ✓ Yes ____ No

Number of Pages: 60

(over)

Give a short description of this book below:
I love Scooby-Doo! beause he have a friend to save a day

How would you rate this book?

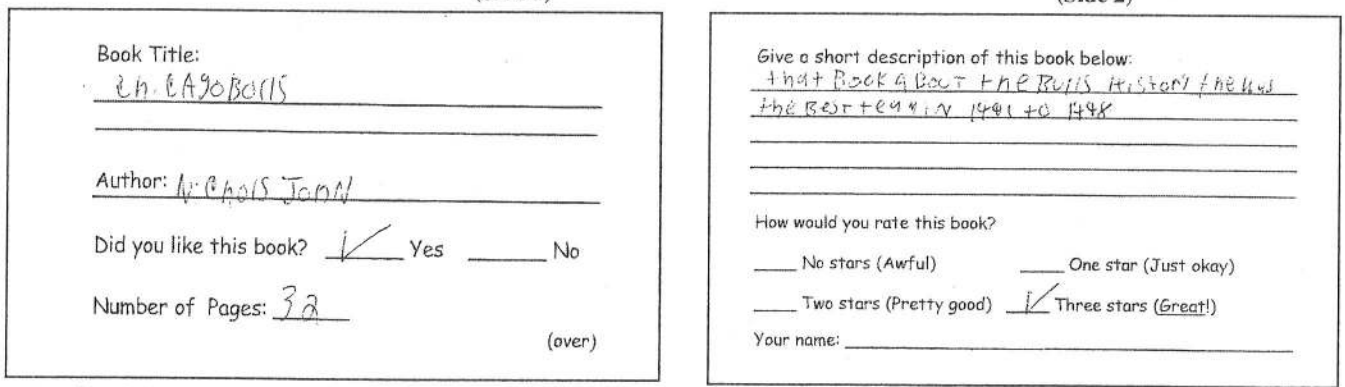
____ No stars (Awful) ____ One star (Just okay)

____ Two stars (Pretty good) ✓ Three stars (Great!)

Your name:

Book Review card for *Scooby-Doo! and the Sinister Sorcerer*. The description reads, verbatim: "I love Scooby-Doo! beause he have a friend to save a day.

(Side 1) **(Side 2)**



Book Title: th CAgo Bulls

Author: Michals John

Did you like this book? ✓ Yes ____ No

Number of Pages: 32

(over)

Give a short description of this book below:
that Book aBout the Bulls History the was the Best team iN 1991 to 1998

How would you rate this book?

____ No stars (Awful) ____ One star (Just okay)

____ Two stars (Pretty good) ✓ Three stars (Great!)

Your name: ____

Book Review card for *The History of the Chicago Bulls*. The description reads, verbatim: "that Book aBout the Bulls History the was the Best team iN 1991 to 1998"

Although teachers and parents may see growth in reading ability during the span of years a student attends Vaughn, there is very little *reportable* progress. The Stanford Test is the currently mandated testing instrument, but this type of test does not accurately reflect what the students know or can do. Special accommodations cannot be made for all of the students taking this test, yet the test is clearly

not geared for special needs students who have difficulty with sustained reading; difficulty determining which bubble to fill in for which response; and difficulty retaining the pertinent information they may have gleaned in the long reading passages. Standardized test scores from year to year at Vaughn show frustratingly little change. Academic growth at Vaughn is therefore measured in baby steps: a one-month gain over a year's time is considered a reasonable outcome. Internally, teachers and parents recognize that these tests are not the truest measure of student understanding or learning.

The school's curriculum focuses on teaching functional academics beyond the core and minor subject areas, with an emphasis on occupational development in the areas of business, hospitality, and service. This translates into helping students develop the occupational and life skills needed to work effectively in an office or retail setting, or in the hotel, restaurant, cleaning, and landscaping industries. Each month, emphasis is placed on both a character trait and a social skill in order to enhance the social and emotional growth of the students. The atmosphere at Vaughn is nurturing—but oriented towards helping the students become as independent as possible. It is in this setting that Vaughn's library was first opened to students in October 2004. I was hired that September as the first librarian they ever had.

Vaughn's School Library

The 2004–2005 school year was the first year during which Vaughn High School had a functioning library. The facility was the result of a Service Learning project initiated by several students from Northside College Preparatory High School in Chicago. These students and their staff sponsors worked together with Vaughn students and staff for more than a year to garner donations of time, funds, furniture, books, as well as several grant awards, that were then used to create the library. The half-time librarian position was put into the school's budget when the library was officially dedicated in December 2003, although it wasn't staffed until I came in September for the 2004–2005 school year. No clerical help is available in the library.

The current collection of about 3200 books (with about 500 of those still to be processed) is eclectic—a result both of the types of books that were donated and of the specialized curriculum and reading needs of the students. About half of the books were donated or acquired new before I came on as the librarian; another 25% of the books are used (including most of the paperbacks). And I have acquired the remaining 25% of the books since starting work at Vaughn. The majority of the holdings range from the 1st to 7th grade reading-level, although the top of this range is too difficult for Vaughn students. My acquisitions have focused on high interest/very low reading-level resources, as well as on supporting the school's specialized curricular areas and on the types of books that the students themselves have requested.

Physically, the library can comfortably accommodate a total of about 25 people. Class sizes at Vaughn average about 15, but can be as high as 22 students—usually with one or more individuals requiring a full-time aide and one or more using either a walker or a wheelchair. There are five Internet-connected computers in the library, but there is currently no automation. Students here really require hands-on assistance when they seek resources in the library[4].
Because the 2004/2005 school year was the first year during which Vaughn had a library—and it was my first year as a librarian—the faculty, students, and I all needed time to figure out what our working together could accomplish. Although I am certified as a K-12 librarian and to teach English

[4] I have revisited the idea of automation several times during the last year. Vendors have indicated that the technology does not yet exist to customize automation in order to highlight book titles so that finding a book is easier for those patrons who have visual, learning, and cognitive disabilities. While I continue to pursue the acquisition of a customized system—perhaps with audio *and* visual helps—our students will practice using an OPAC via Internet links to the Chicago Public Library's website.

and earth science at the high school level, I am *not* a special education teacher. I absolutely had to rely on the teaching staff to help me understand what it was like to work with these special needs kids. On the other hand, the teachers and students at Vaughn had never had a library before, and they were not fully aware of the types of learning we could do or the resources that were available to them. Whenever a teacher made a request to bring a class to the library, we first talked about the number of students who would be coming; the academic and physical abilities of the students as well as the number of aides and students in wheelchairs; the unit or topic currently being studied; the type of lesson or resources the teacher would like; and the number of library class periods he/she felt would be needed. This type of discussion—except perhaps for the part about aides and wheelchairs—is what librarians in any type of school would likely have with their classroom teachers.

By the end of the school year, I had collaborated on lessons or units with 14 of the 19 staff members. These collaborations ranged from single-period class sessions, to a unit on the novel *Because of Winn-Dixie* during which the students came to the library every day that I was present for more than a month and a half. Again, collaboration on various levels was absolutely key to whatever "successes" we had in the library. But for the units that I, my co-teachers, and the students found the most interesting and rewarding, I used a hybrid combination of the APACA collaboration model that I had previously developed, and the Matrix Model described by David Loertscher et al under their "Ban those Bird Units!" banner (Loertscher et al, 2005). The two separate models are summarized in the following section.

During April, May, and June of 2005, three hybrid units were taught. For the Jack-and-the-Beanstalk unit, students compared the features of various versions of this fairy tale and summarized their findings in a matrix. The Design-a-Dog unit was a spin-off from our reading of *Because of Winn-Dixie*. For this unit, student teams did research on three different breeds of dogs and stored their findings in a matrix chart. They then took the 'best' features of each breed and came up with a "composite" dog that they thought would be a reasonable mixture. This unit involved book and web research, and the students had to create a picture of their new dog breed. They gave a brief oral report to the class on what they came up with. For the Magazine Matrix unit, which is detailed in this paper, students helped me evaluate the various magazines that we subscribed to so that I could make better decisions about which subscriptions to renew. This unit is detailed in the last part of this paper.

The Models: APACA + Matrix

APACA

In 2004 when I was still a student at Dominican University, I received a grant to complete the research project entitled, "Ask•Plan•Acquire• Co-teach•Assess (APACA): A Simple, Low-Cost Model of Classroom Teacher/Librarian Collaboration." The funding, channeled from the Institute of Museum and Library Services through Kent State University's Institute for Library & Information Literacy Education (ILILE), was to test the application of the APACA model in nine libraries from the Chicago Public School (CPS) system. In May of 2005, funding was again received to test the model in an additional 15 CPS school libraries. The second grant, called "TLC: Teacher and Librarians in Collaboration," is being administered by Gail Bush, Director of the School Library Media Program at Dominican, with funding from the Associated Colleges of Illinois, a consortium of private universities.

The APACA model was developed to fit the context of limited funding and time—both known to be constraints on collaboration in CPS schools (and in most other public school systems). It grew out of the research I had done in a study of CPS school libraries a year earlier, in which I had surveyed principals to determine which features of school library programs they felt would have the most positive impact on students in their school. The responses indicated that the largest percentage of

principals ranked "collaboration of the librarian with classroom teachers" as the feature that would have the most impact—even over such features as flexible scheduling, computers, an enhanced collection, a professional librarian, and full-time assistance in the library.[5] The components that make up the acronym for the APACA model include the following:

- **Ask**—The librarian asks a classroom teacher to work collaboratively with her/him to enhance an *existing* unit of study. The two think of ways to incorporate information literacy or library skills into a lesson or unit that the teacher normally teaches alone during the school year.
- **Plan**—The classroom teacher and the librarian reformulate the unit to include the information literacy components and other learning enhancements. The two also spend time identifying additional resources that the library could use to support this unit.
- **Acquire**—The additional resources are acquired for the school library. For both the ILILE grant and the ACI grant, a maximum of $350 per school was allocated for this acquisition. However it is also possible that the additional resources can be borrowed from area libraries through reciprocal agreements or inter-library loan.
- **Co-teach**—The unit is taught by the classroom teacher and the librarian. For this model, it is not necessary that the librarian and teacher be together during the teaching sessions. They do, however, have to be 'on the same page' , so that both know what the other is teaching and each can present lessons that build on what the students have heard or will be hearing in the other class venue.
- **Assess**—Student products from the unit are reviewed to see how effective the enhanced unit has been. The collaborative methodology used by the librarian and classroom teacher is also evaluated to determine how or if it could be improved the next time around.

The test of the APACA model in the initial nine schools proved that it was effective in helping librarians become better collaborators. The collaborative units that librarians chose to work on with their teacher partners covered a wide variety of subject areas and grade levels. Not all of the schools had flexible scheduling, and yet the librarian and teacher were able to allocate the time needed to co-plan the unit.[6]

With my research on the APACA model already underway, it was fairly simple to apply the model to the situation at Vaughn. However, even at this school where the teachers truly wanted their students to avail themselves of what the library had to offer, I had to be proactive in asking teachers to bring classes to the library. I was given time at staff meetings to discuss resources and to encourage library visits. Because teachers didn't know what could be done in the library, I simply told them that I could develop a library lesson around anything they were doing in the classroom—"even math." In some cases, I asked specific individuals to work with me on implementing some of the units that I myself had in mind; all three of the hybrid matrix units mentioned were among those.

Collaborative time spent planning *together* was fairly minimal: after the teachers had explained to me what they wanted their students to do in the library and what was happening in their classroom, the actual planning primarily involved action on my part. My role at Vaughn is to translate what the teacher wants into an activity that can appropriately engage the students during their library session with me. I expect that this is the case for the majority of librarians who have or will be using the APACA model—or any type of collaborative methodology.

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[5] Unpublished findings of "Impacts of CPS Libraries on Student Achievement," P. Foerster, 2003/04.

[6] The Final Narrative Report for this grant is available through the ILILE (contact Christina Sent, ILILE Project Coordinator at csent@kent.edu) or through Dominican University (contact Patti Foerster, Research Associate at foerpatr@dom.edu).

I acquired the books or resources we would need from other libraries or through outright purchase (when I had the funds available). For example, for the Jack-and-the-Beanstalk Matrix unit, I purchased a dozen or so versions of this fairy tale, and I also borrowed multiple copies of the story from neighboring suburban and Chicago libraries. For the Design-a-Dog unit, I borrowed several dozen different books about various dog breeds for our students to use. I also purchased some dog books for Vaughn's library.

These types of collaborative units were invaluable for learning which libraries had resources that were suitable for borrowing, and which resources I would eventually need or like to purchase. Vaughn's collection now reflects to a much greater degree the curricular needs of the students than it did when I first started —although I am aware that we still have a long way to go before we will have acquired all that I would like to see in the library. But it is clear that a corollary phenomenon occurs when you are successful at providing resources to support what teachers are doing in their classrooms: *the more you provide, the more teachers ask you to come up with.* And this is a very good thing. In my own original APACA study, a survey of a small sample of teachers was used to elicit information about why teachers didn't think of using "library" as a subject area for collaboration. More than a quarter of the respondents indicated that the reason was because "the library doesn't have the resources students need."[7] Collaboration allows ideas to be shared about library resources to ensure that the library *does* have what students need.

For the *co-teaching* phase of the APACA collaborations at Vaughn, teachers were always with me when their classes came to the library. I was essentially the "lead" teacher of the team when the lesson was about library skills. In other cases however, there was a 50/50 split between who did what amount of teaching for specific classes. It was also sometimes the case that the teacher actually had the greater degree of input during a class's visit to the library and that my role was more like that of a support resource person in the background. In general, legal class-size restrictions and student/teacher ratios in this special education environment set the parameters for co-teaching to a greater degree than might occur in a general-education high school. That's fine, because although I am fairly comfortable teaching alone in our special education setting, I am nonetheless a brand new teacher, and I welcome all the mentoring and assistance from other teachers that I can get.

Finally, for the *assessment* piece of the APACA model, my thinking has evolved away from using traditional markers of "success" in the library, such as circulation statistics and user visits—or even from the supposition that what I do might somehow affect standardized test scores. As already mentioned, such test scores are not in any way an accurate reflection of growth in student abilities at Vaughn. Then too, because the library is so new and students are basically non-readers, circulation or patron visit numbers would be appallingly low. But as a new teacher in a completely new facility at Vaughn, I need to know the degree to which students understand what I am trying to get across. My concerns about measuring effectiveness are about me as a teacher; my students as special needs learners; and the "library" as it becomes an integral part of the educational framework in this school. I need feedback—and fast.

Vaughn students have difficulties dealing in the abstract or the theoretical. And as mentioned previously, they have limited (but various) reading and writing abilities, and they have difficulties staying on task and being organized. They do however, tend to be highly visual, and although not all students are equally gifted in terms of their artistic abilities, most

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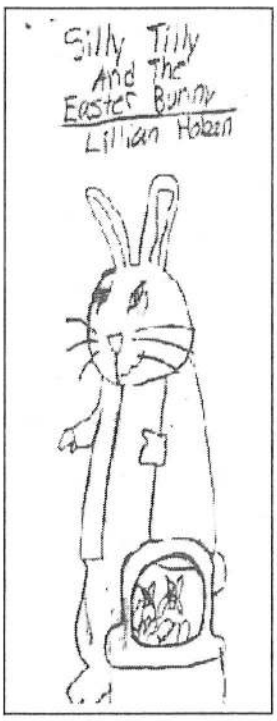
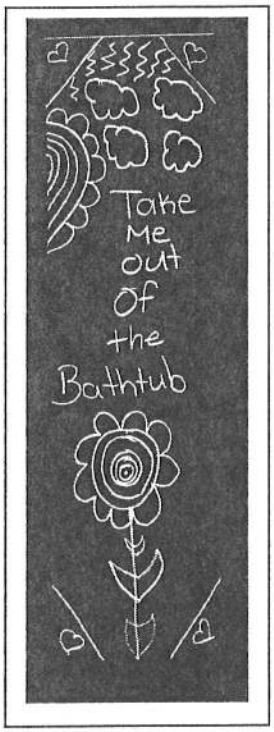
[7] Table 4—Reasons for Lack of Collaboration with Librarian in the Final Narrative Report for *Ask•Plan•Co-teach•Assess (APACA): A Simple, Low-Cost Model of Classroom Teacher/Librarian Collaboration.* See footnote 6.

of these kids become fully engaged when an activity involves drawing, coloring, or using symbols instead of using text words and writing. For example, some of the students who had tried to fill out the "book review" cards shown at the beginning of this paper found the task of writing down their thoughts extremely frustrating. When I offered them the opportunity to create a bookmark that *showed* something about the book instead, the results were interesting and rather charming. Several of these bookmarks are shown following:





Whether Vaughn students—or I myself—operate primarily in a 'visual' and 'kinesthetic' learners modality[8], I need the students to complete activities that result in some sort of artifact when they are in the library, so that these artifacts can help me gauge what the students are understanding. I need the students do something hands-on and manipulative—whether it is folding papers into four squares (*which is truly a difficult task for some of our students*) and then putting a picture or word into each square, or paging through books to find the "Table of Contents" and the "Index"—so that when the movement stops, I can glance around to see if everyone is on the same page with me. Because these kids cannot always organize what they are thinking into appropriate words, I also need a way to see

[8] Two of Howard Gardner's Multiple Intelligences.

if they are 'getting it' even if they are using as few words as possible. And that is why the Matrix Model works well for them.

Matrix Model and 'Ban those Birds!'

When David Loertscher spoke at an in-service training seminar for CPS librarians in April 2005, he shared his view that students in the library need to do more than simple cut-and-paste computer research. While that in itself would actually be a significant accomplishment for many of Vaughn's students, there are other more pressing learning issues that need to be addressed in our library.

Vaughn's students for the most part do not advance to venues of higher education once they graduate from our school. Some students have jobs immediately upon their graduation, but many, sadly, leave the education system with no real plans for the future. As the librarian for these students, it is my responsibility to ensure that when they do leave Vaughn, they have a working knowledge of the various types of information they will encounter in their daily lives. They need to know what kind of information is available 'out there' and where/how to find and use it. While this is not different from what librarians at other schools do, at Vaughn the students do not always have even the most basic awareness of the wide variety of informational resources available. For those students who are in their last year at the school, this may mean that library learning has to start at Square One and then compress into single units what may have taken years for students in other educational settings to absorb.

The Magazine Matrix unit grew out of my need to renew subscriptions in our library and from my awareness that senior-level students should be media literate insofar as magazines are concerned. By creating matrix charts that incorporated various evaluation criteria (e.g., price, number of ads, readability, audience, etc.) that the students filled in, we could effectively kill two birds with one stone. Not only did the unit deal with a true life question that I needed to address (i.e., *Which magazines are really appropriate for our students and thus should be renewed for next year?)*, but it provided a way for students to learn about various magazines and then to visually organize their findings about them into a chart. For more than half of the 30 or so students who completed this unit, this was the first time they have been in Vaughn's library. For equal numbers of them, it was the first time they had seen some of the magazines our library subscribed to. And for virtually all of the students, this magazine unit was the first time they had ever even considered such questions as: What kinds of information are on the front cover of a magazine? What is the difference between an ad and an article? How can ads be helpful? How does the 'table of contents' of a magazine work? What is the benefit of buying a subscription to a magazine? How should we choose which magazines to buy for the library? and on and on.

Loertscher and his colleagues indicate that matrices help students make decisions based on "data rather than on opinions or whims"[9] Students can see patterns and make comparisons when information is organized into a matrix; for special needs students, this is a crucial benefit of using this format. And while the authors of the 'Ban those Bird Units!' stress high quality data in every cell of the matrix, more important to me at Vaughn is simply ensuring that the students understand which kinds of data belong in which cell. I can easily figure out if students understand what they are supposed to be doing, just by looking at how they are filling in their chart. The matrix thus provides a means of assessing understanding on an ongoing basis.

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[9] Loertscher, David et al.. *Ban those Bird Units: 15 Models For Teaching and Learning in Information-rich and Technology-rich Environments* . Salt Lake City, UT: Hi Willow Research and Publishing, 2005.

The students seemed to enjoy filling in the various matrices that were used for the Magazine unit. Once they understood the concept of putting one piece of information into one box, and that each row and column stood either for a different magazine or a different feature of that magazine, they had no trouble working along through this unit. It may even have been the case that completing the particular matrix for the day gave the kids a certain sense of accomplishment.

Details of the various matrices used for this unit are explained in the following section.

Magazine Matrix Unit

The "Magazine Matrix" lessons were used in three senior-level[10] English classes in late May/ early June 2005. The three classes were relatively small, with 8 to 12 students in each. The students came to the library for five days, and they continued to work on this unit in their classroom for two additional days. Nearly half of the students graduated in June 2005. The remaining students came back to the library for another two days (during graduation activities for their classmates) to begin learning Microsoft Excel, which was used to create the various matrices for this unit.

Day 1

Discussion centered on two things: First, what advertising is/does and the kinds of ads the students should be familiar with; and Second, what a matrix is and how it can be used to organize information.

We talked about where and when students see ads. Students volunteered examples, such as on a bus or on the CTA (Chicago Transit Authority) trains, on a billboard, in the movie theater before the movie starts, on TV, and on the computer. We talked about how magazines also have ads, and students were given copies of *Jet, US Weekly,* and *Hot Rod* to look at while we talked. (Seeing these magazines was a "first" for some of the students.) Students were asked to identify what was on the front- and back-inside covers of one of their magazines. On the board, we listed the kinds of ads that students found (e.g., cigarettes, cat food, alcohol, makeup, various kinds of cars, a cable TV station, etc.). We talked about whether the students "liked" the ads; about products they themselves were likely to purchase; and about how advertising can sometimes be useful.

In order for students to fill out the first matrix (see below), they had to have some knowledge of the "subscription" and "cover" prices charged for magazines. (These concepts were yet another "first" for virtually all of these students.) We showed the students where and how to find this information. We then discussed whether the cover price or the subscription price would provide the best value—but we also talked about the difference between paying 'up front' vs. spreading costs over time. Students also needed to know how to "tally" as a way of simplifying their counting. This process was reviewed so that they could complete the Magazine Matrix. A sample matrix is shown below, as filled in by a student.

[NOTE: All matrices have been greatly reduced in size to fit into this document. Vaughn's students find large, bold fonts and lots of white space the most comfortable for writing. All of the matrices were printed on 8 ½ X 11-inch paper.)

[10] Although students may be considered to be at the senior-level at Vaughn, they may actually be 5th or even 6th year students. These students are also called "Senior Seminar" students because their final year(s) at Vaughn focus more fully on occupational training, which is taught in a seminar format.

Matrix 1 – Day 1 of the Magazine Matrix Unit. This first matrix was used to help students understand how to use matrices for organizing information. The class worked on this matrix as a group.

Magazine Matrix

Magazine Name	Cover Price	Subscription Price	Number of Pages	Number of Pages With One or More Ads
JET	$1.50	$24.00	66	27
US Weekly	$3.29	$1.29	116	52
Hot Rod	$3.99	$12.00	154	78

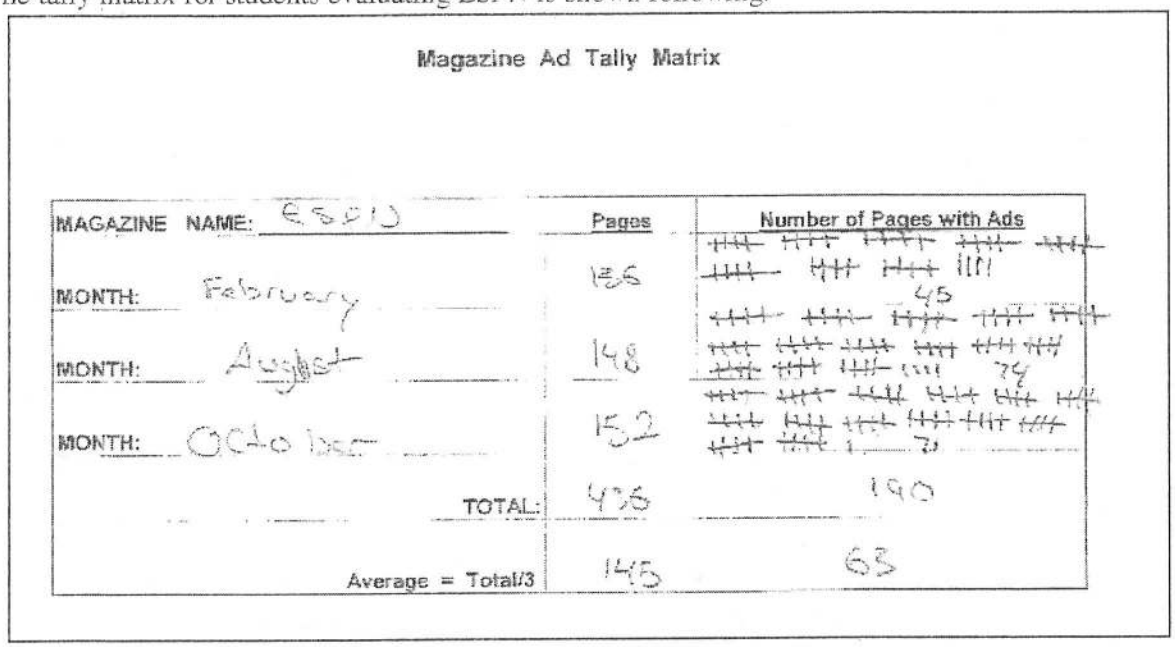
Days 2 and 3

The goals on Days 2 and 3 were to: First, reinforce the idea of using a tally for counting; Second, reacquaint students with "averages" (calculators were available); Third, help students recognize ads in various types of magazines; Fourth, have students practice filling in a matrix; Fifth, have students work together to complete an assignment; and Sixth, let students experience navigating to and around two different websites.

Students were divided into small groups (two or three students per group). Each group was given two sets of magazines that they would evaluate. The two kinds of magazines were similar, e.g., *Elle Girl* was paired with *Cosmo Girl; Sports Illustrated for Kids* was paired with *ESPN; Hot Rod* and *Motor Trend* were paired; *Ebony* and *Essence* were paired, etc.. To the extent possible, all groups of students were given magazines from the same three months to help negate seasonal differences in advertising levels.

In addition to their sets of magazines, the students were given two new matrices to fill out—one matrix for each kind of magazine that they had. The students had to go through all three months of their particular magazines to see how/if the number of ads fluctuated by season, and to come up with an average number of ads for each kind of magazine. One person in the group was supposed to turn the pages in the magazines and look for ads, and the other person was the "tally" keeper. Students were to take a turn at doing both functions. Groups could work at their own pace.

The tally matrix for students evaluating *ESPN* is shown following.



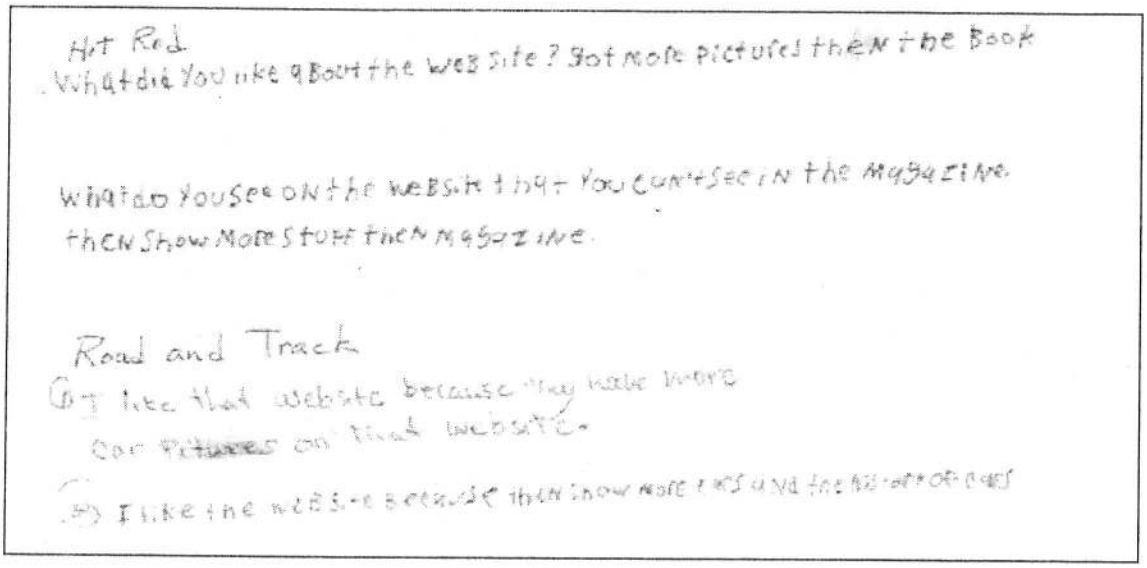
Magazine Ad Tally Matrix

MAGAZINE NAME: ESPN	Pages	Number of Pages with Ads
MONTH: February	125	45
MONTH: August	148	74
MONTH: October	152	71
TOTAL:	425	190
Average = Total/3	145	63

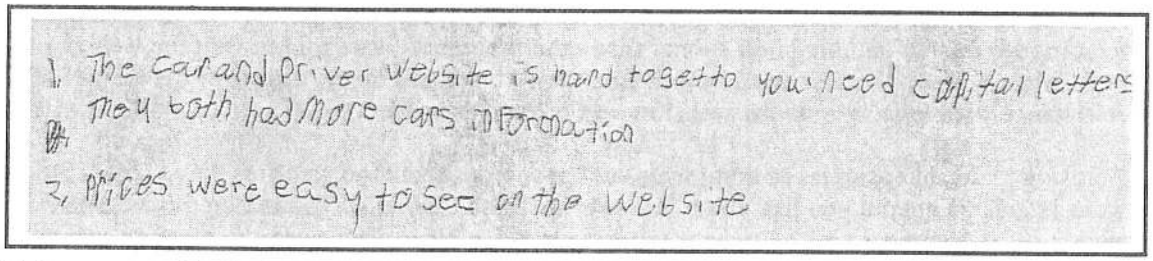
Magazine Ad Tally Matrix–The students that worked on *ESPN* magazine also evaluated *Sports Illustrated for Kids*.

While the students completed this set of matrices, my co-teacher and I circulated to be sure that the students knew what they were supposed to do—and especially to verify their understanding of "ads" vs. articles. We also could readily tell if the students knew how to come up with the averages required to fill out their matrix; we gave assistance as needed. Because a few of the groups were able to complete this ad-counting task sooner than others, students were told to visit the websites for each of their magazines. We discussed how to find the web address on the covers of the magazines. Assistance with logging onto the websites was offered as needed.

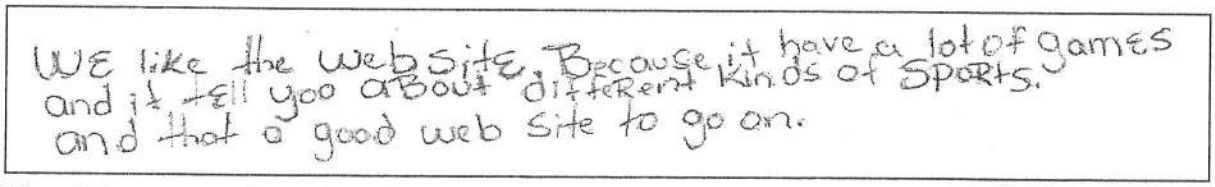
Below are several examples of comments students wrote about the websites they visited. Students were asked, "What did you like about the website?" and, "What do you see on the website that you cannot see in the magazine?" Students were expected to get to the site and to maneuver to one or two of the corresponding pages that interested them.



Website comments for the *Hot Rod* and *Road and Track* magazine websites. Two students took turns writing the comments. The *Hot Rod* comments read, verbatim: "1. What did You like aBout the WeBsite? got more Pictures theN the Book What do you see oN the WeBsite that you caN't see iN the MagaziNe. theN show more stuff theN Magazine." Comments for *Road and Track* read, verbatim: " (1) I like that Website because they have more car Pictures on that website. (2) I like the weBsite Because theN show More cars aNd the history of cars."



Website comments for the *Car and Driver* and *Motor Trend* websites, which read, verbatim: "1. The Car and Driver website is hard to get to You need capital letters They both had more cars information 2. Prices were easy to see on the website"



The website comments for the *Sports Illustrated for Kids* website read, verbatim: "We like the website Because it have a lot of games and it tell yoo aBout different kinds of sports. and that a good web site to go on."

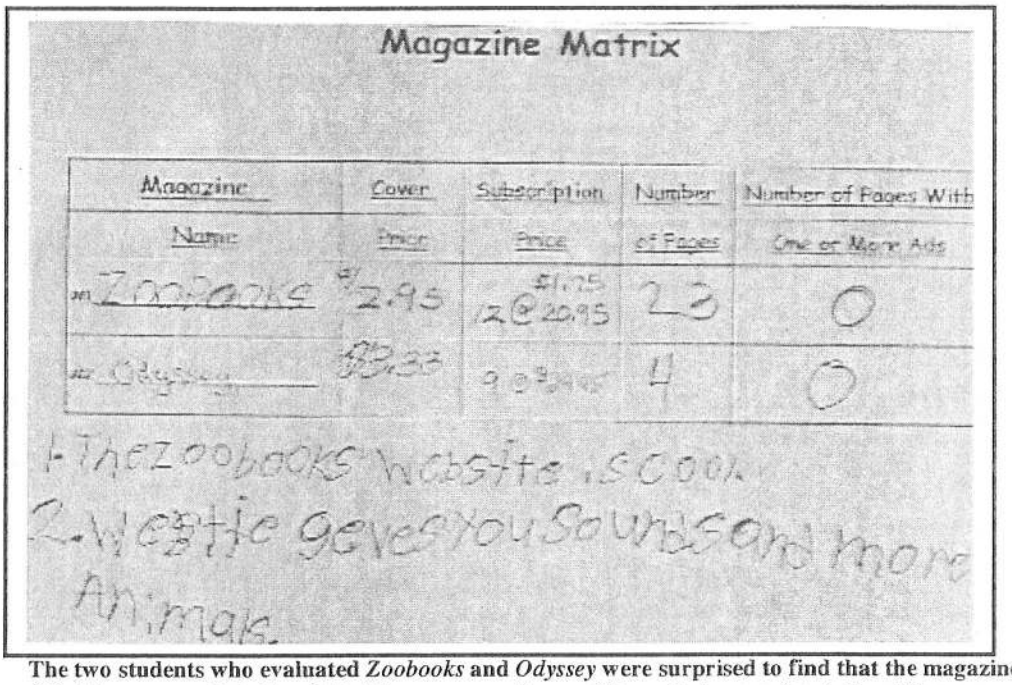
Days 4 and 5

The goal on Days 4 and 5 was to have students gain additional practice filling in a matrix. This time, however, information from their prior matrices had to be transferred onto a new matrix. Students also

had to think more expansively in order to fill out this matrix: They were asked to determine who the audience for their magazine would be and how hard it was to read.

Again, while students completed this "pink" magazine matrix, my co-teacher and I worked with individual groups as needed. In order to determine the readability of the magazines, the students had to actually try to read an article. They could answer separately whether they thought the article was "hard" or "okay" to read (see the Side 2 example shown below). Although I generally gave the boys the sports and car magazines to evaluate, a few of them did spend some time looking through the entertainment magazines as well. The girls, however, were not interested at all in the sports or car magazines.

(Side 1 of matrix)



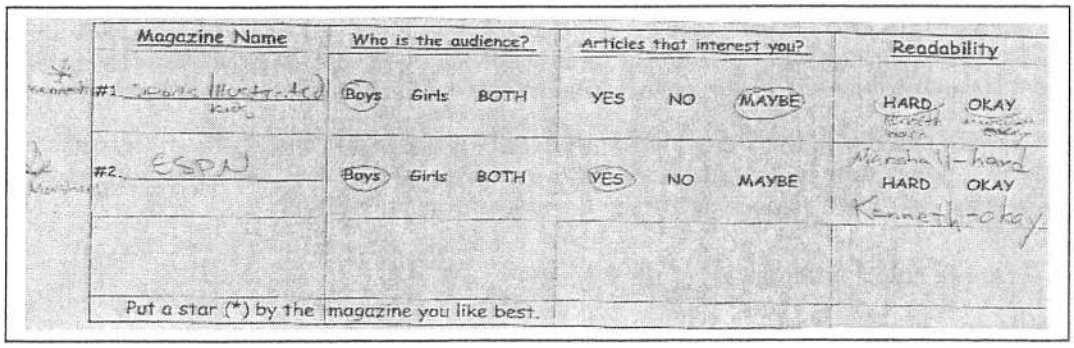
Magazine Matrix

Magazine Name	Cover Price	Subscription Price	Number of Pages	Number of Pages With One or More Ads
#1 Zoobooks	$2.95	$1.25 12@20.95	23	0
#2 Odyssey	$3.33	9 @ $3.95	4	0

1-The Zoobooks website is cool.
2-Webstie geve you sounds and more animals.

The two students who evaluated *Zoobooks* and *Odyssey* were surprised to find that the magazine didn't have any ads in it and that there was no discount for ordering a subscription. The comments on the two websites are also shown on this matrix, because these students did not work quite as fast as some of the other teams. The *Zoobook* comments read, verbatim: "The Zoobooks website is cool." The *Odyssey* comments read, verbatim: "Webstie geve you sounds and more animals."

(Side 2 of matrix from another team of students)



Magazine Name	Who is the audience?			Articles that interest you?			Readability	
#1 Sports Illustrated Kids	(Boys)	Girls	BOTH	YES	NO	(MAYBE)	(HARD)	OKAY
#2. ESPN	(Boys)	Girls	BOTH	(YES)	NO	MAYBE	Marshall-hard HARD	OKAY Kenneth-okay

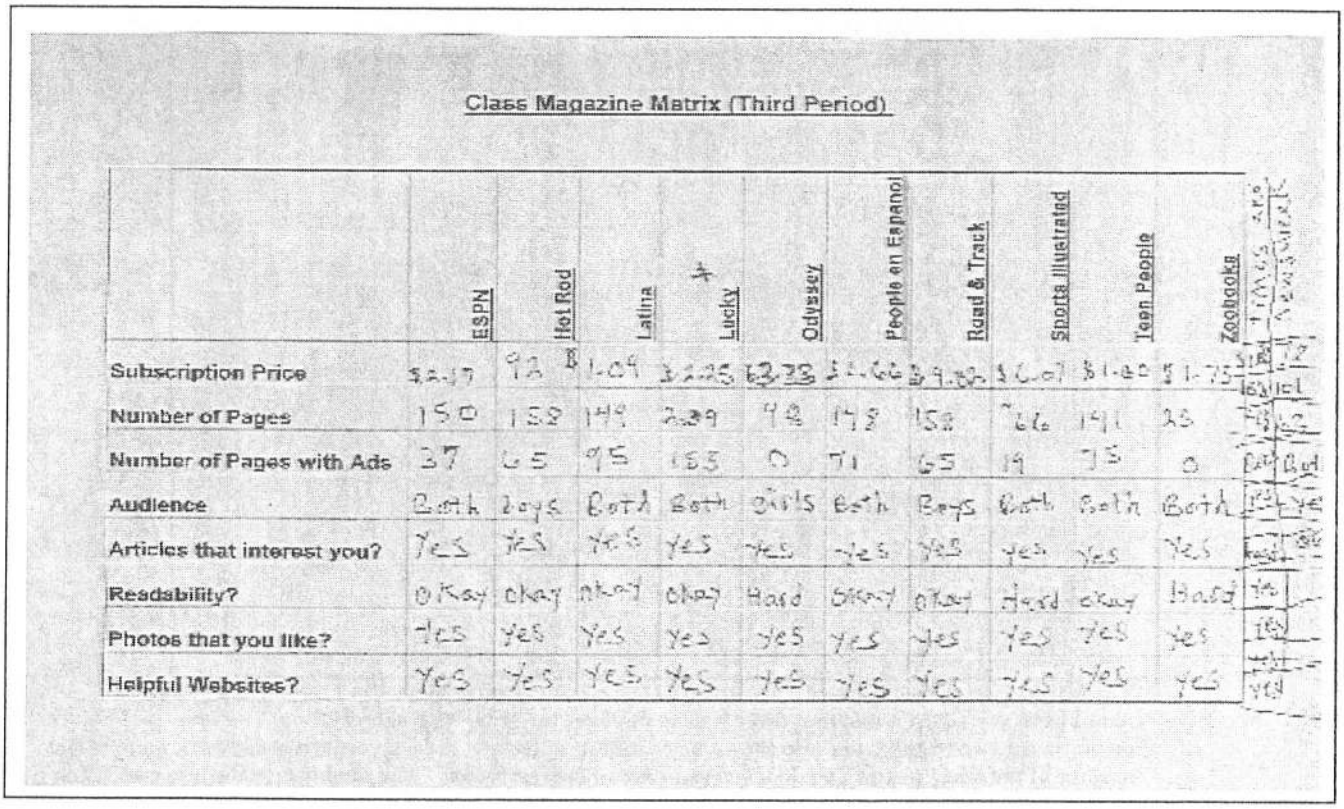
Put a star (*) by the magazine you like best.

Even though Kenneth found *Sports Illustrated for Kids* "Hard" to read, he still liked it better than *ESPN*, which was "Okay" for him to read. On the other hand, Marshall found *ESPN* "hard" but he liked it best compared to *Sports Illustrated for Kids*, which had an "okay" readability for him.

Day 6 (in the classroom instead of the library)

The goal on this day was for the students to combine all of the information they had gathered by teams, and put it onto one giant matrix.

I met with the classes on this day in their classroom because of some scheduling issues with the library. On an overhead projector, I showed the students a matrix that contained spaces for each of the magazines that their particular class had evaluated. Together, we worked to fill in the various boxes until the matrix was complete. Each student was given a copy of the sheet to fill in as we worked. The finished matrix, completed by one of the students, is shown below.



Class Magazine Matrix (Third Period)

	ESPN	Hot Rod	Latina	Lucky	Odyssey	People en Espanol	Road & Track	Sports Illustrated	Teen People	Zoobooks
Subscription Price	$2.99	$2	$1.09	$1.25	$3.25	$1.66	$2.99	$1.00	$1.25	$1.75
Number of Pages	150	152	149	209	98	178	158	166	191	35
Number of Pages with Ads	37	65	95	155	0	71	65	19	75	0
Audience	Both	Boys	Both	Both	Girls	Both	Boys	Both	Both	Both
Articles that interest you?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Readability?	Okay	okay	okay	okay	Hard	Okay	okay	Hard	okay	Hard
Photos that you like?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Helpful Websites?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This is the Class Magazine Matrix for the 3rd period English class—as filled out by the student who evaluated *Lucky*. This student was able to add the additional matrix spaces needed to incorporate two other magazines, *Time* and *Newsweek* into the matrix. For these students, getting to this point in the Magazine Matrix unit was a tremendous accomplishment. Although some of the numbers and preferences do appear questionable, we charted whatever the students themselves came up with. In another venue, I would ask for students to challenge some of the findings.

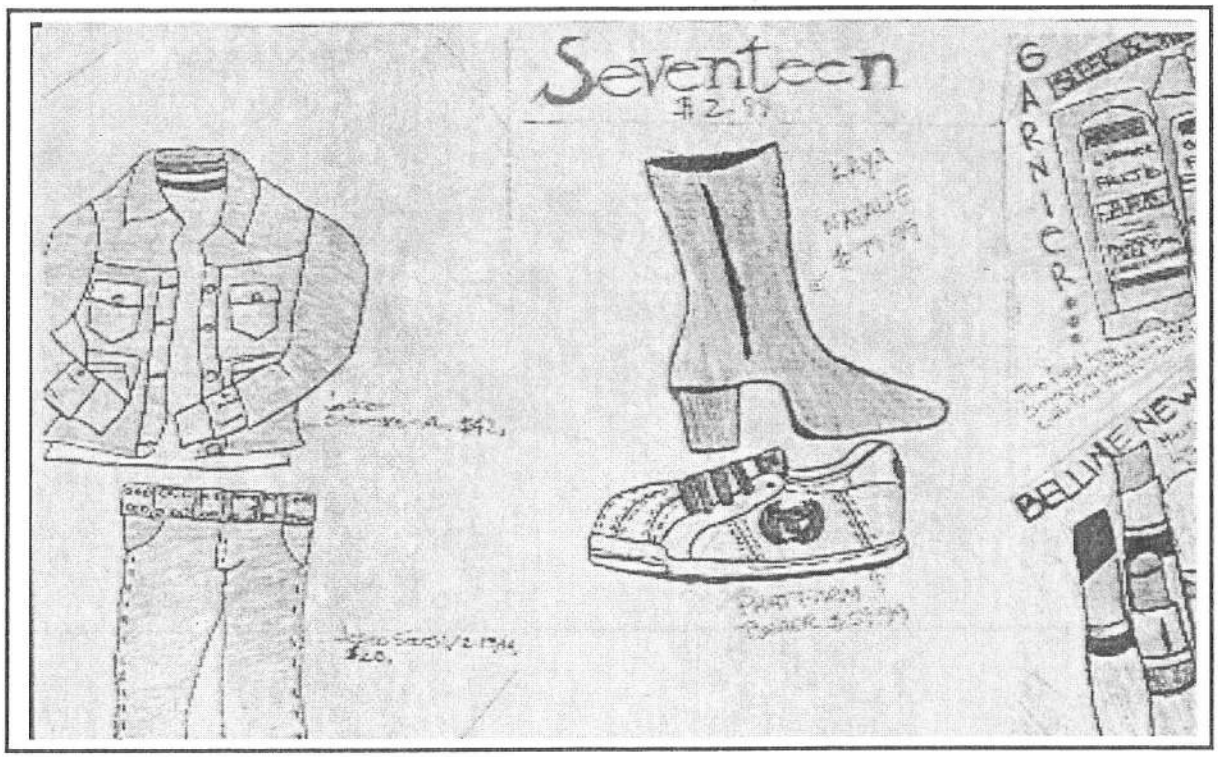
After we had completed the Class Matrix, students were asked to specify their preferences. On the overhead, I put a "star" by the magazines they indicated. In renewing the subscriptions, I tried to keep as many of the magazines chosen by the students as possible.

Day 7 (in the classroom instead of the library)

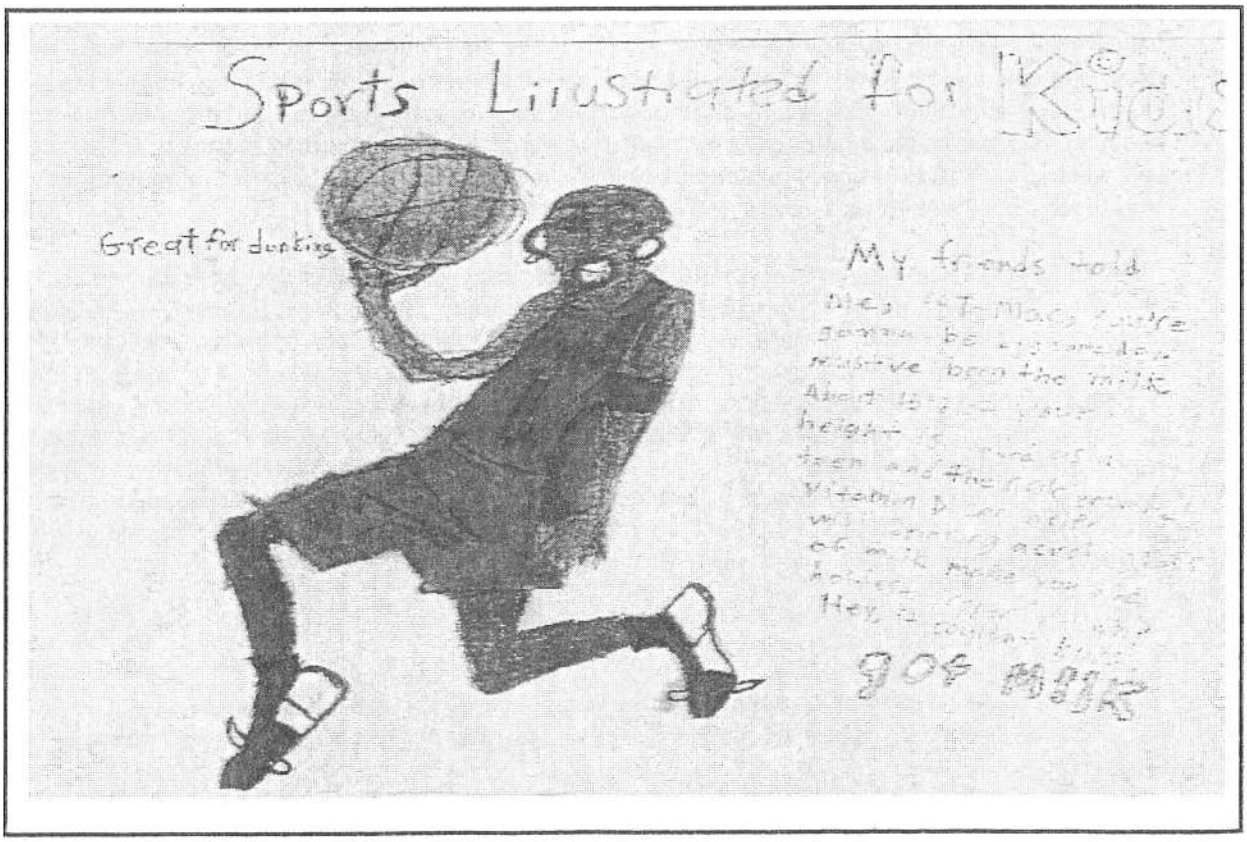
As the "culminating" activity for this unit, the students were asked to create an ad that would either sell the magazine they liked the best, or sell a product in that magazine. The goal was to give the students a way of expressing their ideas about advertising and magazines. Each student was given a large sheet of construction paper to work on, and they used colored pencils to color their artwork.

Here are several samples of the ads Vaughn students created.

Ad for *Seventeen* Magazine



Ad for *Sports Illustrated for Kids*



Caveats and Questions

The American Association for Higher Education indicates that assessment is most effective when it tests learning as "revealed in performance over time [so that] change, growth, and increasing degrees of integration" can be seen.[11] When I think back about where the students began with this Magazine Matrix unit—considering especially that some students had never been to Vaughn's library before, and none of them had ever attempted to "evaluate" a magazine and put their results into chart form—and where they ended up—with a complex matrix that showed data on 12 different magazines, and beautifully illustrated advertisements—I am pleased with the results.

I know that *while these kids were working on this unit*, they grew in their understanding of magazines and they became at least somewhat media literate: They learned things they didn't know, such as cover prices, subscriptions, ads, kinds of articles, audiences, and websites. They also revisited some math activities they may have already learned, such as how to do tallying, and how to find an average. They became familiar with a new organizational method—the matrix—and they practiced charting data until they could complete a huge and complex matrix that used information from teams of their classmates. Finally, they showed their creativity by developing an ad that they thought would convince someone to buy their favorite magazine or a product in that magazine. All this I know took place for these kids last May and June, and I could see their understanding evolve as the unit progressed. I have the artifacts to prove it.

[11] Astin, Alexander et al.. "9 Principals of Good Practice for Assessing Student Learning" on the American Association for Higher Education website, http://www.aahe.org/assessment/principl.htm , accessed on 6/11/2003.

But these *are* special needs kids. I don't know how much of what these students learned during the Magazine Matrix unit they will remember. They have cognitive disabilities that limit the retention of knowledge they may have previously gained. Their processing capabilities constrain what will stay in their head and what will have to be learned again, and again, and then again over time. The classroom teacher that I worked with on this unit retired at the end of June last year, so I can't ask her what she thinks these students still know from what we taught them. Then too, many of these students graduated in June so they aren't around to ask anymore either.

But some of these students will be returning to Vaughn with the new school year. Some of them will eventually drift into the library, and I will be curious to know what they think of our collection of magazines going forward; I would like to see who can still fill out a matrix—especially under alternative circumstances, such as in a unit that deals with something altogether different from what was already covered in the magazine unit. Would these students be able to devise a matrix on their own, if they had some form of data that needed to be compared? Could they point to the place in a magazine where the subscription price can be found if their mom or dad wanted to buy the subscription for them? Do they still know how to tally? Can they tell the difference between an ad and an article? Do they remember how to find out where the magazine's website is?

Maybe it isn't quite reasonable to expect that these special needs students could retain the information they learned about matrices and magazines over the long term—or even over the summer. And of course it isn't appropriate to place the burden of assessing the level of information retained on the standardized tests these students will take later during their school year. But what about kids who aren't cognitively disabled? How would we track the 'library' learning that they retained? What should we be using to assess, further down the road, their understanding of the skills they were taught in the library? Can we really assume that standardized test scores represent a snapshot of what even these students learned from us—or are connected in any way to whatever information literacy skills they may have gained? Supposedly, the best forms of assessment are ongoing—not episodic.[12] But how can we as librarians, for any and all types of students, track our effectiveness both while we are teaching and later on when the students are out from under our influence?

I don't have the answers yet. I know what seems to work with my students at Vaughn Occupational High School in Chicago. But I'm not even certain of the results beyond what I taught before the summer. I can't say for sure that any of the students who were with me when we did the various hybrid matrix models still even know what a matrix is or how it is useful. I'll be pursuing the answer to that in the coming months during the course of the 2005–2006 school year. And I am assuming that there are researchers and practitioners in the broader realm of school librarianship who know a great deal more about effective assessments than I do. I welcome their input.[13]

Source List

Astin, Alexander W. et al. "9 Principals of Good Practice for Assessing Student Learning," on the American Association for Higher Education website, http://www.aahe.org/assessment/principl.htm, accessed on 6/11/2003.

Foerster, Patrice. "*Ask •Plan •Acquire •Co-teach •Assess (APACA): A Simple, Low-Cost Model of Classroom Teacher/Librarian Collaboration*" Final Narrative Report to the Institute for Library and Information Literacy Education (ILILE), Kent State University, Kent, OH, 2004.

Foerster, Patrice. "Impacts of CPS Libraries on Student Achievement," unpublished research data, 2003/04.

Loertscher, David et al.. *Ban those Bird Units: 15 Models For Teaching and Learning in Information-rich and Technology-Rich Environments*. Salt Lake City, UT: Hi Willow Research and Publishing, 2005.

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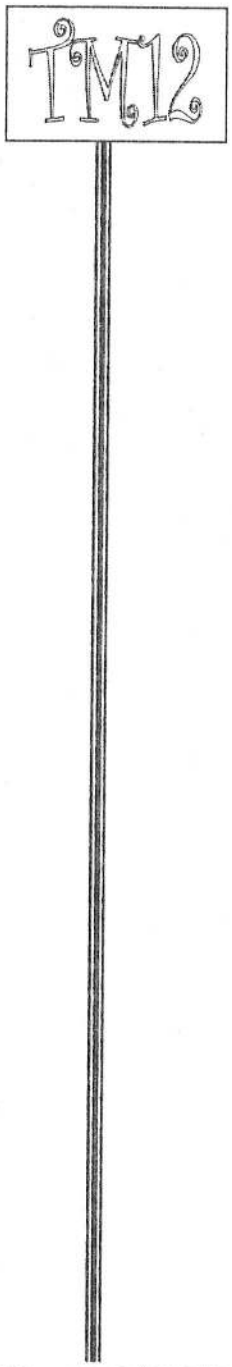
[12] Astin et al, Ibid.

[13] Email address at Vaughn Occupational High School: pfoerster@cps.k12.il.us



Backward Design, Big Ideas, and Anchors in Pennsylvania Schools Can Lead to Increased Collaboration Between School Library Media Specialists and Classroom Teachers and to Increased Free Voluntary Reading Among Students

A Proposal Based on Understanding by Design

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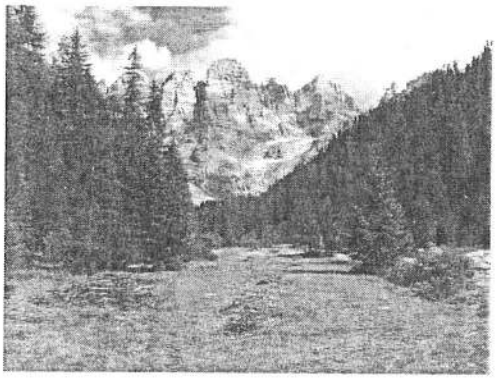

Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Introduction

Since the onset of academic standards and the emphasis on standardized testing in Pennsylvania (PSSA), this writer has been collecting anecdotal evidence from Pennsylvania school library media specialists (SLMSs) regarding the effect that "teaching to the standards" and "teaching for the test" have had on the willingness of classroom teachers to collaborate with them on units of instruction.

This anecdotal evidence has been collected from SLMSs in various library regional groups in which this writer has consulted and conducted inservice workshops, from pre-service SLMSs at Clarion University's library school who are conducting field experiences and student teaching in a variety of schools, and from SLMSs across Pennsylvania during the annual conference of the Pennsylvania School Librarians Association (PSLA), where this writer was serving as conference chairperson.

The apparent conclusion that can be drawn is that classroom teachers, who have been placed in positions where academic performance is so critical and so spotlighted, have become increasingly less willing to collaborate with their SLMSs on units of instruction because they are so concerned with meeting the academic standards and preparing for the PSSAs and covering the material in the textbook. The focus seems to be on testing and on coverage of the text rather than on asking big questions that students can research in collaboration with the SLMS. This is not the fault of any teacher, just, according to Blanche Woolls, the fact that "the education environment today is one of economic concerns." (2004, 6)

Regardless of the environmental scan, some Pennsylvania SLMSs have been experiencing a great deal of frustration over the decrease, in some cases, of the levels of collaboration with their teachers. However, Wiggins and McTighe's plan for understanding by design combined with Pennsylvania's recent shift away from detailed and specific academic standards to "adopt-an-anchor" (focused on mathematics and reading) may very well provide the answer that Pennsylvania SLMSs have been seeking to increase collaboration with their classroom teachers and to increase free voluntary reading (FVR) among their students.

Continued importance of collaboration

The discussion of the role of the SLMS as collaborator began with the publication of the first Information Power in 1988. (AASL and AECT) A multitude of articles, theses, and dissertations were written during the 1990s that brought attention to the changing role of SLMSs and how it would ultimately affect their work with students and teachers. Among the publications during that time were those of Anderson (1995); Aronson (1996); Bardak (1994); Baumbach (1996); Barron (1993); Bell (1990); Berkowitz, Stoner, and DonVito (1994); Bishop and Blazek (1994); Buchwald (1995); Carter (1992); Cleaver and Taylor (1989); Dovin (1993); Eisenberg and Berkowitz (1988); Getz (1991); Giorgis (1994); Green (1993); Grover (1991); Hambleton and Wilkinson (1994); Haycock (1990); Jay and Jay (1994); Jones (1994); Kinnucan-Welsch (1995); Kuhlthau (1993); Kutiper and Wilson (1994); Lance, Welborn, and Hamilton-Pennell (1993); Lewis (1990); Loertscher (1988); McGregor (1993); Meckler (1994); Miller (1997); P. Montgomery (1989); R. H. Montgomery (1995); Nalwasky (1990); Person (1993); Pickard (1993); Pitts (1994); Shontz (1994); Smith (1995); Tallman (1995); Tallman and van Deusen (1994); Todd (1991); Turner (1993); van Deusen (1996); van Deusen and Tallman (1994); Weaver (1994); Wehmeyer (1993); Wellham (1995); and Woolls (1994). Some of these writers discussed the changing role of the SLMS using the term "collaborator" or "cooperator" while others, employed terms like "instructional consultant." Nevertheless, the intent was the same. All of the school library profession was abuzz at the time with the excitement of the increased involvement of the SLMS in instructional design and in teaching and evaluating learners.

Since the publication of *Information Power: Building Partnerships for Learning* in 1998 (AASL and AECT), the focus on SLMSs as collaborators has continued to be important in the literature. The discussion of the importance of collaboration with the publication of *Information Power* in the last decade

has been followed up by evidence in this decade, begun in 1993 by Lance,Welborne and Hamilton-Pennell, that SLMSs who collaborate with their classroom teachers on instructional design and in teaching and assessing students make a difference in boosting students' academic achievement. (Loertscher and Todd 2003, 35) Within ten years of the first study that was conducted to determine what, if any, effect school libraries and SLMSs have on students' academic achievement, the research is replete with clear evidence that SLMSs and school libraries "power achievement." (Lance and Loertscher 2005)

Therefore, the vitality and importance of SLMSs collaborating with their classroom teachers is today as critical and powerful as it was thought to be fifteen years ago. The resulting effect for students is increased academic achievement, and nothing trumps that result.

Noted importance of free voluntary reading (FVR)

The responsibility for teaching reading and for improving students' abilities to read and read well lies with all educators. SLMSs, however, have a particularly powerful position because they develop collections for students to read and provide reading guidance as well. And while SLMSs and their collections and programs *could* be improving students' abilities to read, according to *The National Education Goals Report: Building a Nation of Learners 1997* (Woolls 2004, 5) reading achievement for students in grade twelve were in decline. Because of that decline, more standards and testing have been legislated through "No Child Left Behind."

As a result, anecdotes, similar to those described previously, exist that this writer has collected concerning the increased difficulty for SLMSs to locate willing teachers with whom they can collaborate relating to students' reading less in Pennsylvania due to an emphasis on standardized test preparation. These anecdotes are of great concern, for it has been well documented by Stephen D. Krashen in *The Power of Reading* (2004) that nothing creates better readers than reading and no method is better for improving reading than that of free voluntary reading (FVR). In other words, if a student simply reads whatever she wishes (and plenty of it), she will increase her reading level automatically. Of course, what sometimes is missed in the discussions of preparing students for reading tests is that FVR will, by definition, increase students' scores on reading tests without having to fight them to read specific materials or to take specific tests on each item that is read. AASL has published, "It's arguable that children who like to read, who read willing and joyfully also tend to read better. Good library programs bolster the efforts of the classroom teacher and reading teacher. . . ." (*Your School Library Media Program* ... 2004, 2)

Current Pennsylvania educational landscape

The current Pennsylvania educational landscape that provides the backdrop for educators to collaborate and for students to read to achieve is likely not all that different from many other states. The focus is on ensuring meeting academic standards so that "no child is left behind." The result, it would seem, is that there are children being left behind, along with their SLMSs. According to AASL, "Short-term fixes like adopting a new basal reading series, teaching students test-taking skills, giving practice tests, and making sure everyone is well-fed and rested on test day are popular. But smart schools are discovering that simply increasing standard reading instruction and "test prep" do not work with many children nor do they have a long-term impact, and they are looking for other strategies." (2004, 2)

The tide in Pennsylvania, however, may be turning a bit with the adoption of mathematics and reading anchors where the responsibility to teach mathematics and reading is expected to cross all disciplines and to be tied into the current Pennsylvania academic standards. (Pennsylvania Department of Education (PDE) 2005; Pennsylvania Department of Education, Bureau of Assessment and Accountability 2004) According to PDE, "The Assessment Anchors are one of many tools that the Department believes will better align curriculum, instruction and assessment practices throughout the state." (PDE 2005, 2) These sets of anchors are the Department's response to teachers' requests for clarification of the Pennsylvania academic standards—thirteen in all. The current standards are in specific subject areas, including arts and

humanities; career and education and work; civics and government; economics; environment and ecology; family and consumer sciences; geography; health, safety, and physical education; history; mathematics; reading, writing, speaking, and listening; science and technology; and, world languages. Pages and pages of standards exist for each of the thirteen standards and many are broad and a bit difficult to puzzle out.

Additionally, the anchors were established to clarify issues surrounding the current assessment used in Pennsylvania—the PSSA. "The Assessment Anchors clarify the standards assessed and the PSSA and can be used by educators to help prepare their students for the PSSA. The metaphor is simple: the Assessment Anchors are designed to hold together or 'anchor' both the state assessment system and the curriculum/instructional practices in school." (PDE 2005, 2) The clever SLMS will, of course, be prepared to point out that the school library media program is the source of such an anchor as well for all curricular areas. According to the Department's Bureau of Assessment and Accountability, the load for English and mathematics middle and high school teachers is too great to bear in order to meet required goals for annual yearly progress (AYP). Therefore, teaching reading, writing, and mathematics across the curriculum will assist in distributing the load. (PDE, Bureau . . . 2004, 2) The assessment bureau's goal is to have all content areas "adopt-an-anchor" "while preserving—even enhancing—the heart of each content area." (PDE, Bureau . .. 2004, 3) The process is a matter of identifying natural fits throughout the curriculum for the anchors, then of matching alignment of the anchors to the PSSA's areas of proficiency, and finally, of adopting the "orphan" anchors that no one seems to have covered. These "adopt-an-anchor" programs should be done on a school-by-school basis. The anchors are, however, readily available on the Department's webpage at http://www.pde.state.pa.us. An entire toolkit has been developed by the Bureau, including a PowerPoint presentation for training, index cards, plastic banners to chart anchors' adoptions, tracking sheets, and more.

This approach to adopting anchors is similar to that taken by AASL and local states after the publication of the information literacy standards in 1988 in *IP II*. Instead of having teachers work separately, the suggestion is to work collaboratively to teach more big ideas instead of focusing on coverage. The good news is that reading assessment anchor 1.8 is research! Wiggins and McTighe work with understanding by design seems only a heartbeat away from what is only now occurring in Pennsylvania.

Backward Design

Wiggins and McTighe's instructional design model, understanding by design, is often referred to as "backward design" because "designing lessons for understanding begins with what we want students to be able to do and proceeds to the evidence we will accept that they have learned it. Only then does it turn to how they will learn it." (R. Brandt in foreward to Wiggins and McTighe 2001, vi) In other words, many times educators start with the performance that they wish their students to perform, then decide exactly which standard or proficiency that it will meet. Wiggins and McTighe work backwards from the standard to the performance, with plenty of room along the way for lesson development and use of resources. The design suggests that educators look at writing curriculum "from the learner's point of view and the desired achievements." (Wiggins and McTighe 2001, 4) A significant difference in their perspective to instructional design lies in their definitions of "content standards" and "performance standards." Some educators have a tendency to think of these synonymously; however, Wiggins and McTighe do not. According to them, "Content standards specify the inputs—What is the content that should be covered? Performance standards specify the desired output—What must the student do, and how well, to be deemed successful." (Wiggins and McTighe 2001, 4)

The discussion of these two terms naturally brings the reader to questioning the word "understanding" in their model. While most of their book is devoted to the discussion of the term, it means simply "that a student has something more than just textbook knowledge and skill [when they understand]—that a student really 'get's it'." (Wiggins and McTighe 2001, 5) In 1997, Miller said, when writing about the importance of collaboration in a school library media program, "that knowledge [understanding] is not segmented by subject area. If students are going to translate fragments of content into knowledge, they must experience curricula in a cohesively-related interdisciplinary fashion." (Miller 1997, 3) Thus, it is

easy to make the leap from the philosophy behind backward design to the philosophy behind collaborative instructional design in the school library media center.

In order to successfully utilize backward design, this writer highly recommends *Understanding by Design: Professional Development Workbook*, which clearly illustrates by utilizing excellent examples how a teacher can take any unit of instruction and modify it with backward design. (2004) The result is that the educator must ask herself at the beginning of the unit what *exactly* it is that she wishes the learners to understand. From that, essential questions, "big questions," will arise that will provide a structure for the entire unit. (These big questions are very similar to the types of questions that Jamie McKenzie suggests that SLMSs should ask their students.) (2005) The expanded 2nd edition of *Understanding by Design* (2005) provides a template for unit design, along with the accompanying exposition of the first edition. To read and study the results of research conducted by users of understanding by design, interested persons should consult John L. Brown's book *Making the Most of Understanding by Design.* (2004) As a result of Brown's research, readers learn the successes and the pitfalls of the instructional design process and can emphasize the patterns and avoid areas that are not as successful.

The SLMC and backward design

Backward design, proposed by Wiggins and McTighe, is a good fit for the instructional planning process of the SLMS because theirs is an instructional design process that focuses on big ideas, research, and use of resources beyond the textbook, which SLMSs have been doing all along as they employ the research process to all parts of the curriculum. Use of backward design may also produce more collaborative incidences for SLMSs as well for the reasons that follow.

Backward design focuses on:

- Active inquiry and uncoverage ("inquiring into, around, and underneath content instead of simply covering it") (2001, 98), not just covering the textbook. They suggest going beyond the textbook to see "what lies beneath the text." (2001, 103) This kind of uncoverage could lead to greater levels of collaboration between SLMSs and teachers as well as more being read by students. Wiggins and McTighe have a big problem with only "covering" the what is in the textbook. They write, "... when students are taught only from textbooks and receive only the agreed-upon residue of inquiry, they mistakenly believe that technical subject-matter knowledge is simply 'there'—obvious and unproblematic, if they just look real hard or concentrate." (2001, 107)

- A questions "that focus learning . . . [and] make all subject-knowledge possible. (2001, 33) Questions also "frame and structure the lessons and give rise to appropriate research, note taking, and final performance." (2001, 32)
- a student's ability to explain what he is studying by providing supporting data and accounts (2001, 44) A student must be able "to show their work, not just give an answer; and to support their conclusions." (2001, 47, 76)

- asking educators to ask themselves what "learning experiences and teaching promote understanding, interest, and excellence" and then create "research-based repertoire of learning and teaching strategies" (2001, 64)

- "touchstone tasks"—"the most important performances than can fruitfully be used over time to assess enduring understandings and core processes, or abilities such as effective writing, research, problem solving, and oral communication." (2001, 86) These are some of the purposes of Pennsylvania's reading anchors as well. It would be quite easy for Pennsylvania schools to adopt backward design since they are already adopting anchors in both reading and mathematics

that will provide "touchstone tasks" for all students. The relationship between adopting an anchor and providing students with touchstone tasks is very close. The work of the SLMS is really the other "anchor" in providing these touchstone tasks since the "enduring understandings and core processes" are those taught by the SLMS in the continuum of information literacy.

- providing experiences for students that are engaging. These experiences should "allow them to explore the big ideas and essential questions and cause them to pursue leads or hunches, research and test ideas." (2001, 116)

For any reader, it is apparent that school libraries and SLMSs can provide what it takes to utilize understanding by design, for SLMSs are the masters of active inquiry, of going beyond the textbook to rich resources, of asking the big questions that lead to research, of providing primary sources, of teaching research, of the identified "touchstone tasks," and of providing engaging experiences that lead to research. All of these will provide additional opportunities for SLMSs to collaborate with classroom teacher.

Additionally, in Pennsylvania, at least, the adoption of anchors may bring more opportunities for SLMSs to collaborate with classroom teachers. According to AASL, "School library media specialists, by designing teaching information literacy units tied to the classroom curriculum, help all students learn to not only memorize information, but also to use it in meaningful and memorable ways. Which, of course, leads to higher test scores. We want to produce critical readers, real-world math users, and passionate effective writers." (*Your School Library Media Program . . .* 2004, 3)

Increased collaboration and increased free voluntary reading, backward design, and anchors—Does a relationship exist among them?

The response to the question is a resounding affirmation for the following reasons:

- SLMSs typically begin with the end in mind; they start with the teachers' goals and objectives, or academic standards and then plan how they can collaborate with them to create a meaningful learning experience for the students. In backward design, one begins with established goals that "typically include national, state, local or professional standards; course or program objectives; and district learner outcomes." (McTighe and Wiggins 2004, 60) In Pennsylvania, the new mathematics and reading anchors, along with the established academic standards will provide the "established goal" that Wiggins and McTighe recommend. Therefore, if the teacher is employing backward design and/or is adopting anchors, it only makes sense to collaborate with the SLMS.

- SLMSs often employ a research model, such as the Big6 or the Research Cycle, to ask the big questions that students will think about and utilize to frame their research. Wiggins and McTighe explain the importance of asking "essential questions" that "guide student inquiry and focus instruction for uncovering the important ideas of the content" (2004, 61) prior to identifying what skills and knowledge students will acquire. Since many of the research models that SLMSs institute are so similar, it only makes good sense for a teacher to collaborate with the SLMS if he is adopting the understanding by design instructional design model.

- SLMSs are the acknowledged resource experts for the school who are prepared with well-managed collections of print and electronic resources to provide all of the information that any student needs to be equipped to respond to the big questions. Interestingly enough, stage 3 of Wiggins and McTighe's design model is called WHERETO, standing for "(W) *Where* are we going? *Why*? *What* is expected? (H) How will we *hook* and *hold* student interest? (E) How will we *equip* students for expected performances? (R) How will we help students *rethink* and *revise*? (E) How will students self-*evaluate* and reflect on their learning? (T) How will we *tailor* learning

> to varied needs, interests, styles? (O) How will we *organize* and sequence the learning?" (2004, 214) Not only would these questions increase the likelihood of teachers utilizing library resources and the professional collaboration of the SLMS, this writer does not see how it is possible to accomplish WHERETO *without* the resources of the school library. Furthermore, one excellent way to hook and hold student interest is to provide them with plenty of good materials to read on their selected topic. Thus, the students stand a far better chance of increasing their levels of FVR with understanding by design and uncoverage than they ever did with covering the text and preparing for standardized tests. Finally, this writer can think of several well-publicized research models that follow a process similar to WHERETO, and these models are being promoted by SLMSs everywhere as they collaborate with their classroom teaching partners.

The most efficient way for SLMSs in Pennsylvania to have a chance of increasing their levels of collaboration with their classroom teachers is to encourage the adoption of understanding by design. It has all of the earmarks of a research process, and, therefore, is very similar to what SLMSs are doing already. Also, this adoption would occur at the same time that classroom teachers are adopting anchors that tie the curriculum together and provide the touchstones that understanding by design promotes. It may, in fact, make the classroom teachers' task of adopting anchors even easier. As a final note, students cannot possibly be immersed in seeking out the answers to the big questions and be a part of a curriculum that anchors reading in every subject area without increasing their levels of FVR. The partnering of SLMSs with the instructional design of Wiggins and McTighe will only make SLMSs more effective collaborative partners with their teachers and make better readers of their students.

Conclusion and implications for research

This writer's suppositions may make sense for many readers and anecdotal evidence is one way to collect evidence for research; nevertheless, this writer suggests that more scientific investigations be conducted in Pennsylvania SLMCs following schools' adoptions of understanding by design and adopt-an-anchor. One might investigate the following:

- Following the adoption of understanding by design, did the use of backwards design change the level of collaboration between SLMS and classroom teacher?
- Following the adoption of "adopt-an-anchor," did the level of collaboration change between SLMS and classroom teacher?
- Following the adoption of both a change in instructional design and a shift in focus toward reading and mathematics anchors, did the level of collaboration change between SLMS and classroom teacher?
- Following the adoption of a change in instructional design to backwards design, did the amount of free voluntary reading change among students?
- Following the adoption of adopt-an-anchor, did the amount of free voluntary reading change among students?

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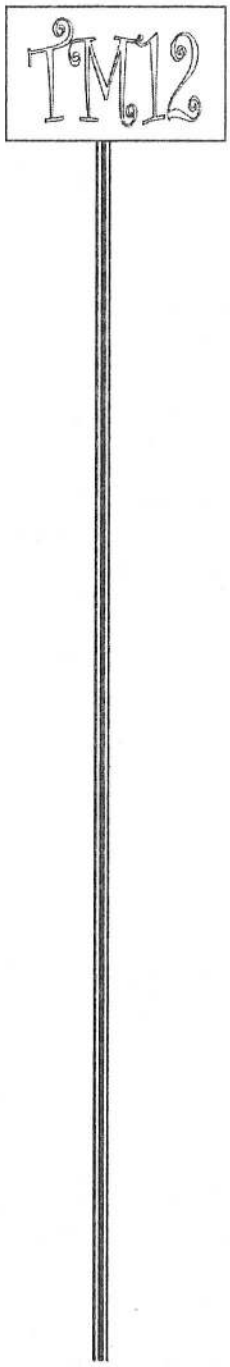

Pilot Project

Redesigning Student Assignments Through Collaboration of Academic Faculty and Library Faculty in a Community College Setting

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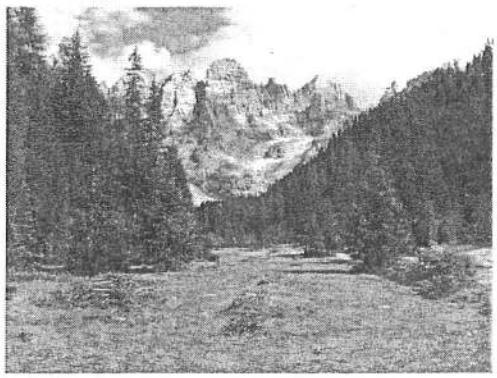

Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Pilot Project : Redesigning Student Assignments through Collaboration of Academic Faculty and Library Faculty in a Community College Setting

The information explosion has effected the traditional classroom assignment. The rapidly changing information and technology-rich environments require that today's students must 'learn how to learn' in order to become independent, life-long learners, (Loertscher, Koechlin & Zwaan, 2004). Increasingly, the skills that students require to ensure life-long learning is referred to as Information Competency or Literacy. Information literacy is defined as the set of skills that students use to locate, retrieve, analyze, and effectively use information for their needs that will help them develop into life-long learners (Association of College and Research Libraries, 2000; Teaching Information Literacy, 2005). Traditional faculty assignments encourage today's students to copy and paste information from the Internet without using evaluation techniques, synthesizing or adequately citing the information (Roth, 1999). New knowledge management roles for librarians are anchored in information literacy principles and practices encouraging collaboration between librarians and teaching faculty (Somerville, Mirijamdotter, & Collins, 2005). As knowledge managers, librarians have an understanding of the information environment that makes them a valuable asset to faculty when developing assignments. Collaboration between academic and library faculty will better utilize the vast and ever changing technology-based resources in the library for the improvement of the students' critical thinking skills. Studies also indicate that it is more effective to teach information literacy by integrating it across the curriculum rather than an extraneous class (Teaching Information Literacy, 2005). Librarians teach information literacy skills in the library and can assist in the development assignments with information literacy components. (Association of College and Research Libraries, 2003).

Library faculty at Las Positas College (LPC), Livermore, California were interested in furthering collaboration with teaching faculty in order to promote assignments that better utilized the library resources while effectively addressing information literacy issues such as plagiarism. This potential academic and library faculty collaboration became a pilot project led by Tina Inzerilla, a Masters candidate in School of Library and Information Science, San José State University and practicum student at LPC Library. The intent of the pilot project was to see if librarians could collaborate successful with faculty at an assignment level. The project used Dr. David Loertscher's "Ban Those Bird Units", which includes 15 assignment models developed for K-12. An added feature of the pilot project was to assess the transferability of the models to an academic setting. Inzerilla integrated Dr. David Loertscher's "Ban Those Bird Units" models into community college curriculum for selected LPC faculty representing varied disciplines. As documented by LPC assessment, these 15 models effectively incorporated information literacy, prevented plagiarism, and generated stimulating learning experiences. The project began as part of an assignment for Dr. Loertscher's Instructional Design class at San José State University. Inzerilla's initial work with Marilyn Marquis from English as a Second Language (ESL) Department led to further collaboration with faculty from Administration of Justice, Political Science, Biology, Zoology, Chemistry and additional ESL faculty. The results produced replicable and sustainable assignments for community college students.

The newly designed assignments are built on the fifteen models in Dr. Loertscher's "Ban Those Bird Units" book which is intended for K–12 implementation. A bird unit is a typical assignment where the student cuts and pastes information to answer questions without doing analysis or evaluation (Loertscher, Koechlin & Zwaan, 2004). This science of teaching builds on a study by Dharmadasa and Silvern that states interactive learning is more effective than traditional lectures and demonstrations (2000). In 2005 another study reported in *Journal of Biological Education* stated that traditional teaching methods were not as effective as constructivist teaching methods ("Effects of constructivist-oriented instructions", 2005). One of the goals in "Ban Those Bird Units" is to provide stimulating interactive learning experiences where students have to analyze, evaluate and synthesize which is the constructivist method. The models include:

- "Advice to Action Model" – an engaging problem or issue is assigned to a student or a group of students. Students guess what the experts recommend to resolve the problem or issue. Through

research students gather and compare experts' advice. Students then decide on the action to take to resolve the problem or issue.

- "Background to Question Model" – groups of students or individual students build background information on a topic chosen from a list provided by faculty. Students then focus on a narrower topic and formulate a project plan (i.e., research paper).

- "Compare and Contrast Model" – faculty identify the ideas or items to be compared then students select the criteria to use for comparison. Students gather and analyze information so they gain a better understanding of the ideas or items.

- "The Concept Jigsaw Puzzle Model" – faculty divides students into groups A, B, C, and D. Each group answers a thought-provoking research question when they are finished they are broken into new groups that contain members from the previous groups, ABCD, etc. The group answers a concept-forming question where the students have to combine all of their information to come up with an answer.

- "History and Mystery Model" – faculty selects a history or mystery problem. Students look at a variety of primary and secondary evidence. Students compare and contrast the sources; then new evidence is searched for and given consideration to determine a resolution.

- "The Matrix Model" – faculty divides students into groups to research and fill in a matrix/spreadsheet in order to answer questions about the subject assigned by their instructor.

- "The Problems/Possibilities Jigsaw Puzzle Model" – similar to the "Concept Jigsaw Puzzle model except each group of students looks at different aspects of an engaging problem that requires research. The new groups of students (i.e., ABCD) are challenged to find solutions to the problem.

- "The Quest Model" – student(s) decide on an engaging problem or project and divide the work into tasks. They research the problem and answer the question.

- "Read, View, and Listen Model" – groups of students read, view, or listen to several items on a topic selected by faculty. Students compare and contrast the items, and then summarize the information.

- "The Re-Create Model" – faculty select an event, issue, or time period. Students research and select a format such as a poster or drama to re-create the event, issue or time period.

- "Reinventing a Better Way Model" – faculty selects a system to study (i.e., new ways to handle school problems). The current methods are investigated, compared, contrasted, analyzed, and evaluated by groups of students to create a new system.

- "Sense-Making Model" – faculty select ideas that are misunderstood and assign students to research and analyze information. Students analyze the information and put it in a visual format to develop a new understanding of the idea.
- "Take a Position Model" – faculty identify an issue and students analyze feasible solutions. The student or a group of students take a position and prepare an argument that is presented to the class.

- "The Timeline Model" – faculty identify an event, movement, or mystery. Faculty divides students into groups to gather facts and dates. Students place the information on a timeline and then the timeline is analyzed by the students for any meanings or solutions.

- "Mix It Up!" – Faculty combine two or more of the previous models to make a new model. For example "Read, View, Listen Model" is combined with "The Concept Jigsaw Puzzle Model"

Under the supervision of Dr. Loertscher, Inzerilla collaborated with Marilyn Marquis, Coordinator of the ESL Program, for two beginning ESL writing classes and one beginning reading class. Students were reading a book about the Lewis and Clark Expedition and would respond to one of several questions about the expedition for the final exam. Marquis was interested in working with Inzerilla to create assignments that involved students in "researching" aspects of the expedition using their textbook. Inzerilla and Marquis created four assignments.

In the first assignment using the "Concept Jigsaw Puzzle Model," the class was separated into three groups. Each group focused on a unique role of Jefferson, Lewis, or Clark and identified specific examples and situations from the text to support the individual's role. New groups were formed with members from each of the original research groups. Students in the new groups shared their research knowledge with each other and identified how Jefferson, Lewis and Clark contributed to the success of the expedition.

In the second assignment, using a "Matrix Model," students again joined a Jefferson, Lewis or Clark group to identify roles, qualities, unique skills, and important accomplishments of each historical individual. After completing their research, students were divided into different groups. The students discussed the contributions and importance of each person to the success of the expedition. After a class discussion analyzing the importance of Jefferson, Lewis, and Clark, students wrote about why each was "the right person for the job."

In the third assignment, using the "Timeline Model" in a reading class, students separated into Jefferson, Lewis, or Clark groups. Each group created a timeline of actions and events for their character. The class then discussed why the time order of events contributed to the success of the expedition. Students wrote a paragraph telling someone in 1803 what to expect on the expedition.

In the fourth assignment using the "Timeline Model," students in a writing class were asked to describe the inside of a tent, a Native American village from one of the Lewis and Clark camps or forts. This assignment required creativity and imagination on the part of students since the textbook did not have specific information or drawings. They had to review the sequence of travel and create one verbal description using space order. Marquis used these four new assignments in her classes as preparation for the students' final exam.

The final exams in LPC ESL writing courses are holistically scored at a group grading session at the end of the semester. The ESL program has six levels, four of which were reading about the Lewis and Clark Expedition. The instructors had developed student learning outcomes and grading rubrics for the final exams. The criteria for grading focused on organization, development, and language use. The students were aware of the criteria and knew that their finals would be graded by a group of instructors. It was immediately clear that students in Marquis' writing classes had internalized the reading material in unexpected ways. They had better control of content and development, though not necessarily of language control. The students who had taken both reading and writing scored higher than those who took only the writing class and the students who completed the new assignments did much better and showed more comprehension of the material then their counterparts using the traditional assignments. The discussion of student papers at the grading session led to a request for a program wide workshop with Inzerilla.

At the final exam, Marquis asked students to complete a "One-Minute Final Response." In the question, "Did you feel well prepared to take the Final exam? What activities helped you the most?" 42% of the responses mentioned the class activities related to the Lewis and Clark Expedition.

Marquis enjoyed working with the models and her students responded well to the assignments by asking clearer questions, participating with enthusiasm, paying better attention, and not wanting to leave when the class was over. As a result of the student responses and the faculty interest at the holistic scoring session, Marquis requested staff development funds and arranged a workshop on the 15 "Ban Those Bird Unit" models for the ESL faculty.

At the workshop, Inzerilla used the "Read, View, Listen Model" and the "Concept Jigsaw Puzzle Model." The "Read, View Listen Model" had faculty review five models each. The "Concept Jigsaw Puzzle Model" had faculty regroup to instruct each other on the variety of models and the types of assignments each could produce. In the next part of the workshop, instructors got into groups according to level and course to create new assignments using the models. The workshop also demonstrated how using the models to create interactive and interesting research assignments could incorporate information literacy and meet student learning outcomes. Student Learning Outcomes (SLO's) is a new criteria being added to the LPC curriculum documentation in order to meet the Western Association of Schools and Colleges' accreditation standards (Accreditation, 2002). Faculty were pleased that assignment level SLO's could be created with the models. The faculty also expressed positive comments indicating that they were going to incorporate the models into their curriculum assignments. An informal survey indicated that the "Matrix Model" and "Concept Jigsaw Puzzle Model" were the most useful for ESL faculty in creating their new assignments.

Two of the ESL faculty, Ruth Moore and Teri Suzuki, teamed up with Inzerilla to create an assignment using "The Matrix Model." Inzerilla then provided the library instruction to the classes, which included a follow-up, hands-on project designed with "The Matrix Model." An informal questioning of students while in the library indicated that they enjoyed the hands-on assignment and the library instruction. Moore and Suzuki were enthusiastic about the collaboration because they observed that students were more actively involved in their assignment and had better comprehension skills concerning the assignment.

Faculty from the other disciplines that participated in the project with Inzerilla were impressed with the models' ability to incorporate information literacy into the assignments, and pleased that the models easily formed student learning outcomes. Mark Tarte, Administration of Justice, commented that the assignments were creative and he would be incorporating them into the Fall 2005 classes. Tarte also expressed interest in collaborating with Inzerilla to create assignments for a new class that he is adding to the LPC curriculum. In total, Inzerilla created 26 assignments using the models. The breakdown of the disciplines and the models used are:

- Administration of Justice: "Read, View, Listen Model," "Advice to Action Model," "Compare and Contrast Model," "Problems/Possibilities Jigsaw Puzzle Model," "History and Mystery Model," "Take a Position Model," "Re-Create Model," "Reinvent Model"

- Biology: "Concept Jigsaw Puzzle Model," "Matrix Model," "Re-Create Model"
- Chemistry: "Quest Model"

- ESL: "Concept Jigsaw Puzzle Model," "Matrix Model," "Timeline Model," "Re-Create Model," "Mix It Up"

- Political Science: "Background to a Question Model," "Sense Making Model"

- Zoology: "Matrix Model," "Compare and Contrast Model"
  Successful collaboration with the faculty led to a workshop for the Las Positas College librarians.

The workshop included learning the models, brainstorming ideas based on past interactions with students concerning their problems with assignments and a hands-on practice exercise creating an assignment

using one of the models. LPC librarians readily recognized the usefulness of the models in helping faculty adapt present assignments to better incorporate information literacy skills. The librarians discussed the benefits of collaboration with faculty on the assignment level as including:

- Collection development - to allow for purchase of information resources in a timely fashion to support students research.
- Library instruction – allows the librarians to tailor the library instruction more specifically to the needs of the students based on the assignments
- Curriculum Process – presents the library faculty as part of the teaching process
- Feedback – librarians interact with students, particularly students having trouble with assignments and are better prepared to provide feedback to instructors
- Information Competency (IC) – the college is just developing a strategy to meet IC criteria. The workshop models presented useful formats and examples for integrating IC into the curriculum.

Based on the success of the pilot project, Las Positas College Library will present the opportunity to faculty to adapt their current assignments using the models via one-on-one appointments with Inzerilla in the library. Marketing of this library service will be done at the monthly discipline division meetings. The library will also sponsor Inzerilla's workshop as a flex day activity in Spring 2006.

The pilot project demonstrated that academic and library faculty can collaborate on the assignment level to create stimulating interactive assignments that:

- Incorporate information competency skills
- Take advantage of the library's varied information resources
- Provide faculty with student learning outcome criteria on the assignment level
- Reinforce library instruction given to individual classes
- Engage student interest and increase class participation
- Produce improved student work

Success of the project also signifies that there is a role for librarians as knowledge managers. With their intimate understanding of retrieving and evaluating information resources, technology, and information literacy as well as their position of observing students' research, librarians are an asset to the teaching team. Collaboration can provide beneficial results for both academic and library faculty, helping to address each area's issues and concerns on an assignment level, and truly "ban those bird units".

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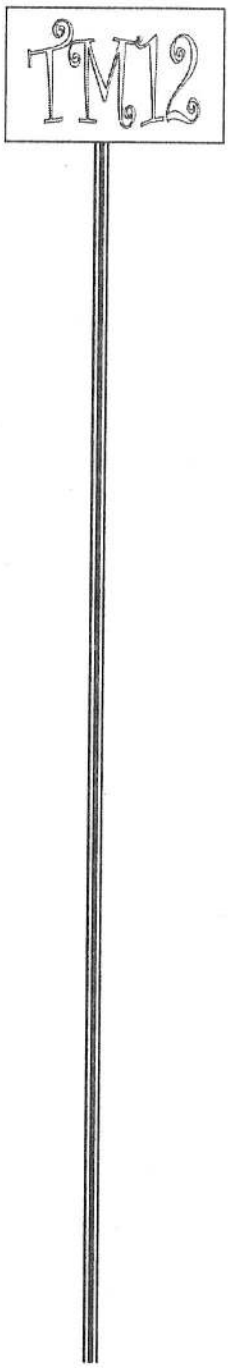

Beyond the Bird Unit

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Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Beyond the Bird Unit

Lance and Loertscher (2001) warn that it is possible to use high quality information resources and yet still create ineffective learning experiences for K12 students. To illustrate, they discuss the "Bird Unit," the type of research activity where students search for information in order to fill in worksheets, which they transform into essays and presentations. By itself, this type of exercise does not go far in promoting information literacy. Information literacy standards, as defined by the American Association of School Librarians (AASL), purport to promote the skills of the life-long learner as related to information use, self-directed learning, and social responsibility (1998). This paper contains a brief overview of constructivist teaching strategies followed by a description of this collaborative inquiry, where teachers and teacher-librarians pooled their experience and knowledge. This effort resulted in a number of strategies for using information to enrich learning. After presenting the strategies, this paper concludes by suggesting a process that for using constructivist methods to enrich any lesson plan. The process integrates information literacy skills with three types of constructivist lessons: problem-based, inquiry-based and project-based.

Constructivist Strategies

A traditional view of learning regards knowledge as being outside of the learner. The learner acquires knowledge through the senses. The constructivist view assumes knowledge cannot exist outside the bodies of cognizing beings and that it is created by dynamic interaction with the learning environment (Tobin & Dawsin, 1989). Traditional pedagogy values "replicability, reliability, communications, and control", while constructivist pedagogy values "collaboration, personal autonomy, generativity, reflectivity, active engagement, personal relevance, and pluralism (Lebow, 1992, p. 5). Because constructivist pedagogical strategies are learner-centered, they fit well with information literacy skills that are aimed at individual, life-long learning.

Problem-Based Learning

Problem-based learning (PBL) was introduced in medical schools in the 1960s and is currently used in many disciplines. The components of PBL are;: problem formulating, abstracting, applying knowledge, self-directed learning, and reflecting (Koschmann, et al., 1996). These components fit well with the AASL information literacy standards. PBL starts with a real world problem that might not have a clear solution. The problems are always messy. For example, problems involving case studies work well for PBL. These problems need to be analyzed and reanalyzed by students. The traditional pedagogical approach of carefully sequencing instruction is replaced with more authentic approaches to problem solving and the creation of an environment that has the necessary resources for reaching a conclusion to the problem, if not a solution. Students work in a self-directed manner, individually and in groups. They follow their hunches, seeking out information to support or invalidate the leads they generate. Graphic organizers are used by students to analyze the problem and to keep track of knowledge that is acquired during the process. Students determine when the process is complete, either by reaching a solution or a consensus that they have moved as far as they can toward a solution. Teachers and librarians act as mentors, asking questions that lead students toward deeper reflection; or they provide hints that direct students toward new information sources.

Problem-Based Learning is bounded by the availability of resources and the ability of the mentors to keep students in their zone of proximal development (ZPD), the area between what a student can do alone and can be done with assistance (Vygotsky, 1978). Mentors assess students' knowledge and skills related to information literacy. They model and promote these skills. At the same time, they must know when to step back and let the student struggle through the problem-solving process (Koschmann, et al., 1996). The key to finding suitable problem-based lessons is to find the freedom that comes from letting go of traditional instructional sequences and

looking for problems designed for students one or two grade levels ahead and selecting ones that students might manage given a rich information environment, scaffolding, and mentoring.

In problem-based learning, the information literacy skills related to information access, evaluation and use are practiced extensively. To illustrate the process, reading teacher, Paula Fagan, created a problem-based lesson that has fourth grade students find and organize information in order to solve the problem, "What the type of spider is Charlotte?" The lesson plan is presented in Figure 1

Inquiry-Based Learning

"The library is the inquiry center in the information age school" (Kulthau, 2001). Inquiry-based strategies take advantage of information-rich environments by promoting a student's natural inquisitiveness. The strategies encourage children to make observations and to figure things out. Inquiry-based learning refers to a continuum. On one end is free-ranging inquiry; on the other is highly structured, directed inquiry (National Research Council, 2000). In free inquiry, students generate their own lessons from exploring phenomenon embedded in the world around them. Students are encouraged to explore according to their personal interests. At the farthest point at this end of the continuum, students are not corrected when they make errors, as this may discourage inquiry. Instead, they are encouraged by teachers to question their assumptions as they build their knowledge. At the other end of it the spectrum, inquiry is directed toward predefined outcomes. Teachers choose the topics and provide children with hands-on experiences meant to stimulate their curiosity. In between the extremes are many examples where teachers and librarians create an environment that sparks students' interests. They help students draw the connections between their interests and the learning standards being pursued. In inquiry-based learning, students are encouraged to ask questions, but they are also required to find answers to their questions. The inquiry learning process closely resembles the information seeking process. The affective states related to learning are viewed as motivators. "An Inquiry approach calls for guiding students in thinking and reflecting in the process of information seeking and use that leads to understanding, learning and to transferable information literacy" (Kulthau, 2001).

Inquiry in the classroom can be bounded by provincial and state learning standards. Left unbounded, it tends to follow youth culture and sports interests, particularly in teens (Nielsen, 2005). However, as students are given the opportunity to develop their historical and cultural imaginations, this problem might be mitigated. The school library is the place for this kind of development to occur.

In inquiry-based learning, the information literacy skills related to self-directed learning are practiced extensively. Figure 2 presents a lesson created by teacher-librarian, Connie King. Connie creates an environment that encourages high school students to explore a number of resources on the United States Civil Rights movement. In the process, students are exposed to multiple aspects of this period in history, motivating to pursue their own questions.

Project-Based Learning

Project-based learning is the third constructivist strategy explored in this investigation. While problem-based and inquiry-based learning strategies are inherently social, project based learning is social at its core. Project-based learning has many definitions. In this discussion, project-based learning refers to the times when students work together on a project where the result is the assembling of individual student contributions. Often the whole is larger than the sum of the parts, as tends to be true of collections. Projects can vary in scale. They can be run in a single classroom, a school, a city, a country, or internationally. The Internet is great for project-based learning because it enables global cooperation. Agencies like NASA offer projects continually.

Many museums now offer projects. There are scientific studies like the one conducted by River Web, where students around the world test water quality. At the school level, themes can be the focal point of projects. For example a middle school in Portland, that has ecology as its core emphasis, has an Earth Day celebration every year. Students work on creating products for performance and display at that celebration (Snow, 2005).

Project-based learning is bounded by the need for articulation work (Schmidt & Bannon, 1992). Articulation work relates to planning and planning to plan. In project-based learning, students discuss details and arrangement outside of the content area objectives. For younger children, this might be as simple as dividing responsibilities and deciding how they know when a project is finished. Older students might discuss how responsibility will be distributed, how timelines will be planned and implemented, and how the progress of the project will be assessed and managed. At all levels, students can learn project oversight through their articulation work as they learn how to work in cooperation with each other.

In project-based learning, the information literacy skills related to social responsibility are practiced extensively. In the project-based lesson presented in Figure 3, teacher-librarian Karron Ingram worked with a kindergarten class to create an alphabet book. Students looked at examples of alphabet books in the library, and then each took a letter and selected a theme for decorating a page depicting the letter. Together the class created a new alphabet book of their very own.

Combining Strategies

Problem-based, inquiry-based, and project-based strategies are not always distinct. Moreover, they can be interwoven. Inquiry-based learning can be used to promote social responsibility. Problem-based learned can be self-directed; and project-based learning can involve access, evaluation, and use of information. At the core of these strategies are activities designed to motivate students. They involve real-world issues that are of interest to society, the immediate community, friends, family, and the individual. These constructivist strategies offer students choices relating to problem-solving methods and taking ownership of their work. They create opportunities for social interaction and they let students decide how the information is organized and presented. All these methods take strategic planning on the part of teachers and librarians. Short term and long term goals are established and communicated to students. In establishing the learning environment, types and levels of scaffolding are carefully selected to support learning (Loertscher, Koechlin & Zwaan, 2004). These constructivist methods are new to many students. Reticent students need to be encouraged to participate. All students need opportunities to succeed.

In this investigation, discussions were related to curriculum standards, collaboration between teachers and librarians, and constructivist pedagogical strategies. The knowledge generated from the discussions is presented here. The conclusion describes a process for using information to enrich any lesson plan. Teacher-librarian, Linda Pierce presents a way to combine strategies by enhancing a fourth grade lesson taught to every student, the lesson on Famous Missourians. The problem students faced was to select and then defend their candidate for Famous Missourian. Creating an Inquiry environment, Connie brought in guest speakers and introduced students to a number of perspective candidates. The student's project was to create and populate a timeline with the candidates they select. This lesson plan is presented in Figure 4.

The Collaborative Inquiry

> Collaborative inquiry is a systematic process ideally suited for facilitating learning-within-relationship. Small groups of learners come together as peers to pursue a question of mutual interest. Using systematic procedures for learning

> from their personal experience, participants generate new knowledge from repeated episodes of reflection and action. They share equal power and responsibility for making decisions, practice critical subjectivity and intersubjectivity in mutual pursuit of new meaning, and follow explicit validity procedures (Kasl & Yorks, 2002).

This investigation took place through a course entitled, Using Online Resources. This was a semester long, seminar style, distance education, graduate level course in Library and Information Science at Central Missouri State University. It was taught by the Jenny Robins in Fall, 2004, who along with seven students, conducted a collaborative inquiry designed to uncover processes for using information to enrich any lesson plan in primary and secondary education. The seven students in the course had a variety of teaching experience. Three were experienced in adult education at the university and corporate level. One was in her fourth year as a library aid. One was an elementary school teacher with twenty-three years of experience. The other two students had a combined total of seventeen years of experience as school librarians. Each student introduced five lesson plans, one modeled after a traditional approach, three modeled after the constructivist strategies defined here, and a fifth lesson plan combining strategies.

Each type of lesson plan was discussed online. Before the completion of the fifth lesson, the instructor and the students revisited the twenty-eight plans they had created and produced a written analysis focusing on their strengths and the processes revealed in the plans. The instructor used these discussions, lesson plans, and students' written analyses as data. They were analyzed and coded according to the grounded theory method (Strauss & Corbin, 1998). Collaborative inquiry is recognized as an instruction strategy for adult education, but the new knowledge produced during inquiries often merits distribution. Such is the intent of this report on the findings of our investigation.

Using Information to Enrich Lessons

What is wrong with Bird Units? Sometimes nothing. There are times when this type of instruction might be exactly right, but the library offers opportunities for richer learning experiences. Bird units are highly scaffolded. A teacher or librarian has done the work that students might have found interesting and beneficial. Students are not adequately challenged or engaged. On the other hand, a lack of appropriate scaffolding can be frustrating. Work that is too hard can exasperate students. Finding the balance is difficult. Loertscher, Koechlin and Zwaan's new book, "Ban the Bird Unit" (2004) presents models for appropriate scaffolding.

Another problem with bird units is that they rely too much on imposed questions and not enough on student generated questions. A process that enriches learning through the use of the school library begins with inquiry (Kuhlthau, 2001). The process could be looked at through three facets. The first and most important is the perspective of curriculum standards. These standards reflect the wishes of society for student learning, and since the public funds schools, it is fitting to consider learning standards as paramount (Dewey, 1938). Another lens for viewing the process of using information to enrich lessons is to focus on the collaboration between teachers and school librarians, which ideally drives all library activity. A third focus is the perspective of the learner, which is addressed by constructivist teaching strategies. Issues that fall into this category include: motivation, social learning, problem solving, establishing credibility, and means for assessment.

Learning Standards

The curriculum standards, not to be confused with the standardized tests, open up the cannon of knowledge that society has a deemed to be important enough to pass on to the next generation. Most provinces and states make their curriculum available online, but there is also a compendium of standards available through Mid-continent Research for Education and Learning (MCREL). MCREL has taken the standards from several countries and has put them into a single data-base that connects them all. Along with this, there is a collection of lesson plans to accompany many

of the standards (MCREL, 2004). The MCREL compendium is not an attempt to build central standards; rather it is a combining of all the standards currently in use. Other sites that link standards and lesson plans include the E-Themes (2005) site, the Ontario-based GRASSROOTS project, and the Gateway to Educational Materials (GEM, 2005).

Curriculum standards can serve as boundary objects, objects that the serve as a focal point for discussion between different members of a community, such as teachers, librarians, and students (Star & Griesemer, 1989). Standards can be used as planning tools, providing agreed-upon, lesson objectives. They can be provide short cuts for finding resources in the library and on the web, since mapping is being done between standards and resources in online catalogs and on the Internet. Standards present the essential questions and big ideas that drive learning. This provides cognitive room to think about and discuss how different types of lessons can be used to meet the objectives. At this point, the time available for the lesson will be a major factor.

In addition to curriculum standards, information literacy standards can be considered. Information literacy standards often map closely with provincial and state performance standards. They promote skills that are essential to successful learning. Activities that are aimed at achieving curriculum standards are enhanced when activities directed at information literacy standards are added to a lesson plan.

Collaborating between Teachers and Teacher-Librarians

Teachers are the leaders in collaborations with the teacher-librarians. This is because it is the teacher's curriculum goals that drive the learning activity. Information literacy goals are folded into curriculum goals. Goals from content standards can be used to create learning objectives and to discuss the essential questions students are to answer. Teacher-librarians locate and discuss opportunities to exercise the information literacy standards related to finding, using and evaluating information; self-directed learning; and occasions for students to exercise social responsibility.

The teacher-librarian's first step is to consider available information sources that support the lesson. Also, consider lesson plans being developed by other teachers. Is there a way to combine lessons into a larger project? Next, plan the information seeking process, deciding, in collaboration with the teacher, the scaffolding that will be needed to assist individual students with the search process. When possible, differentiate the scaffolding for the class in order to meet the diverse needs of the learners. In this part of the collaboration, the teacher's knowledge of individual students will drive planning. Constructivist strategies can be introduced by discussing how the learning sequence could be altered and ways to leave time for students to explore and generate their own questions. Are there projects in the community or available through the Internet that might be incorporated into the lesson? Discuss assessment from the outset of planning. Is there a way that the school librarian and the teacher can assess student work together, thereby splitting the load?

Finally, since everyone in the school community is pressed for time, asynchronous collaboration might help. Instant Messenger services, e-mail, and discussion boards can all be used for collaboration. These provide ways to write brief notes during the planning and during the activities. They create a written record of the collaboration, which can be useful if the teacher and teacher-librarian wish to showcase their work or provide professional development to others. They also serve as an historical record that can be referred to during future collaborations.

The Perspective of the Learner

Problem-based, inquiry-based, and project-based strategies all emphasize that knowledge is constructed by the learner. For this to happen, students must take responsibility for their learning. There is a corollary that proposed that, if students have more control over their learning, they are

more likely to be engaged. In this investigation, there was universal consensus that constructivist methods motivate students to take responsibility for their learning. In an era where teachers are working too hard and students not working hard enough, constructivist methods are gaining in appeal.

Motivation

Learning is work and motivating children to work can be a challenge. With younger students, it is easier to ignite curiosity and encourage the spirit of inquiry. Dewey noted that the best education occurs when the child's curiosity interacts with organized curriculum (Dewey, 1915/1956). The library is an excellent environment to spark a child's curiosity and love of learning, as evidenced by elementary school childrens' interest in nonfiction books. Book talks are effective in sparking children's interest and work as well with nonfiction as with fiction books. Add artifacts and visits from experts and elementary age students find intrinsic motivation to apply themselves to learning.

Motivating teenagers to learn can be more difficult. One place that guidance is needed is in both working with and countering the cultural imagination that motivates learning in secondary students. Knowing popular culture is a form of social capital, giving students prestige among their peers. Using the Internet, they gravitate toward sites about sports heroes, cars, beauty and fashion, or rock stars. They demonstrate a well-formed cultural imagination, but they lack a cross-cultural imagination, which can only be developed through exposure to other cultures. They also often lack a historical imagination.

The library has resources that can be used to explore cultures and history. Every topic in every subject has a history and all face current issues, many of which are related to multi-cultural impacts. Adding brief historical and cultural perspectives to learning topics help students become more engaged and can lead to student-generated questions. Those questions can be transformed into search strategies, and the library, a rich source for answers.

Social learning

Dewey recognized self-expression as an impulse that could be used as a resource in the classroom (1915/1956). Students have a desire to "... teach about [themselves], as well as to learn and to express [their] ideas, feelings, and values..." (Bruce, 2000). Because of this, students are motivated to learn in social environments (Vygotsky, 1978). This social learning is a pedagogical style inherent in problem-based, inquiry-based, and project-based learning. In social learning, students learn both content and process from each other. Today's technology supports social learning through asynchronous communication. Through Instant Messenger, email and discussion boards, every student can participate and is encouraged to add thoughts and ideas.

Students not only learn about subject content from each other, they can see how other students work together to share and build knowledge. They also learn how credibility is established among peers, through verbally evaluating activities and products. Social learning can activate higher order thinking as students feel accountable to each other and justify acts and opinions. It also allows students with different intelligences, life experiences, cultures and values to share their perspectives. An ultimate goal of social learning in this context is to demonstrate to students the value of knowledge as social capital in areas other than popular culture and sports.

Problem solving

The three constructivist strategies explored in this investigation all incorporate a high level of problem solving skills. While these skills are not identified as information literacy skills, many problems require information literacy as part of the problem-solving process. In a similar way, problem-solving skills are necessary for developing information literacy skills. Connections between the two include the ability to identify and compare characteristics and properties, the

ability to distinguish the parts and the whole of environments and systems, as well as to identify connections between parts. Problem solving involves the ability to recognize examples of types, in order to transfer skills developed solving one type of problem to other, similar problems. In problem solving, students learn to collect, filter, and examine information, which are all skills that map to information literacy skills in accessing, using, and evaluating information.

Problem solving skills are needed in the inquiry cycle that characterizes self-directed learning. Students analyze, categorize, organize, and classify information, making records at appropriate steps. The role of record keeping in information literacy is not addressed directly in the standards, but is implicit in learning to use information efficiently. In the traditional bird unit, students record knowledge on worksheets and express knowledge in linear, written form. Constructivist strategies lend themselves to situations where students create their own graphic organizers, a useful skill in life-long learner. Forms of organizers such as investigation guides, checklists, KWL charts (Know, Want to Learn, Learn), timelines, charts, and graphs can be used to record information. Mind maps, and concept maps can organize information once it is collected. As end products, students can create bulletin boards, posters, murals, games, and job aids in addition to more traditional products. Advanced students can create the graphic organizers to be used by others thus demonstrating how such skills are arrived at and practiced. Teachers and teacher-librarians can also model the process and invite students to participate.

Establishing credibility

Establishing credibility is a crucial component of constructivist learning. It is the Twenty-First Century version of critical thinking. It connects to information literacy at two levels. The first relates to the skills necessary to evaluate information sources. The second is the ability to establish one's own credibility. Both of these skills can be taught and developed in the school library. For example, bibliographic instruction in the use of citations serves two purposes. It teaches the correct form for using and creating citations, and can also include instruction on how citations are used to establish credibility. In a similar way, in teaching the skill of website evaluation, the authority of the site's creator is a factor. Instruction can also include how a reputation is established and how it is ruined.

Rationality is the basis of Western civilization. Rationality is a system for presenting evidence in a logical, empirical way. In order to promote democracy and social responsibility, information literacy instruction includes teaching students the difference between off-the-cuff opinions and observations, and those formed on the basis of evidence. Younger students learn this when they learn to distinguish between fiction and nonfiction books. Older students learn this in dialog if given an opportunity to discuss and critique each other's ideas. In planning instruction with teachers, teacher-librarians can take advantage of opportunities to provide activities that reinforce skills related to establishing credibility.

Assessment

The purpose of assessment is to establish that learning has taken place; the student has met the goals and objectives of the curriculum standard and, ideally, has had occasion to practice information literacy skills. Traditionally, assessment is done through means such as tests and student products such as essays and presentations, which are frequently the culminating points in a learning activity. When the assessment tool leads to increased learning, it is referred to as an authentic assessment. Authentic assessment can include a variety of student products including; exhibitions, timelines, performances, presentations, solution documents, graphic organizers, and written work such as essays and reflection papers. Authentic assessment can be formative, resulting in the iterative creation of products. Authentic assessments are usually scored through the use of rubrics and through feedback that is tied to a rubric.

Student self-assessment is another possibility. Students can create their own scoring rubrics or use rubrics developed by the teacher or teacher-librarian. Students might be invited to establish their own learning goals, evaluating and scoring their progress. Self-assessment saves time for the teacher and librarian, as the students are doing more of the work. There is also a learning gain for students as they take ownership and control of their learning process. In order to do this accurately, students need instruction and supervision. The school library is an ideal place for this type of activity as the skills inherent in self-assessment line up with information literacy skills. For example, there is similarity between the rational needed to establishing the credibility of information sources and the rational needed to establish that a student has learned. This is related to the collection and use of information to produce evidence.

Assessing constructivist learning is problematic. These strategies do not lend themselves to testing. For example, problem-based learning frequently deals with problems that don't have a clear solution, the goal is mastery of a process. In inquiry-based learning, individual students might pursue different aspects of a topic. In project-based learning, students can work on different areas a project. How are assessments individualized and how much assessment data is enough? A solution to the former question is to use a variety of assessment instruments, including self-assessment data, completed products, answered questions, and hypotheses proved. By focusing on the quality through various types of instruments rather focusing on specific criteria, it is possible to accommodate differences related to content learned. The answer to the latter question is simplistic; when everyone is done you have enough data. Constructivist learning in ongoing, problems lead to problems and questions lead to more questions. The problem, inquiry, or project is complete when time runs out.

A Process for Using Information to Enrich Learning

The process of using information to enrich learning starts with the collaboration between the teacher and a librarian. The teacher takes the lead by deciding which curriculum standards are to be met with through the activity. These standards are the focal point of the collaboration. After the big questions are identified, problem-based, inquiry-based, and project-based constructivist strategies are considered. These approaches not only promote information literacy skills, they support learning. The decision on which strategy to use is based on the resources available. The chief constraint is the time available for conducting the lesson.

In deciding on a strategy, it is necessary to consider the learning environment available and the nature of the lesson. If the lesson requires students to develop skills in information access, use, and evaluation, problem-based learning is indicated. If there is room for students to question and explore a topic, inquiry-based learning is indicated. If individual products can be combined with those of other students in the classroom, school, community, or online, project-based learning is appropriate.

Regardless of the strategy selected, motivation is a factor. Using problem-based learning, scaffolding and mentoring is a key concern. With inquire-based learning, a stimulating environment is important. In project-based learning, it is important for students to create a collective product that is recognizably greater than their individual contributions. In each of these strategies, activities are needed that will stimulate motivation. Giving students more responsibility for and control of their learning leads to increased motivation. Social learning is also motivating. Students enjoy teaching each other and they can model their learning processes while they increase their knowledge. Other factors in the environment relate to the skills and tools needed for problem solving. Problem solving skills blend well with the skills needed for information literacy. Scaffolding in the form of graphic organizers and/or mentors can be provided by teachers, teacher-librarians or students.

Establishing credibility is interwoven throughout the learning task. It relates to finding reliable sources, engaging in rational discussion, and establishing personal credibility as a holder of

knowledge. In the latter case, consider ways to involve students in self-assessment. They can assess their learning process, the extent of learning, and their progress. The assessment can be part of the learning process. Using multiple assessment instruments makes it possible to measure student learning even when it is differentiated.

Finally, after creating and implementing a lesson plan that goes beyond the bird unit, celebrate! Let the school community know what has occurred. Have students exhibit the products of their learning, so they can see how the community values their work. Celebrating information literacy is the best way to promote it.

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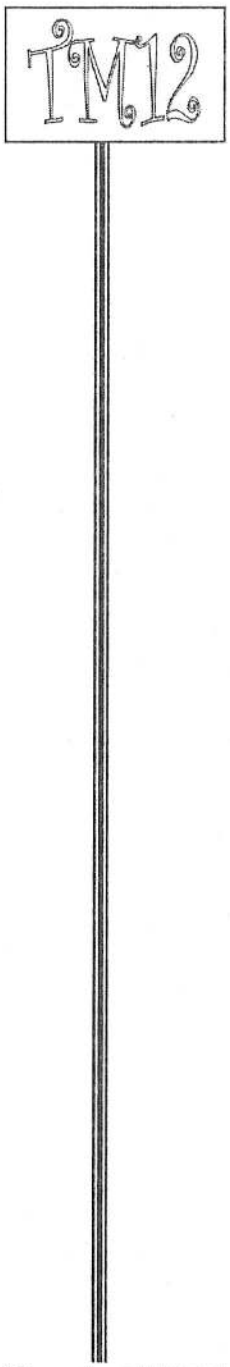
Acknowledgements

I would like to thank the members of the collaborative inquiry team: David Cruz, Elizabeth Holmes, and Yenlin Jia. Their knowledge and ideas helped form the substance of this paper. Special thanks to team members Paula Fagan, Karron Ingram, Connie King, and Linda Pierce for the wonderful examples I have included here.



Toward a Model of Teacher and Librarian Collaboration (TLC)

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Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Toward a Model of Collaboration for Librarians and Educators

The growing population of diverse students challenges the current educational structure. Teachers who were previously able to teach autonomously are unable to address the needs of students alone.

The Challenge

Improving learning in a rapidly changing global and diverse society is the challenge of the twenty-first century. The growing number of students from diverse linguistic and cultural backgrounds, with limited resources to serve their needs, poses a complex educational challenge that must be addressed by innovative instructional practices (Montiel-Overall, in press). Collaboration is one such practice that has become an educational priority. In professional literature for educators (Sergiovanni, 2005; Roberts, 2004; Rubin, 2002; Friend & Cook, 2000; Bruffee, 1999; Pounder, 1998; Fishbaugh, 1997; Johnston, 1997; Pugach & Johnson, 1995; Senator, 1995) and librarians[1] (American Association for School Librarians and Association for Educational Communications and Technology, 1988, 1998; Callison, 1997, 1999, 2003; Haycock, 2003, 1999, 1998; Kuhlthau, 1993, 2005; Loertscher, 1982, 1988, 2000), collaboration is suggested as a new way of teaching that will profoundly impact learning. To maximize the potential of collaboration, however, we need to know what collaboration is and how it is best carried out in educational settings for the improvement of instruction. In short, we need a better understanding of how teachers and librarians work together in order to move forward our understanding of successful collaboration and how it positively impacts student academic achievement. The challenge for educators and librarians is to learn how to collaborate so we can teach student to collaborate to learn (Brna, 1998).

Collaboration is grounded in belief that teaching and learning are social engagements and are best conducted in environments where educator and learner are able to interact with one another as a community of learners (Dewey, 1902, 1963; Bruner, 1968; Vygotsky, 1978). This epistemological perspective of teaching and learning which values community underlies much of the current focus on collaboration in education. A social constructivist worldview (Dewey, 1903, 1963; Bruner, 1968; Vygotsky, 1962, 1978) sets the stage for examining collaboration and provides a framework for developing models and a theory of collaboration for teachers and librarians.

In previous works by the author (Montiel-Overall, 2005a; 2005b), a broad survey of literature on collaboration in education, library and information science (LIS), and management (Austin 1998, 2000a; 2000b; Senge, 1990, 1996; Senge, et al., 1994; Kanter, 1994; Wood & Gray, 1991) and technology (Roberts, 2004; Olson & Olson, 2000; Roschelle & Teasley, 1995) indicates that despite differences in models of collaboration, certain similarities exist. Among these, are cooperation, intellectual engagement, creative problem-solving, innovation, and integration. From these similarities, models for building a theory of teacher and librarian (TLC) evolve. Four models of teacher and librarian collaboration (TLC) proposed by Montiel-Overall (2005a) are Model A: Coordination, Model B: Cooperation, Model C: Integrated Instruction, and Model D: Integrated Curriculum. The work of Loertscher (1982, 1988, 2000) and others interested in collaboration (John-Steiner et al., 1998; Clark et al., 1996; Austin, 2000b) influenced the development of the models. The models describe sets of relationships between collaborating partners that change depending on the educational goals of each collaborative endeavor (Brna, 1998, para. 5). This paper further develops our understanding of these sets of relationships or

[1] Throughout this paper the term librarian will be used to identify professionals working in a school library. Other terms used are school library media specialist, media specialist, library specialist and librarian/media specialist. More recently, the preferred term is teacher-librarian, which was not used to avoid confusion in the paper but would most reflect the librarian's role in Models C and D.

interactions by discussing essential characteristics of collaboration such as trust, respect, reciprocity, collegiality, and propensity to share. The presence of these characteristics as well as adequate resources and supportive environments are shown to be enablers of successful collaboration. Further research in these areas will move us closer toward a theory of teacher and librarian collaboration (TLC).

The first section describes the models and discusses the role of teacher and librarian within the four models of collaboration (Models A, B, C, and D). Although the models are conceptual, they reflect discussions with practitioners engaged in collaboration inasmuch as theoretical models are best developed with the voice of those who are involved in practice. Section B elaborates on two models that represent "high level" teacher and librarian collaborative efforts within the classroom and schoolwide (Models C and D). In this section, enabling conditions such as environment, resources, and attributes of collaboration are examined, and the relationship between these factors and the impact collaboration could have on student academic achievement is discussed. Section C discusses implications of the models and changes in school practices necessary to accommodate collaboration. This paper argues that collaboration is a complex endeavor which must be fully understood if positive student academic achievement is the desired outcome of the effort. A better understanding of the process involved in collaboration, and more precise language to describe types of joint efforts will help us initiate more effective collaboration in educational settings.

Section A: Understanding the Models

Professional collaboration is a ubiquitous term that over time has acquired many and often nebulous meanings and properties in the school effectiveness and school improvement literature.
~Leonard & Leonard, 2001, p. 5~

Changing Roles

The roles of teachers and librarians are in transition. Educational reforms have attempted to shift autonomous teaching toward a team/partnership approach in order to better address the complexities of teaching in an information age. Content areas can no longer be taught using texts alone. The explosion of information in electronic sources available for instruction requires informed professionals to find and evaluate resources for teaching. Logical partners in this endeavor are librarians whose roles have also been in transition. Librarians have become highly skilled information specialists whose traditional expertise in collection development and reference instruction has expanded to include working with students to develop multiple literacies (i.e. media literacy, information literacy, computer literacy) through resource-based instruction.[2] The new role for librarians includes being a knowledgeable teacher as reflected in the current use of the term teacher-librarian. By being equally involved in student learning, librarians and teachers have become natural partners for collaborating on classroom instruction. This shift represents a growing trend in education and library and information science (LIS).

Multiple Purposes

John-Steiner et al. (1998) explains that no single model of collaboration adequately explains collaboration or incorporates the diverse purposes served by collaborative efforts. A wide range of purposes for collaborating exist in education. For example, the focus of psychologists-teacher collaboration is to provide a full range of services to students (Pugach & Johnson, 1995).

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[2] "*Resource-based teaching* is a Canadian term that means the use of all types of media in an integrated program in which the librarian/media specialist (L/MS) works closely with teachers to provide printed materials, films and videos, interactive materials such as CD-ROMs, and so on, to create units of instruction" (Mary K. Bolin, Professor and Chair, Technical Services University of Nebraska-Lincoln Libraries, 1999). Resource-based teaching is closely related to e-learning and partially describes what is included in librarians' contribution to collaboration.

Teacher-to-teacher collaboration brings teachers together to work on curricula and classroom content (Pounder, 1998; Leonard & Leonard, 2001). And teacher-researcher collaboration connects theory and practice (Bickel & Hattrup, 1995; John-Steiner, et al., 1998; Clark et al., 1996). Each of these situations involves distinct circumstances, relationships and responsibilities. Collaborative relationships among special educators, for example, include being supportive, facilitative, informative, and prescriptive (Pugach & Johnson, 1995, p. 34). These interactions connote a level of hierarchy that differs from teacher-to-teacher collaboration which Hart (1998) describes as "cooperation of equals" (p. 90).

From examples such as these, and from a taxonomy[3] developed by librarian David Loertscher (1982, 1988, 2000) describing various types of relationships between teachers and librarians, four models of collaboration in educational settings between teachers and librarians become apparent. Each model identifies a unique set of relationships between teachers and librarians ranging from minimal involvement "working together" (Niks, 2004), to working relationships of a highly intellectual nature (John-Steiner et al., 1998; Houston, 1980) in which powerful, dynamic synergy exists between and among collaborators. Figure 1 illustrates a range of involvement between teacher and librarian in planning instruction. Collaborators generally share a common goal. Sometimes the goal is straightforward and undemanding such as making sure all classes visit the library during a given month (Model A: Coordination). Other times more ambitious goals such as full integration of content across the curriculum are undertaken (Models C and D). The range of these types of collaborative efforts will be discussed within each model. (Figure 2)

New Mental Model

Collaboration and cooperation, distinctly different operational processes, are both valued models, but each serves a unique purpose and yields a different return.
~Shirley M. Hord, 1986, p. 22~

Whenever a term such as *collaboration* becomes widely used, it is imperative that terminology be clearly defined (John-Steiner, 1998, p. 775). In this paper, the term collaboration is used as a general term for "working together." This broad use involves many types of endeavors, and while it mirrors the current popular use of collaboration, it does not provide a clear mental model of the range of possibilities of collaborative efforts. The models proposed have been developed to identify unique differences among various collaborative engagements. Each model (Models A, B, C, and D) involves a different level of involvement, expectations, and attributes. Together they create a new mental model for understanding collaboration, which should lead to greater clarity and less ambiguity about what is intended by various collaborative endeavors.
A mental model is a way of understanding something. By mentally laying out pieces of information and then putting them together in a comprehensive way, we create a model for understanding how something works (Gentner & Stevens, 1983). In order to understand the information presented in this paper, a brief explanation about the terms *coordination* and *cooperation* associated with collaboration may be helpful in understanding the new mental model.

Since the appearance of a table entitled "Cooperation, Coordination, and Collaboration: A Table Describing the Elements of Each" in a publication by the Wilder Foundation about organizational collaboration over a decade ago (Mattessich & Monsey, 1992; Mattessich, et al., 2004)[4], the

[3] This taxonomy has come to be known as Loertscher's Taxonomy in LIS although there are actually two taxonomies: The Library Media Specialist Taxonomy which identifies various types of involvement between librarian and teacher, and The Teacher's Taxonomy of Resource-Based Teaching and Learning which describes teachers' involvement with librarians (Loertscher, 1982, 1988, 2000).

[4] The notion that coordination involves a more formal relationship than cooperation shown on the chart in the Wilder Foundation's publication (Mattessich, et al., 2004, p. 61) may come from a classic definition

hierarchy proposed, which begins with *cooperation* and progressing to a higher level, *coordination*, has influenced education and LIS literature on collaboration (Hord, 1986; Buzzeo, n.d.; 2002; Callison, 2003). Based on current usage of these terms in education (Pounder, 1998), library and information science (Montiel-Overall, 2005a, 2005b), and in other domains (Pollard, 2005; Himmelman, 1997), the models discussed in this paper reverse this long held notion by beginning the collaboration continuum with *coordination* and progressing to *cooperation*. (Figure 3) Reasons for the reversed order should become apparent from the description of the models below.

Model A: Coordination

Collaborators often work together in school environments to avoid overlap or working at cross purposes (Hart, 1998, p. 91), and to arrange schedules in order for instruction during the school day to operate more efficiently. In many instances, librarians are responsible for coordination of schedules for library time, story time, and other activities and special functions[5] or regularly scheduled events such as book fairs, spelling bees, and fundraisers (Georgetown Independent School District, n.d.). Librarians may also be required to coordinate technical services and resources such as audio visual equipment and other materials shared by teachers on a regular basis (Lowe, 2000). The responsibility of coordination of other types of events could be carried out also by teacher, principal or other individuals. For example, principals might coordinate schedules between teachers to synchronize planning times or times for instruction in subject areas in order to share instructional materials. In some instances, principals might coordinate teacher schedules to accommodate special needs or to improve delivery of instruction. Principals might also schedule all mathematics and science instruction during morning hours. It is not uncommon for teachers and librarians involved in coordination to consider their efforts collaborative.

Model A may require a minimum amount of communication to coordinate events or schedules. Usually information-sharing involves clarifying instructions so that everything runs smoothly, but face-to-face interaction may not be extensive or even required. Consider for a moment the following example:

"Clovis Unified School District in California combined Toshiba laptop computers and Microsoft Windows 95 and Office Professional software. To ensure that all students have access to laptops, the District bought 200 systems for in-class use and teachers *coordinated* classes to give all students maximum time with the computers. To increase computer exposure further, teachers within each school *coordinated* their teaching and pooled their PCs so students could share them....Careful *coordination* among four classes could quadruple the number of PCs in use when they were needed the most" (Microsoft's Anywhere, Anytime Learning program, http://www.microsoft.com/education/instruction/articles/aal_clovis.asp, June 2001, cited in Heide & Henderson, 2001, p. 22).
This example illustrates Model A. Teachers coordinated classes so that a maximum number of students would be able to use computers. The collaborating teachers leveraged resources and time to improve learning. (Figure 4)

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proposed by Chester Irving Barnard in 1938 of "the formal organization as a 'system of consciously coordinated activities of two or more persons' (Barnard, 1938, p. 73 cited in Johnson, 1998, p. 12).

[5] El Día de los Libros/El Día de los Niños (The Day of the Books/The Day of the Children) celebrated on April 30th in libraries in the United States is an example of a special event coordinated by a school librarian.

Model B: Cooperation

Cooperation...is a term that assumes two or more parties, each with separate and autonomous programs, agree to work together in making all such programs more successful. ~W. Robert Houston 1980, p. 334 ~

Model B is a very common model of collaboration in school environments. In Model B, collaborators cooperate by pooling resources to leverage time, budgets, and energy (Bernard, 1989). Teachers and librarians may share materials, expertise, students, and/or time to facilitate instruction. Although they work together on instruction toward a common goal, they independently plan and implement instruction. In this model, teacher and librarian work on parallel tracks to support or help one another achieve individual goals. Callison (2003) explains "The library media specialist prepares support materials and engages students who come to the library media center in a manner parallel to the teacher..." (p. 199). The following hypothetical example illustrates cooperation between a high school teacher and school librarian:

A high school social studies teacher is preparing students for a review of a unit in American History. The teacher requests assistance from the school librarian to provide student with tradebooks on major themes covered in the instructional unit. The librarian and teacher arrange a time for the librarian to visit the class to provide booktalks on the literature available to them in the library. The teacher also asks the librarian to schedule several class visits to the library to instruct students on the use of reference materials they will need to develop a class study guide. The librarian is also asked to help students use electronic databases in searches for information.

Considerable effort is put forth by the librarian and teacher to cooperate on time, materials, and information but goals, objectives, and desired outcomes for the unit are developed to meet separate objectives. In this example, cooperation results in mutual benefit of teacher and librarian because instruction is enhanced by additional literature about the subject being studied, and increased circulation of materials demonstrates broader use of library services and collections. Collaboration at many schools is defined by this cooperative model. Senator (1995) describes other types of collaboration between teachers and librarian that fit Model B. In one example, a unit of study taught jointly with the librarian and teacher was developed by the "team" leader for others to implement (p. 135). (Figure 5)

Model C: Integrated Instruction

"...integrated instruction is accepted as a powerful technique to show immediate and meaningful application of information..."~D. Callison, 2003, p. 195~

When teachers and librarians work together to jointly plan instructional units that integrate their individual areas of expertise in teaching and learning activities, collaborative efforts reach an intellectual level referred to by John-Steiner et al. (1998) as "thinking together" (p. 776). The joint effort is a creative process in which collaborators are able to develop together what they could not develop alone. The process is dynamic. A synergistic relationship evolves over time as participants jointly plan, implement, and assess instruction.

Model C: Integrated Instruction, integrates subject content and library curriculum. This model is different from Model B because teacher and librarian jointly determine the goals and objectives of instruction. Bailey (1986) recognized this as an essential element over twenty years ago in stating, "Agreement on goals and commitments is an essential ingredient for successful collaboration. Without mutual development of objectives and responsibilities, the trust needed for en enduring relationship cannot develop" (p. 21). TLC on an instructional unit on global warming would result in the following Model C type instruction: Teacher and librarian at an elementary school plan a unit on global warming for a fifth grade class. After several meetings, a unit is designed with jointly developed goals and objectives to provide a learning experience that

integrates teacher and librarian expertise in subject content and library information that will enhance their study. The teacher and librarian jointly introduce global warming to students. Students are assigned to groups to discuss problem-sets about global warming. Students are asked to determine what they know and what they would need to know[6] to address the problems. Planned into the unit are mini lessons for members of the groups to work with the librarian while the teacher worked with the remaining students in class. The librarian and teacher co-plan, co-teach, and co-evaluate various research activities that take students through an inquiry process proposed by Tilley & Callison that integrates media literacy and information literacy through creative thinking and critical thinking (see diagram in Callison, 2003, p. 39). The inquiry process develops critical and creative thinking through media literacy and information literacy (p. 39). As a final project, students present a group project and individual research reports to support the group project. Throughout the unit, teacher and librarian revisit the plan during informal discussions (e-mail, notes, and hallway conversations) to assess students' conceptual development and development of their proficiency using library resources to locate and evaluate references in text and electronic format.

The example demonstrates one type of integrated instruction. Teachers and librarians engage in other types that incorporate related areas of study into meaningful learning experiences intended to help students gain a better understanding of the material presented. The expectation is that improved comprehension will result in improved academic achievement.

This higher level of interaction is best described by Michael Schrage (1989) as "a state of grace we switch into and out of as the moment and the task demand" (p. 13); "a relationship with a dynamic fundamentally different from ordinary communication [with] a sense of creation that transcends individual talent and skill" (p. 34); "a delicious tension between people passionately proclaiming their dispassionate analyses" (p. 35). (Figure 6)

Model D: Integrated Curriculum

In Model D: Integrated Curriculum, the schoolwide curriculum is developed by teachers and librarians as "true partners in the development of the underlying philosophy, pedagogy, and assessment" (Lippincott, n.d., para. 6). This model is the highest level among the four models of collaboration. In 1977, when Appley and Winder discussed collaboration as a new value system that shifted from autonomous, independent planning to an environment of dynamic interaction (p. 280), they were describing the possibilities proposed in Model D. Model D is a qualitatively different way of planning instruction which is interactive and participatory (p. 289). In Model D, teachers and librarians are engaged in school wide curriculum planning similar to what occurred in Model C where teachers and librarians co-planned, co-taught, and co-implemented within the classroom. An integrated curriculum involves faculty in a new role as planners, designers, and developers of curricula that creates continuity and integration (Gamson, 1994).

The principal—In an earlier discussion of Model D (Montiel-Overall, 2005a), the principal was identified as the key to successful collaboration in curricular matters. The principal can make collaboration happen by inviting teachers and librarians to become involved in the development and evaluation of curriculum. This involvement is assured when there is support from the principal. From his experience with successful schools, Evans (1996) states "There is always a powerful principal...In most cases, this principal was one of the co-creators of the school's shared-decision-making and collaborative efforts" (p. 242).
The principal assumes a leadership role to create a vision for the school, and build trust and collaboration among faculty (Sergiovanni, 2005, p. 47). However, the principal's authority can also be distributed to members of the faculty (Evans, 1996; Spillane, et al., 2001) through

[6] This teaching strategy is commonly referred to as KWL. What do I know? What do I want to know? What did I learn?

established structures for teachers and librarians to become involved in curricular decisions. Examples of these structures are task forces, standing curriculum committees and/or ad hoc committees created to give faculty an opportunity provide input into design and evaluation of curriculum (Inger, 1993).

At first glance, this model may appear to present a daunting challenge to collaborators. One might ask, "How can all content areas be aligned with resource-based instruction?" The following situation illustrates that Model D can be extremely effective and efficient. The input of a single librarian can be infused into schoolwide instruction, and teachers and librarian learn what each is doing. This alone is a significant advantage of Model D in transforming education at one school. Every Thursday afternoon, students are dismissed early to provide teachers, librarian, and principal time to discuss curriculum matters. Chairmanship of the committee rotates in order to lighten the responsibility of all members of the committee. A well planned agenda is distributed during the week, and faculty members are encouraged to respond and/or comment by e-mail to items on the agenda. The purpose of the curriculum meetings is to provide a forum for teachers and librarian to think together about how to best utilize instructional time to meet state, national and local standards while addressing the needs of the linguistically and culturally diverse population of the school. The school's current curriculum design accommodates different academic levels using multi-grade literacy, mathematics, and science blocks. Collaboration is highly valued at the school and those previously involved in collaborative efforts are mentors for new members of the faculty or members who request assistance. During the librarian's five-year tenure, ways of engaging students in meaningful inquiry integrating library curriculum and content areas have been implemented and student achievement is above the district norm. At the meetings, plans are shared for integrating content areas and literature-based and resource-based instruction across all grade levels. Professional development has focused on ways to accomplish this. Particular emphasis is placed on accommodating the needs of students through multi-age and multi-level curricula developed for during, before, and after school instruction.

Model D involves coordinated action by collaborators to be successful. That is, plans involving and entire faculty in innovative teaching that moves students in and out of age groups, for example, must be carefully orchestrated. Model D also demonstrates the connectedness of the models inasmuch as cooperation is involved in Model D. Most schools are could characterize their collaborative efforts as involving several models. Few schools, however, involve Models D. Considering the powerful effect of this model (Figure 7), further understanding of the unique characteristics of collaboration required in high level or serious collaboration may help explain why it is so difficult to accomplish.

Section B: Essential Elements of High Level Collaboration

Serious collaboration described in Models C and D involves a complex partnership of *thinking together* to create something innovative that could not have been created by either of the participants by themselves (John-Steiner et al., 1998; Schrage, 1989). Those engaged in collaboration as described in Models C and D, recognize the potential for significant changes in teaching and learning that result from co-planning, co-teaching, and co-implementing instruction (Callison, 1997). Collaborators also recognize the powerful effect on student learning that comes from integrating library curriculum across subject content. The effort seen in Models C and D can be defined as "...a trusting, working relationship between two or more equal participants involved in *shared thinking, shared planning* and *shared creation of innovative, integrated instruction*. Through a shared vision and shared objectives, student learning opportunities are created that integrate teacher and librarian expertise by co-planning, co-implementing, and co-

evaluating students' progress throughout the instructional process in order to improve student learning in all areas of the curriculum"[7] (Montiel-Overall, 2005a.).

Elements of this definition have been discussed previously in greater detail (Montiel-Overall, 2005a, 2000b). As an example, *shared thinking* is described as a relationship in which participants think together and formulate a plan of action that includes the ideas of both teacher and librarian acting as equal partners. An additional element of the definition that deserves further explanation however is *expertise*. As it is used in the definition, teacher and librarian *expertise* describes "ongoing collaborative and discursive construction of tasks, solutions, visions, breakdowns, and innovations" (Engeström & Middleton, 1996, p. 4). This notion of *expertise* derived from Ericsson and Smith (1991) expands the traditional way of thinking about *expertise* as proficiency or knowledge of well-defined areas of specializations (Engeström & Middleton, 1996, p. 4).

Enabling Conditions

Collaboration, like other forms of participation among faculty (Little, 1982, 1987, 1990, 1993; John-Steiner, 1992, 1998; Creamer, 2004), is complex and takes time to develop (Smylie et al., p. 194). There are compelling reasons to engage in them --improved student outcomes and instruction—however there are also difficulties involved in collaboration. Certain conditions and attributes have been identified in the literature that mitigate the difficulty in implementing teacher and librarian collaboration or are essential in developing highly participatory collaboration required in Models C and D. These are 1) adequate resources such as time 2) an environment that supports collaboration, and 3) attributes needed to build collaborative relationships.

Resources

"Collaboration is almost always more time-consuming and more challenging than is acting on one's own..." ~Rubin, 2002, p. 5~

Time—Collaboration described in Models C and D requires certain resources to be successful. Among these are adequate funding and materials, support from administrators, space, and staff (Friend & Cook, 2000). The most frequently cited resource needed for collaboration however is *time* (Johnston, 1997; Bickel & Hattrup, 1995; Houston, 1980). Suggestions for addressing time issues have been proposed in the literature. These include flexible scheduling (Haycock, 1998; Riordan, 1995), coordinated planning periods, and before and after school meetings (Johnston, 1997). Some collaborative efforts involve setting fixed time limits for meetings, and meeting for evening meetings followed by dinner and further discussion (Johnston, 1997, p. 40). Although making time for collaboration is considered essential to collaborative efforts described in Models C and D, the current structure of the school day in some schools leaves little room for collaborative planning. Inger (1993) proposes creative solutions that apply to all types of educational settings (small and large school districts, rural and urban schools, well financed and underfunded schools). These include extended days, flexible release times, and block scheduling as examples of administrative solutions to lack of time for planning during the school day. Electronic communication, messages, notes, and/or telephone conversations are other means of using time more efficiently for collaboration. These means can be used effectively to generate ideas for later discussion at meetings. It should be noted however that Olson and Olson (2000) indicate electronic means of communication is not successful where there is not already present a culture of sharing and collaboration. Other suggestions for improved use of time include commitment to punctuality and good organization and follow-through among collaborators (Inger, 1993).

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[7] Shared thinking is used to describe collaborators *thinking together* (John-Steiner et al., 1998). Shared thinking implies that there is sufficient trust to openly share ideas even though they may not agree with one another.

Environment

Factors involved in successful collaboration include a caring environment; a place where frequent interaction between teachers and librarians can occur; and a place where colleagues respect each other's worldviews.

Caring—Collaboration is more successful in school environments where caring is demonstrated. Caring is described as attentive listening, comforting, honesty, patience, responsibility, providing information for informed decision making, sensitivity, and respect (Taber, 1993 cited in Vance, 2003, para. 2). Demonstrating these attributes is an important enabler in developing a positive working relationship needed for an environment where collaboration might flourish (Appley and Winder, 1977; Noddings, 1984; 1988). In 1971, Milton Mayeroff wrote "In the context of a man's life, caring has a way of ordering his other values and activities around it" (Mayeroff, 1971, p. 2, cited in Appley and Winder, p. 284). Appley & Winder (1977) explain that within a social system caring or concern underlie collaboration by maintaining a balance in reciprocal relationships. That is to say, when *give* and *take* relationships within a system are mutually beneficial, "each member is balanced by her availability to the other as a caring person, by his willingness to make reparation to the other for past injustices, and by his or her recognition to meritorious service performed by the other" (p. 285). Noddings (1988), whose research on an "ethic of caring" between teacher and students provides another way of understanding caring in collaborative relationships. She suggests changes to hierarchical management in educational environments where caring is present. These include changes in the way time is allocated; patterns of interaction and the kinds of relationships encouraged; selection of content; and other practices (p. 221). Arguably, these suggested changes would be equally important in creating conditions for successful collaboration.

Interaction—An equally important enabler of collaborative relationships may be an environment in which daily interaction occurs among faculty members. Little (1982) found that daily interaction was present in successful schools in her study on collegiality and workplace conditions of school success. Interviews conducted in the study revealed that in successful schools, daily interaction occurred formally at meetings but also took place in lunchrooms, hallways, classrooms, and faculty workrooms. The daily interaction resulted in greater involvement among the faculty in exchanging materials, swapping classroom stories, and designing curriculum (p. 329). Interaction among faculty, like caring, would be essential for teacher and librarian collaboration to develop as described in Models C and D.

Shared Worldvie—In much of the literature on collaboration, the importance of shared worldviews is noted (Kuhlthau, 2005; Callison, 2003; Creamer, 2004; Evans, 1996; Schrage, 1989; Shroud, 1982). Schrage (1989) suggests that complementarity of shared worldviews and like-mindedness is essential to ignite new ideas (Schrage, 1989, p. 31). He provides examples from management, art, and science to support the claim. Ideally, these characteristics might be extremely helpful in developing successful collaboration. However, in educational settings teachers and librarians are not at liberty to select their collaborators. In this respect, teacher and librarian implementing collaboration is much more complex. The prescription for collaboration in education and LIS is broad and inclusive. All colleagues are expected to work together regardless of their distinct views. Evans (1996) notes that sharply conflicting views are a challenge to collaborative groups but that learning to talk candidly can be an exciting and involving process (p. 239). TLC thus becomes an opportunity for negotiation, candor, and give and take (Creamer, 2004). Indeed, these are "at the heart of most successful collaborative relationships" and appears to improve collaborative relationships and builds trust (Schrage, 1989, p. 35).

Attributes

Certain characteristics are implied in collaborative relationships. These include trust, respect, and reciprocity and collegiality, and propensity to share. These characteristics progress along a continuum similar to the continuum on which the models progress. The characteristics may develop at a shallow level or at a deep level. For example, in Model A, and to some extent Model B, where the focus may be involve shallow discussions around groupings, schedules, dividing tasks, minimal trust, reciprocity and sharing may occur. These same attributes are necessary in Models C and D, but presumably the collaborative relationships develop at a deeper level.

Trust—The propensity to trust emerges as an essential element for success in most discussions on collaboration (Mayer, et al., 1995; Luna-Reyes et al., 2004). Galvin (1998) explains that it is the lubricant that keeps collaborative efforts from dragging to a halt (p. 57). Although a definition of trust has yet to be agreed upon, it involves at a minimum carrying out agreed upon responsibilities in Model A; follow-through on divided tasks in Model B; and openness of communication and negotiation of conflict in Models C and D. The progression could be seen as moving from shallow to deep trust (Sheppard & Sherman, 1998). As the level of involvement and responsibilities of TLC increases the level of trust becomes deeper in successful collaboration.

Respect—This characteristic is often discussed in relationship to trust because as trust is built greater respect develops. Friend and Cook (2000) explain that "[o]nly after a period of time in which trust, and subsequently respect, are established can school professionals feel relatively secure in fully exploring collaborative relationships" (p. 12). Respect involves knowing a colleague will share accurate information, not divulge confidential information, and treat others with dignity and equality. Respect is demonstrated through multiple interpersonal communication abilities such as effective listening attentively (i.e. not writing or shuffling papers during a conversation), displaying appropriate body language, and demonstrating an openness to others' ideas. This means suspending or eliminating judgment until the meaning is clear (Friend & Cook, 2000, p. 193).

Reciprocity—In a reciprocal relationship, collaborators put forth and equal amount of effort in reaching goals and objectives (Little, 1982). Reciprocity may involve a tacit or explicit understanding that materials, resources, experience, and responsibilities will be mutually exchanged or shared. It is a give and take relationship in which there is an equal exchange of services or resources resulting in a sense of value for each participant.

Collegiality—It is extremely important in developing serious collaborative relationships to foster collegiality. As with other characteristics of collaboration, collegial interactions may range from cordiality during temporary interactions to frequent involvement between collaborators involving intellectual and emotional support. Collegial relationships found in many schools are what Evans (1996) describes as "contrived collegiality (p. 50). Serious collaboration in Models C and D would go well beyond this level. In serious collaboration, colleagues need to see each other as equals, share authority, voluntarily share experiences and expertise, and mutually influence teaching and learning practices. In Models C and D, collegiality among collaborators involves learning from each other to become more effective in their work. They are also willing to implement what they've learned with their collaborator (Friend & Cook, 2000, p. 96).

Propensity to Shar—Perhaps the greatest of these attributes is the propensity to share. This involves being able to share a vision, goals, objectives, information, time, students, materials, space, power, expertise, and more. Propensity to share, like trust, develops over time as collaborators realize personal benefits from working together and recognize benefits for their students.

Section C: Implications

"...the school system, from the first-grade teacher to the principal of the high school, must have some share in the exercise of educational power" ~John Dewey, 1903, p. 196~

In spite of decades of discussions about collaboration, we have much to learn. Suggested within this paper is a way of examining collaboration through four models intended to guide our understanding of current collaborative practices between teachers and librarians. The models are also intended to focus our discussion of collaboration in more specific terms. Situated within education and library and information science, *collaboration* is a phenomenon often used in a broad sense to describe different kinds of working relationships. This discussion proposes a mental model for discussing varying levels of interaction and attributes of these relationships. The mental model proposes a way of examining collaborative efforts by recognizing the context and purpose of the joint efforts. Different ways of working together captured in Models A, B, C, and D, identify distinctions which allow us to develop a "shared language" about collaborative practices between teacher and librarian (Lippincott, n.d.).

The models (Model A, B, C, and D) provide a guide for research on collaboration to answer questions such as: What is the effect of cooperative efforts on student academic achievement? Must teachers and librarians engage in Model A and Model B as a prerequisite to Models C and D? To what extent must trust be developed in each of the models? How do Models C and D get implemented? What is the effect of fragmented collaborative efforts (i.e. one or two teachers and librarians collaborating)? To what extent can Models A, B, C, and D be implemented in environments where no administrative support exists? To what extent is professional development needed to implement high level collaboration demonstrated in Models C and D?

In addition, the models can be used to test hypotheses proposed by Houston in 1980, which have yet to be addressed. These hypotheses include: 1) successful collaboration evolves over time, 2) clear goals facilitate collaboration, 3) short-term goals engender further progress, 4) collaboration decisions are based on experience and lore rather than research and data, 5) collaborative goals are unstable because of shifting interests, and 6) intensity of interest and resources lead to more formal collaboration (p. 343). Further study of these areas would lead us to a greater understanding of teacher and librarian collaboration (TLC).

Finally, this paper has attempted to illustrate that collaboration occurs in all school settings but that the purpose of the collaborative effort may determine the impact it will have on student academic achievement. Models C: Integrated Instruction and Model D: Integrated Curriculum have been identified as high levels of collaboration because it appears that the innovation they supply in connecting information for students provides them with a sense of coherence and consistence that may contribute to their improved learning. Collaboration provides a means to connect instruction in a more holistic way, which may result in improved understanding of information presented. Models C and D are powerful models intended to demonstrate that high level collaboration involves professional relationships that withstand "differences of opinion, worldviews and occasional conflict" (Inger, 1993, para. 6) and have the potential to significantly impact student academic gains. Our goal as educators is to discover what is involved in reaching these levels of collaboration and how they can be sustained.

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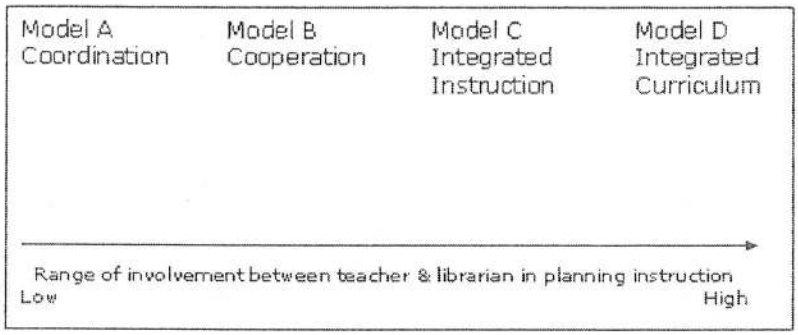
Figure 1
Teacher and Librarian Collaboration Continuum



Teachers have generally relied upon the services of librarians to help them with instructional materials. Model A: Coordination and Model Cooperation involve this kind of collaborative relationship between teacher and librarian. Model C: Integrated Instruction and Model D: Integrated Curriculum reflect a new kind of relationship between teacher and librarian that involves equality between collaborators. This type of relationship develops a better understanding of what is needed for collaborators to fully integrate their expertise across the curriculum.

Figure 2
Models of Collaboration: Examples of Goal and Objectives

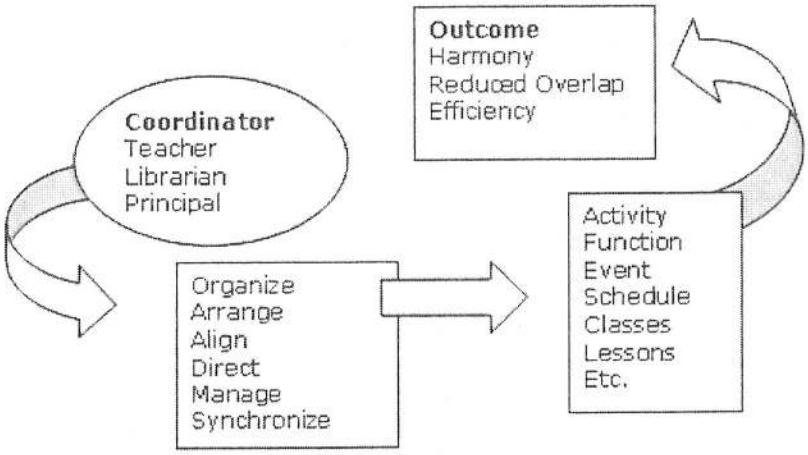
Model	Goals and Objectives	Examples
Model A: Coordination	Arrange activities and events so that there is no overlap Organize structure, budget, time and place so that everything is conducted in an orderly fashion.	All first grade teachers use the computer lab early. When a workshop is planned, someone takes responsibility for contacting participants, making arrangements for meeting space, costs, and materials needed.
Model B: Cooperation	Increase checkout of nonfiction books. Work with teachers in developing literacy.	Teacher and librarian agree to create more opportunities for students to check out nonfiction from the library. Libranan agrees to work with 5th and 1st grade teachers on literacy. Fifth graders will help first graders when they come to the library by sharing booktalks on books selected by the librarian on insects.
Model C: Integrated Instruction	Introduce students to literature related to subject content. Provide students instruction in information seeking as part of a content based research assignment.	Teacher and librarian decide on a collection of fiction and nonfiction literature appropriate for a unit on world leaders. Teacher and librarian agree what students will need to know in order to complete a research report in groups. Standards are discussed during the planning process, and co-implementation and assessment process.
Model D: Integrated Curriculum	Integrate content and library curriculum across the curriculum.	Teachers and librarian (and perhaps the principal) meet regularly to discuss innovative ways to connect what students are learning. Language arts is integrated in all subject. Creative writing could be carried out in a science class. Literature that supports instruction is considered at every grade level. Information literacy is included as part of the instruction of all content areas.

Each model has different goals and objectives. The impact on student academic achievement may relate to the types of educational goals and objectives involved in the working relationships between teachers and librarians.

Figure 3 A New Mental Model of Collaboration for Teachers and Librarians

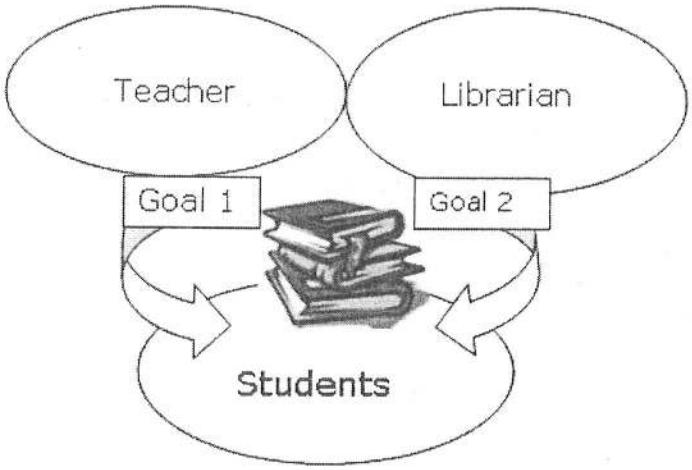
	COLLABORATION			
	Model A: Coordination	Model B: Cooperation	Model C: Integrated Instruction	Model D: Integrated Curriculum
Participant	Designated coordinator to work on project or assignment.	Teacher, Librarian	Teacher(s), Librarian	Teachers, Librarian, (Principal)
Goals and Objectives	Organize, manage, and/or direct events, lessons or activities to ensure efficiency and eliminate overlap of.	Tasks and responsibilities are divided. Individually developed plans are designed to work together for mutual benefit.	Integrate subject content (math, science, language arts, etc.) with library curriculum (collection, references, resources to develop information literacy).	Integrate subject content and library instruction across the curriculum
Impact on Student Academic Achievement	Minimal impact may result. Time is used more efficiently for teaching.	Some impact to improved learning. Students have the perspective of two individuals.	Impact may be significant. A connection between subjects helps students understand content and improves knowledge through multiple sources (references, literature, etc.) Research ability greatly improved and made more meaningful since it is contextualized.	Impact is significant. Students begin to see relationships of all content being studied. Relevance of content areas to real life and to student activities throughout the school day and to the use of library and instruction in library curriculum becomes more apparent to students. Innovation of curriculum increases motivation and interest in learning.
Characteristics Attributes	Shallow trust	Trust/ Respect Reciprocity	Deep trust/Respect Reciprocity Propensity to share	Deep trust/Respect Reciprocity Propensity to share

Figure 4 Model A: Coordination



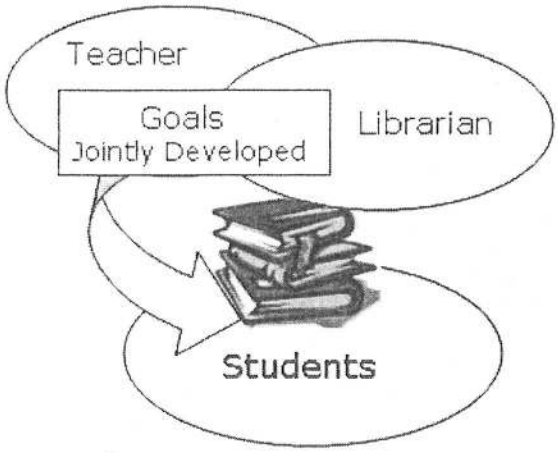
Model A: Coordination
This model is implemented in some fashion in almost every school. It involves two or more participants working together to accomplish something that benefits either or both of them or their partners by making things run more efficiently. The circle represents individuals who often undertake the role of coordinator in school settings. One or more individuals represented in the circle could take the lead in organizing, managing, and/or synchronizing and event, activity, lesson, unit or schedule, etc. These are identified in the first box. The second box identifies the kinds of activities that might be coordinated. The arrow leads to the result of coordination. The process is not as important as the outcome in this model.

Figure 5 Model B: Cooperation



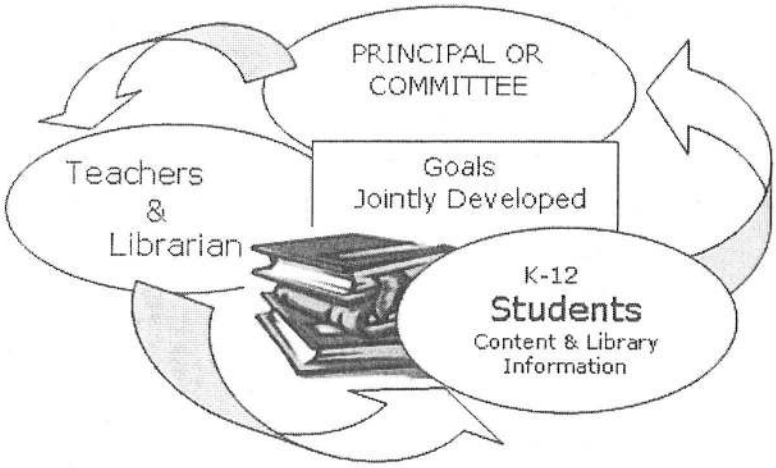
Model B: Cooperation
In this model, teacher and librarian work together but each has a separate goal for instruction. Goals are not coordinated. Teacher and librarian may agree to teach an activity, lesson or unit together for mutual benefit. However, instruction is not planned jointly and may not be sequenced (Bruner, 1968). In this model, work is often divided and each instructor is responsible for one aspect of the instruction. There may be an overlap of instruction.

Figure 6 Model C: Integrated Instruction



Model C: Integrated Instruction
In this model, teacher and librarian collaborate on activities, lessons, units by thinking about how to integrate what each wants to teach. Besides thinking together, TLC involves co-teaching, and co-evaluation. The synergy created fosters innovation and creativity. Students recognize the benefit of integrated instruction. They draw connections, and develop a better understanding of content and library information.

Figure 7 Model D: Integrated Curriculum



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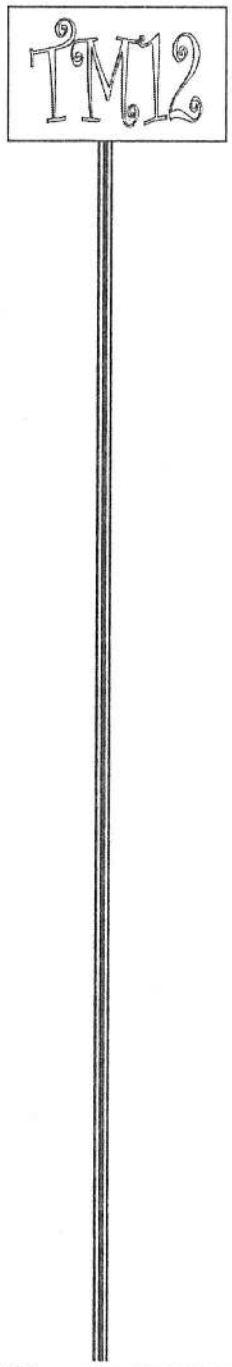
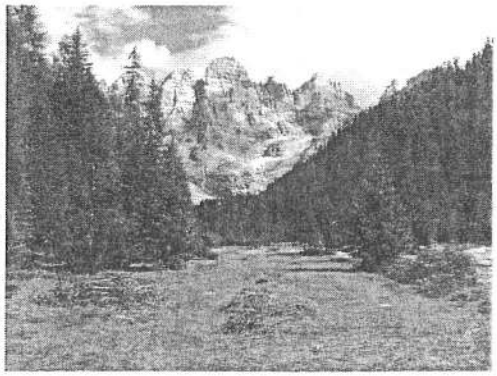


Part 2

Research Studies and Research Proposals



"It'd be really dumb not to use it."

Virtual Libraries—Their Influence on High School Students Information Seeking and Use

A Focus Group Investigation

Joyce Kasman Valenza

Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

"It'd be really dumb not to use it." Virtual Libraries—Their Influence on High School Students Information Seeking and Use: A Focus Group Investigation

Abstract

If today's students are truly "born with the chip," today's school library will be expected to achieve its mission for learners both physically and virtually. The 21st century *virtual* school library should have as broad an influence as its physical counterpart, expanding and reinterpreting library service, meeting young users' information needs where they live, play, and work—on the Web. The researcher/librarian conducted focus group discussions with seniors at Springfield Township High School to better understand their long term experience with school's Virtual Library. Findings revealed that across achievement levels, students experienced satisfaction and relied heavily on the site for academic research. The students, from both honors and regular academic classes, universally appreciated the site's access to databases, documentation guidance, pathfinders, and school-specific research tools. Students viewed the site as a quality filter and attributed their confidence in finding information efficiently to their use of the website. Users reported that they experienced greater success with their Virtual Library than they had using commercial search tools. Students described research habits that extended well beyond the *satisficing* behaviors attributed to young people in other studies. This exploratory pilot offers an informing snapshot of a population of users with the benefit of a hybrid learning experience, a library website that has become a critical part of a school's learning culture.

Theoretical Background

The school virtual library offers young people independence while it offers intervention--guiding learners as they navigate through the complicated, often overwhelming processes of accessing and using information. More than ever, librarians are needed to intervene, to tame the chaos of information glut with customized, user-centered interfaces that create order while they offer instruction.

The effective virtual school library offers 24/7 accessibility, just-in-time / just-for-me learning opportunities, and customized resources. Virtual libraries allow teacher-librarians to apply their traditional skills for collection development, collaboration, reference, and instruction in powerful new ways in highly populated, new information landscapes. They allow learners independence as they allow teacher/librarians opportunities for intervention. As scalable strategies, virtual libraries allow librarians and educators to guide unlimited numbers of students—onsite, at home, or otherwise distant. Through their virtual libraries, teacher librarians can extend their three roles as defined in *Information Power* (AASL and AECT, 1998) learning and teaching, information access and delivery, and program administration.

School virtual libraries have powerful potential, perhaps beyond the potential of academic and public libraries. In addition to a clear mission set out by *Information Power*, teacher-librarians serve generally smaller, more homogeneous populations. Effective teacher-librarians regularly collaborate with teachers. They have clear understandings of the curriculum for the grade levels and content areas that are within the sphere of a limited learning community, providing extraordinary opportunities for customized online instruction and guidance.

Statement of the Problem

While studies of the effectiveness of online interfaces exist for public and academic library environments, little serious research examines the effectiveness of *school* library service online, student response to online service, and specific criteria for evaluation of virtual library interfaces.

SchoolLibrary.NET (Milbury, Woolls, and Loertscher, 2005) compiles a growing directory of several hundred school library sites submitted by teacher-librarians around the world. This directory represents a variety of professional efforts, ranging from single-page *library brochures* to dynamic, multi-page learning environments.

Though studies of secondary students' use of the Internet largely examine the behaviors of novice information-seekers, those without the benefit of the online presence of a librarian, few studies address the influence of teacher-librarian guidance through the framework of a learner-centered virtual library interface.

Goals and Objectives

Clearly, the hundreds of school virtual library efforts are not equally effective. Their disparity, compounded by students' growing need for online intervention, suggests critical research questions: How do students respond to virtual access to resources and guidance? What online resources do students value? Do effective school virtual libraries reduce students' cognitive load in the face of *info-glut*? Is student behavior affected by customized online service and guidance? To what extent are these interfaces effective environments for information access and for learning? How would student users suggest improvements?

The focus of this study was to explore the influence school library websites have on student information seeking behavior. High school seniors were selected for their long-term use, familiarity, and experience with a library interface.

After nearly 9 years of maintaining a school library site, six at Springfield Township High School, the researcher/librarian wondered how her online efforts affected student research. Did the Virtual Library achieve its goals of ensuring students were effective users of ideas and information? Was it user-friendly? Was it user centered? Specifically, the researcher wanted to learn about student users' perceptions and appreciation of the library site. Did it increase awareness of search options including the existence of subscription databases? Did it change student information seeking habits? How did students believe the website affected their high school research experiences? In a Google-reliant world, would students be motivated to begin their searches in an alternate interface, even if that interface was customized to meet their specific information needs?

Because of the broad range of academic abilities across any high school community, the researcher wanted to examine students of varying achievement levels to determine if students involved in advanced placement classes would approach the website in ways different from general academic students. This study reports the findings of focus group interviews with four groups of Springfield Township High School seniors and is a pilot for a larger study of school library websites identified as examples of best practice. The full study will be described in the researcher's upcoming dissertation.

Literature Review

What are Virtual Libraries?

The terms *virtual library*, *digital library*, *electronic library*, *cyberlibrary*, and *library website* are used in the literature of information science and education to describe such dissimilar efforts as: national libraries; the archives of major organizations; the specialized digitized text, image, and media archives of museums and universities; aggregated commercial databases; as well as the focus of this study--library websites developed by teacher-librarians to serve their own user groups—predominantly learners.

Researchers reflect this confusion relating to language. Saracevic and Dalbello (2001) as well as Kassim and Kochtanek (2003) note there is no accepted definition of the term *digital library*.

Jefcoate (1998) contends that the terms *digital* or *electronic* library are used predominantly to refer to the storage and access functions of online library interfaces. Perhaps the most heavily-cited definition, developed by the Digital Library Federation (Greenstein, 2000), stretches Jefcoate's definition, recognizing the professional efforts of staff and the importance of understanding an interface's community of users.

Johanson, Schauder, and Lim (1998) warn that using the terms *electronic*, *digital*, and *virtual libraries* interchangeably would be inaccurate. They suggest that the term *virtual library* implies something greater, something far more cleverly structured than a *databased* aggregation of digital materials. The researchers use the term *virtual library* to refer to a logical system with self-evident authoritativeness.

Virtual school libraries generally extend their services beyond the creation of structure and authority in their attempts to implement instructional missions. Distinguished from sites that merely house archives or collect bookmarks, virtual libraries in educational institutions can reach beyond intellectual access, exploiting the professional skills of the librarian to offer instruction in information literacy, as outlined in *Information Power: Building Partnerships for Learning* (AASL & AECT, 1998). Marchionini and Mauer (1995) describe such efforts as "building intellectual infrastructures" (Digital Libraries in Education: Promises, Challenges and Issues section, ¶ 6) and point to their potential for creating communities of learners. Neuman (1997) cites several studies that point to virtual libraries as venues for higher level thinking and learning. Marchionini, Plaisant, and Komlodi (1998) echo Neuman's conclusions. "Digital libraries are the logical extensions and augmentations of physical libraries" and in addition to amplifying existing resources, "they enable new kinds of human problem solving and expression" (p. 536).

Though researchers continue to disagree over terminology, this study will use the term *virtual library* as an aggregated and enhanced definition. For the purpose of this study, a *school virtual library* is a customized, structured online learning environment / community, developed by a teacher-librarian to improve and extend the services and mission of the library program to the learning community.

Students and their Information Habits

No longer limited to the traditional collections physically available in their school libraries, or the content of their textbooks, today's student researchers confront an explosion of information choices. High school students, who have literally grown up on the Web, prefer it as a primary information outlet (Levin, Arafeh, Lenhart, and Rainie, 2002; Jones and Madden, 2002; Tenopir, 2003). They have high expectations for information speed and convenience and high expectations for library service (Abram and Luther, 2004). Though the popular literature attributes near guru status to young people, researchers observe that students need more instruction, as well as the support of improved interface design, if they are to become effective seekers and users of information. Virtual libraries address young users' needs on both fronts.

A Pew Internet and American Life study, *The Digital Disconnect:The Widening Gap Between Internet-Savvy Students and their Schools* (Levin et al., 2000) finds that most students (78 percent) prefer to use the Internet for research and homework. Tenopir (2003) notes high school and college students use the Internet more than their libraries. But she warns that their quality judgments about Internet materials "may not exactly match faculty criteria" (p.32).

College students, just one year beyond our high school seniors, may not be prepared to recognize quality or to realize their broader search options. According to the Pew study *Internet Goes to College* (Jones and Madden, 2002), nearly three quarters of students (73%) report that they use the Internet more than the library. When they are using the Internet for research, they make use of commercial search engines and generally ignore their library's rich online resources because they don't know how to find them.

Students and their Information Issues

It is natural for students to face challenges finding, evaluating, and using information. They confront a trillion-page Web--a Web created primarily for adults. It is natural for users of any age to be baffled by the multiplicity of search choices offered by the Web—the online databases, subject directories, portals, and the millions of pages that comprise what we call the Invisible Web, most notably the subscription databases in which libraries invest so heavily.

While popular media attribute near guru status to young adults (Tapscott, 1997; Levin, Arafeh, Lenhart, and Rainie, 2002; Prensky, 1998), our own literature, the literature of library and information science, documents students' feelings of confusion and frustration and less-than-effective approaches when interacting with information technologies. Research reveals troubling data relating to students' searching capabilities, their abilities to navigate the Web to find the resources they need for academic research, and their understandings of search environments, despite common feelings of self-efficacy.

Students have trouble naming their information needs. Limited vocabulary and the inability to predict category patterns are prevalent cognitive issues. Brown (1995) found that 65-80% of subject search terms used by students from third grade through college fail to match the subject headings of electronic search tools. Shenton and Dixon (2004) observed similar naming problems with students representing their information needs in search terms. Large and Beheshti (2000) observed that sixth-grade students had trouble selecting appropriate search terms and that the problem was compounded when they had to search multi-term concepts. Few students did not considered synonyms or related terms.

In addition to their own developmental learning issues, young people come face-to-face with information glut as they confront hundreds of choices for any information task. Which search tools should they use for a particular information task—search engines, subject directories, subject portals, subscription databases? Which search strategies should they employ within each chosen search tool? How should they evaluate their overwhelming lists of results? What does quality look like? How should they document the sources they select? Jacobson and Ignacio (1997) discuss this confusion and describe the Internet as a "librarian's nightmare" for its lack of standardization. Agosto (2002) notes that students experience cognitive constraints in the form of information overload both within individual sites and with the Web as a whole. She describes students' overwhelming choice of websites as *outcome overload* and discusses the negative impact of this overload on student decision making, applying Simon's (1955) behavioral decision-making models of bounded rationality and *satisticing* to young adult information seeking, *Satisficing* is selecting decision outcomes that are good enough to suit decision maker's purposes, though not necessarily optimal--a blend of *sufficing* and *satisfying*. Student participants often stop searching before they reached a *satisficing* choice and select disappointing sources. For some students, the major decision making *stop rule*, is the first acceptable option they came across. Reminiscent of Gross (1999), Agosto's students describe a dichotomy of tasks—the imposed query, as when there is a teacher-designed task and deadline for a school project, and the self-generated search.

The *2003 OCLC Environmental Scan* (De Rosa, Dempsey, and Wilson, 2003) identifies major trends and patterns of change in the information landscape and its users. The report points to three changes among all information consumers. In terms of *service*, users are moving to self-sufficiency. Users see their worlds as *seamless*; they view their academic, leisure, and work worlds as fused. And echoing the finding relating to *satisficing*, in terms of *satisfaction*, information consumers are largely satisfied with the quality of the information they find, even though information professionals might not deem those materials satisfactory.

A Pew Internet & American Life Project study, *Search Engine Users: Internet Searchers are Confident, Satisfied and Trusting — But They are Also Unaware and Naïve* (Fallows, 2005), looks at the public's trust in free Web search engines. Most users, especially young people, "paint a very rosy picture of their online search experiences." Users are in control and feel confident. They are satisfied with their results. They see their favorite search engines as fair and unbiased sources of information and are largely unaware of alternative search tools.

Fidel et al. (1999) point to high school students' difficulties using the Web, the need for training, and the need for improved system design informed by examination of users' seeking and searching behaviors. The Fidel study notes that students know little about the various search choices available to them and are glad to be told where they might start. The research team observed significant student inefficiency and frustration, and conclude that training is needed and that search environments can be much improved.

Neuman (1997) describes high school students as novices in terms of their understanding of the research process. Students often choose inappropriate databases, had naïve and inflexible conceptions of how information is organized, and often misunderstood the structures of the electronic information resources they use.

The Importance of Mental Models and Navigation Aids

School virtual libraries attempt to organize the Web and other information sources for students through their use of image maps and other types of visual and text-based structures. Research points to a strong need for this type of guidance. Pitts (1995), Marchionini (1989), Neuman (1997), and Slone (2002) conclude that students have limited mental models for information seeking and lack the necessary framework for understanding information organization and the types of information available to them. Marchionini and Teague (1987) and Liebscher and Marchionini (1988) point to the need to create mental models to help users better understand information structures and navigate electronic environments. Large, Beheshti, Nesset, and Bowler (2004) conclude that student searching is improved when they are navigating venues that offer clues in a variety of media. In their study of adolescents' use of the *Science Library Catalog*, Borgman, Hirsh, Walter, and Gallagher (1995) explore and confirm the importance of hierarchal subject categories as recognition devices to aid in searching. Neuman's (1993, 1995, 1997) studies of high school students' interactions with online information resources reveals that students' compelling misunderstandings of database structures sabotage their independent use of these resources.

Nilan (1995) notes that navigational metaphors make particular sense when groups of users have some shared sense of the meaning of the metaphor. In the case of school virtual libraries, the in-person instruction of the teacher-librarian helps to reinforce the meaning of a common metaphor or structure for a student population who also use the site remotely.

Barker (1998) emphasizes the importance of mental models in the design of educational interfaces as cognitive structures. According to Barker, virtual libraries are themselves navigational metaphors that facilitate knowledge transfer between domains of knowledge and enable users to find their way around computer-based systems. Barker concludes, "the design of effective and efficient end-user interfaces that are able to stimulate the development of rich mental models will be of vital importance to the successful use of digital libraries as a teaching and learning tool" (End-User Interface Issues section, ¶ 3).

Fidel et al. (1999) note that students seek landmarks or graphical clues as they navigate the Web. Comparing the Web to a shopping mall where store windows must visually attract visitors, the researchers recommend that system designers recognize the importance of graphical guides for searchers.

Marchionini, Plaisant, and Komlodi (1998) identify principles to consider in the design of digital libraries. Among the design goals they point to are minimizing "disorientation by reducing navigation," "anchoring users in a consistent context" and supporting "rapid relevance decisions through overviews and previews" (p. 535).

Park and Hannafin (1993) identify twenty empirically-based principles relating to the organization of information. Among the most relevant of the principles for virtual libraries is that knowledge should be organized to reflect the learner's familiarity with the content, the nature of the learning task, and assumptions about the structure of knowledge. The researchers also note the importance of providing concept maps to indicate relationships among concepts and providing hypermaps to visually guide learners to relevant instructional tools.

Marchionini and Maurer (1995) argue that virtual library interfaces play central roles in guiding learners through the research process both in the library and remotely.

> At the nexus of physical and intellectual infrastructure is the interface to the digital library...Good interfaces will allow learners to take advantage of digital resources equally well in classrooms, homes, and offices. ("Digital Libraries in Education: Promises, Challenges and Issues" section, ¶ 8)

Online Interventions and Emerging Instructional Roles for Librarians

School libraries share specific missions different from those of special, academic, and public libraries. According to *Information Power: Building Partnerships for Learning* (AASL and AECT, 1998), the mission of the school library is, "to ensure that students and staff are effective users of ideas and information" (p. 6). The document explains that this mission is accomplished through seven goals. By organizing collections of information in a single interface to serve the *curricular mission* of the school, as well as the *learning missions* of the school library program, school virtual libraries can clearly translate and serve and extend at least four of *Information Power's* established goals:

- to provide intellectual access to information through learning activities
- to provide physical access to information through a carefully selected and systematically organized local collection of diverse learning resources
- to provide learning experiences that encourage students and others to become discriminating consumers and skilled creators of information . .
- to provide a program that functions as the information center of the school (pp. 6-7).

Wang (2003) suggests that virtual libraries "should provide the infrastructure for supporting the creation, assimilation and leverage of knowledge" (p. 113) and ought to be constructed by examining the needs of learners, their learning priorities, and the mission of the organization.

Jenny Levine (2004), well known as the Web's Shifted Librarian, describes major differences in our students' approach to information use and the need for librarians to intervene on *their* turf, and to make their professional intervention portable. Levine suggests, "librarians have to start adjusting now. I call that adjustment 'shifting' because I think you have to start meeting these kids' information needs in their world, not yours. The library has to become more portable or 'shifted.'" (¶ 7 and 8)

Kuhlthau (1997) describes virtual libraries as offering new zones of intervention for librarians and encourages librarians to design such systems through which they can accommodate, guide, and coach learners. She argues that virtual libraries help students internalize the process of learning from information and that through them librarians can effectively move students from uncertainty to understanding. "Librarians play a critical role in creating environments that foster meaningful and lasting learning in digital libraries" (Challenges for Librarians Section, ¶ 2). Kuhlthau (1999) describes the importance of students determining when *enough* information is found. When librarians intervene to create customized virtual libraries to meet the needs of specific learners, students are less likely to be overwhelmed by irrelevant information options. Kuhlthau (1997) further, sees virtual libraries as constructivist learning environments and argues that when virtual libraries are truly user-centered, learners' goals shift from merely accessing information to gaining new understandings of the learning process.

Clyde (1997) notes that a *home page*, moves a school library "from being a user of online information to being an online information provider" ("Rationale: Why have a home page?" section, ¶ 1). Clyde sees the virtual library's primary purpose as instructional--the delivery of "information skills that will be the essential life skills of the information age" (Introduction, ¶ 1).

Neuman (1997) recognizes the value of virtual libraries in gathering the specific information resources students are likely to need. She sees the virtual library as "an essential venue for learning the concepts and skills necessary for conducting research and handling information in an information age" (p.79). Neuman also notes that teacher-librarians who study use, can improve their online instructional practice.

Virtual libraries offer opportunities for what constructivist educator Margaret Riel (1998) labels *just-in-time learning*—learning that is both time- and place-independent. Jasinski (1998) echoes Riel and notes that well-designed, customized online instructional environments can significantly improve learning, by providing opportunities for improved access and "just-in-time, just-enough and where-I-am learning" ("Individual learning model" section, ¶4).

Marchionini and Maurer (1995) describe and predict the future of the virtual library medium in the school environment. They point to the ability of virtual libraries to break down physical barriers and facilitate communication "outside the formal learning environment" ("How do libraries support teaching and learning?" section ¶ 9).

Roes (2001) argues that online intervention is a critical role for librarians in educational settings--there is no excuse for librarians "to wait and see." The role of the librarian off- and online is to "to support teaching and learning, and to develop relationships with faculty further and in the direction of supporting their teaching." Roes believes librarians must develop their "unique skills to support educational innovation" and function as role models for their institutions.

Evaluation of Virtual Libraries

Little research exists on evaluating school virtual libraries. Bruce and Leander (1997) note that research is heavy in virtual libraries for specialized workplaces, but see an unrealized potential for the development of educational digital libraries. They argue for the evaluation of school virtual libraries by observing their use in the context of their individual educational goals and their use of current technologies. In terms of design, the researchers suggest that to be most effective, virtual libraries should be customized and that the librarians who create them must examine their use by students and educators as searchers –"who they are, what their practices and needs are, and what we expect them to know" ("Search for information and meaning" section, ¶ 3).

Saracevic and Covi (2000) conclude that evaluation of digital libraries "has yet to penetrate research, practice, or even debate" and advocate evaluation efforts may lead to improved access and use "across the landscape of digital libraries" (p.11). They admit that it is too early to set standards which might "freeze innovation," but note that it is not too early to urge professionals to consider evaluation as a critical part of digital library evolution. Saracevic (2000) both asks and partially answers the ultimate question: "How are digital libraries transforming research, education, learning, and living? At this stage we don't have the answers, but we have indications that significant transformations are indeed taking place" (p. 368). Wang (2003) notes that educational virtual libraries should be maintained and modified according to user feedback, specifically relating to success and failure navigating the interface and unanticipated results.

Clyde's (1997, 2000) research centers specifically on the evolution and the evaluation of school virtual libraries. Clyde's compelling rationale for creating school library websites includes:

- demonstrating the role of librarian in information skills development;
- contributing to the development of a school information center on the Web;
- seizing a critical opportunity to promote the school library and the information technology skills of its staff;
- promoting collections, activities, and services; and
- offering guides to information sources in such forms as pathfinders, style sheets, tutorials; and making the library catalog widely available.

Clyde's rationale offers a base for evaluation efforts. Regrettably, while in 1997, Clyde saw endless possibilities, her early, small-scale content analysis revealed that most existing sites lacked purpose and made little effort to identify their users' needs. Clyde's (1999) longitudinal analysis of school library websites attempted to identify the most popular pages and features, to point to effective design models, and to develop *quality indicators* observed in the current state-of-the-art.

Methodology

The researcher conducted four focus group interviews with high school seniors in an attempt to gain a clearer sense of *why* and *how* students use a virtual library site. She sought to get a snapshot of the environment, to better understand students' experiences and behaviors using or not using the site for school research.

Focus groups are used to gain deeper insights into attitudes, opinions, experiences, needs, and concerns. The method was selected because the researcher believes that the opinions of learners are critical in understanding their use and information-seeking behaviors, and in planning and improving instruction and service. Focus group interactions also allow researchers to observe levels of consensus and disagreement in both words and body language.

Students were asked to reflect on their long-term experience using the virtual library interface. Specific questions addressed patterns of use—the *whys* and *whens*, the features students most value, how those features help them with their research, what problems and flaws students encounter with the interface, and improvements or additional features students would like to see. A full list of questions is appended.

The researcher sought and was granted approval for all components of the study from the Institutional Review Board at the University of North Texas. She videotaped and transcribed the discussions. The transcribed discussions, as well as qualitative data gathered from the Web-based survey, were coded using WEFT QDA 9.6

Students were purposively selected as peer groups to inspire relaxed and easy discussion in the hope that individuals who shared commonalities would more likely share information with others like them. The researcher selected volunteer students from both Advanced Placement and regular academic classes to compare student responses in homogenous peer groups. Would honor students be more serious users of the Virtual Library? Would they employ more sophisticated information behaviors? Or was the influence of the Virtual Library broader, more universal, influencing the larger school population?

Volunteers were solicited from groups of Springfield Township High School students participating in the Web-based student survey also conducted during the first week of May 2005. Two of the groups were pulled from one Advanced Placement English class. The other two groups were pulled from two visiting Global Studies classes. The researcher selected the first students willing to volunteer from each of the classes. The first group was girls only; the other three groups were mixed gender. The groups were ethnically mixed, and roughly reflected the 20% minority (predominantly African American) population of the school.

The four groups were composed as follows:

- Group 1: Seven girls from AP English
- Group 2: Six students—four girls, two boys—from AP English
- Group 3: Seven students—four girls, three boys—from regular academic Global Studies
- Group 4: Six students—three girls, three boys—from regular academic Global Studies

Students 18-years-old and over signed a consent form prior to the discussions. Students younger than 18 submitted signed parent consent forms. Students appeared eager to participate and equally eager to be released from class. Following certain housekeeping details—adjusting the camera, assuring that students were comfortably seated, and collecting consent forms, the researcher explained the purpose of the study, assured students that their responses would be anonymous, and assured students that she sought their honest responses and was sincerely interested in learning from their experiences. Students sat in a semicircle in the library office in comfortable, upholstered chairs. They were offered refreshments. Each of the four discussions lasted approximately 30 minutes.
The groups were sensitized to the focus group discussion questions, having first participated in the Web-based survey about the library website.

These four focus group interviews are one component of a larger mixed-method study which includes a Web-based survey of high school seniors in 17 schools with websites identified as *best practice* and a content analysis of those websites. The researcher will describe the results of the larger study in her

dissertation. Three open-ended questions on the Web-based survey were also analyzed to validate the focus group responses.

Background: About the Virtual Library

The Virtual Library has been in existence at Springfield Township since the current librarian arrived in September 1998. In 2001 the site won the IASL/Concord School Library Website of the Year Award (IASL, 2003). According to web counting software, over the course of the last school year, the site hosted 15,142 visitors per month. Students use the website when they are not at school. Though the counter software used does not allow differentiation of Springfield Township student users from non-student users, approximately 15% of total website use occurs on Saturdays and Sundays and 38 % of usage occurs during the hours after school.

The homepage is an image map, a metaphor representing a physical library. The image of the librarian invites email help. Among other features, the homepage leads to:

- *Catalogs and Databases* which displays icons for the library's own subscription databases, those funded by the state of Pennsylvania, the library's online catalog, e-books collections, the statewide interlibrary loan catalog and the online catalogs of the local public library and two nearby universities. The library staff regularly updates and distributes a list of passwords for the databases for students' home use.
- *Online Lessons* which links student to an archive of many of the lessons, handouts, and assessment tools developed by teachers in collaboration with the librarian.
- *Research Guide*, formerly a lengthy print document, it describes school expectations and presents models for preparing formal papers and projects.
- *Reference Desk* which leads students to free online almanacs, dictionaries, encyclopedias.
- *MLA Style Sheet* which leads students to documentation advice and models. At the request of the Science Department, the librarian recently added APA examples to this page.
- *Pathfinders*, a collection of librarian-created guides to resources supporting major student projects and types of projects. Pathfinders include: Social Issues, Literary Criticism, Primary Sources, Nations and Travel, Doing the Decades, Elizabethan/Shakespeare, the Middle Ages, Health and Diseases, College Search, and Streaming Video Resources.
- *Search Tools*, which lists and categorizes a wide variety of search tool choices for the free Web.
- Students also have one-click access to the Noodle Tools citation generator and to Turnitin.com, used for checking drafts of their work for originality.

Background: About the School

Springfield Township is a suburban high school located just outside the Philadelphia city border. The student population of 900 students includes grades 8 through 12. The school community is experiencing growth as families from the city seek to move to the suburbs for the reputation of the small suburban district. The 2005 senior class consisted of 132 students. A total of 78% of them planned to continue to higher education, with 67% attending 4-year colleges and 11% attending 2-year colleges.

The school offers include six Advanced Placement courses (English, US History, Calculus, Physics, Statistics, Computer Science and Environmental Science). Honors courses are also offered in English, Social Studies, Mathematics and Science.

As a culminating graduation requirement, 12th grade students complete Senior Seminar, a course that requires students to create an independent project based upon an area of interest. In addition to the project, students write a research paper and incorporate technology in a formal presentation to faculty and peers. The course assesses students' grasp of information and communication fluencies learned over their high school careers.

Assumptions

The researcher assumed that Springfield Township seniors were not novice information seekers. Springfield students are consistently involved in research projects for the five years of their high school careers. For the past four years, Springfield Township has focused efforts on improving student research. Courses and units examine essential questions. Student projects are inquiry- and thesis-driven. The principal requires one of each of the teachers' annual professional goals to address improving student research skills. Most of the seniors interviewed in the focus groups experienced four or five years of Virtual Library use, a hybrid experience involving both independent use and instruction occurring as they visited with their classes. The researcher/librarian regularly distributes passwords lists to students visiting individually and with their classes promoting the use of subscription databases at home. A school-wide Research Integrity Policy (http://mciu.org/~spjvweb/acadintegrity.html) defines plagiarism and lists its potential consequences.

Students are encouraged to reflect on the effectiveness of their research. Teachers are expected to reflect on their own practice. Focus groups are part of the larger school culture. Over the past two years the researcher and other members of the school faculty have conducted focus groups with students to explore such issues as student motivation, diversity, and effectiveness of rubrics as tools to guide learners. For the past five years the researcher has been conducting exit interviews with seniors to better understand their learning relating to research and information fluency skills.

Limitations of the Study

Students in the four groups knew the researcher/moderator as their librarian. Finding a qualified, trained moderator presented a challenge with time running out before seniors left school for their internships, the LEAP Program, in mid-May. The researcher/librarian opted to function as moderator because of her unique understanding of the interface and because of her connections with the students. The existing relationships with the students allowed her to create a relaxed, informal atmosphere in which encouraged the students to freely express opinions. Indeed, the students appeared comfortable and participated with enthusiasm and energy. Their honesty was confirmed by the more anonymous Web-based survey in which student response to three qualitative items mirrored the responses of the students in the focus groups. Though the 26 students in the discussions also completed the Web-based survey creating overlap, an additional 30 students provided remarkably resonant responses.

Though it is possible the students wanted to please the librarian/researcher, due to long-established relationships, students were encouraged to respond honestly and were assured their anonymity would be respected. The researcher was mindful of maintaining a climate in which students were comfortable in expressing their feelings freely. Students interviewed were merely three weeks away from graduation and felt little academic pressure to respond in a positive manner.
Like other students in schools with virtual libraries, Springfield students live in a hybrid environment. Though Springfield's Virtual Library exists in cyberspace, it also *lives* in the students' physical learning space. It is part of the school culture. The librarian and the faculty use it as an instructional tool. Teachers contribute to its growth and rely on it in their classes for reinforcing learning. It houses an archive of collaborative lessons, handouts, and student tools. Students use the site independently when they are in school and when they are home or otherwise remote. Findings relating to student use of the website also relate to its interconnected influence within the school culture of teaching and learning.

The four focus groups displayed strong group-to-group validation. In fact, the degree of consensus within and across the groups was extraordinary. Although it might be expected that honors or Advanced Placement students would approach the discussion or their work more seriously than general academic classes, each of the groups responded thoughtfully and discussed their research experiences with evident pride. Each described similar satisfaction and similar issues with the interface.

In each group, students were classmates and appeared comfortable and secure in their peer groups. The groups shared common research assignments and experiences and, in discussions, built on each others' comments. The interaction among the participants was synergistic and spontaneous.

The degree of emotional engagement, as evidenced by the students' body language, animation, and frequent "chiming in" to agree was impressive, especially when it is noted that these are students discussing subjects that traditionally move librarians only. All students responded that they used the site. Several responded that they "love it." Nearly all agreed it was the first place they went when they started a research project. All students responded that they used it when they were not at school. Many noted that it was bookmarked on their home computers. Some said they had made it the homepage on their home computer. All were enthusiastic about the guidance offered by the Virtual Library over the course of their high school years. All noted that they relied on it heavily for school projects, most recently their Senior Seminar, English, and Global Studies classes. They understood that the site was designed for them, that specific pages were created and maintained to meet the needs of specific Springfield assignments and specific Springfield teachers. Students understood the structure of the site. They knew the categories and why each was useful. Some commented that they liked the little pictures and found the site "pretty."

Students spoke predominantly of their school research needs, queries inspired or imposed by their assignments and their teachers, although a few also described searches relating to personal information needs—for instance, the search for college information or for suggestions for books to read for leisure reading either from the Web-based OPAC or the linked reading lists.
Results: General Focus Group Observations

The most common reasons students listed for accessing the site were to use the subscription databases, to check documentation styles, to find quality resources and primary sources, and to use curricular tools developed by collaboratively by their teachers and the librarian.

In each of the four groups, the favorite or most used area of the site was Catalogs and Databases, where students had access to subscription databases, the OPAC, and the catalogs of other libraries for interlibrary loan. Students described their favorite databases as if they were *fans*, as they might describe their favorite actors or musicians. "I love GaleNet." "I am obsessed with ABC-CLIO." When students suggested site improvements, their improvements focused heavily on improving their access to databases.

Students appeared to have understanding that Google was a wonderful search engine, but that it was not the best strategy for beginning academic research tasks. In fact, it made their academic research harder to manage. They relied on the school library website as a quality filter.

Students described their thoughtfulness in selecting quality information. They used the word *scholarly* 13 times. The website is part of the larger story and is difficult to separate from a school culture that values high quality resources and is dependent on the site to guide students to quality.
Second to Catalogs and Databases area in student preference in all four groups was the MLA Style Sheet and assistance with documentation. Students universally noted appreciation that the sources they were looking for were used as examples. They clearly appreciated customized documentation advice available whenever they needed it. Many expressed enthusiasm for NoodleBib, a citation generator added to the site late last school year. Students noted that their teachers were serious about documentation. Their grades were related to their ability to document accurately. The format listed on the website was the format their teachers required.

Students were eager to compare their experiences to those of their peers who do not have access to library websites. They displayed serious pride about their abilities and their knowledge of their Web options compared to their friends' in other schools.

Student responses are listed verbatim to illustrate the ranges and richness of responses. Grammar has not been corrected. Group numbers are included to illustrate the significant resonance of the responses across student ability levels.
"It'd be really dumb not to use it. Everything there's laid out for you." Reasons for Use

Students offered several reasons why they use the library site. Recurring concepts include the idea that the site is customized to their needs, that it makes research expedient, that the site functions as a quality filter, and that their teachers trust and recommend its resources.

In all the groups, students noted that they used the site "whenever we have projects to do." Interestingly, only two students discussed searching for information when the search task was not imposed. They described personal searches for college information facilitated by the College and Career Pathfinder. In a school where research is regularly assigned, students themselves limited the conversation to information needs that addressed school research.

Among the academic reasons listed for use were:

> A: If you need help with citing, you go and it has everything basically that you'll ever need.
> A: Primary sources are a big one that it's really hard to find if not using the website, so we also go to that. (Group 1)
> A: I'm trying to find like literary criticism or scholarly articles, I always go there first. But sometimes I'll type the Google search in first to give me like a general idea of what I should be looking for, and then I'll go there. But I pretty much always use it.
> A: I love the pathfinders. I make good use of them. Extremely specific. You just go "doot" and then you're there. (Group 2)
> A: It's usually the first place I go to primary search anything.
> A: When you research at the Virtual Library, you know that you're getting like correct information and stuff. (Group 3)
> A: When I do a research paper, like a lot of MLA styles to make sure I'm doing the citations right. Databases too, like you want some scholarly articles you can go on, bigchalk like one of those big databases that can really be helpful. (Group 4)

Many students felt the site offered them expedience in the research process:

> A: It makes it a lot quicker to do research, where as otherwise you'd have to go through like pages and pages of useless stuff, but it's a lot quicker and it's a lot more consistent. (Group 1)
> A: And it also makes the research process less time-consuming, so if you have a project you're going to go to that because it's easy to use and it's fast, and it gets you right to where you need to be. (Group 2)

Students understand that site is dynamic—that this page and other is responsive to new resources.

> A: I use it every year. You see it changes every year. And it keeps it updated so I know it's still there, reliable resources.

"They say you need scholarly things." Influence of Teachers in Encouraging Site Use Students noted that they used the site because their teachers recommend it. They notice their teachers' roles in developing the online lessons, handouts, and pathfinders. Students perceive that the site allowed them to meet their teachers' requirements for using scholarly sources. In fact, the word *scholarly* came up during each of the discussions, a total of 13 times, spread out equally across the honors and regular academic classes.

> A: The teachers, you know, when they say you need scholarly things. (Group 1)
> A: And also teachers lead us towards the website for different classes. They have like their own little section set up so I use it then. (Group 2)
> A: "Yeah, many of them just place emphasis on using the website for primary sources, and literary reviews, so in English and history, the more social type classes use it quite often. And also for like biology because you have like databases and pathfinders that you can use. (Group 2)
> A: I like it because they give you scholarly articles and most teachers require that, so it's a good place to start. (Group 3)
> A: And a lot of the teachers will have a place on the library's web site where you can go to find assignments if you've missed any, which is another useful amenity. (Group 4)

Some students said that their teachers recommended it, but they would use the site even it that were not the case.

> A: I find myself going to it not just because the teachers wanted us to but because it was a good resource.
> A: Well, over the years I've found it useful.
> A: Yeah.
> A: Yeah.
> A: It's never like a last resort, because it'll be easier just to go straight there and see if it has it, because it usually does, and then do Google. (Group 2)

When do students use the site? Students clearly use the site at home, in the evenings, and on the weekends. In each group students noted that the site was either bookmarked at home or was their homepage on their home computer.

> A: If I have a project, I'll use it at home to work on the projects. So I do use it at night and on the weekends sometimes.
> A: Basically whenever I have to research for a project, I use it, whether that's at home and on the weekends or at school, it'll be the first stop. (Group 2)
> A: And it's easier to use than, like if I'm at home I can use it instead of just having to go to the (public) library and hoping that the library has what I need, and sometimes it doesn't, so...
> JV: So do you guys use it at home, evenings, weekends?
> All: Yes.
> JV: You all use it at home.
> All: Yes.
> JV: Is it bookmarked?
> All: Yes. (Group 3)
> JV: Is it usually the first place you go or the last resort, or somewhere in between?
> A: Usually the first place.
> A: Yeah, the first.
> A: Yeah.
> A: It's my home page at home, so it's the first place I go. (Laughter) (Group 4)

"There's a database for everything." Virtual Library as Quality Filter

Students spoke often about the importance of discerning quality information, the importance of being able to locate primary and scholarly sources. They valued pathfinders as a way to quickly get to resources for specific assignments and to quickly access particular information formats. But perhaps the biggest revelation from the groups was the enormous appreciation students felt for access to online databases. Student voices gushed as they easily listed and described their favorites. GaleNet, especially its Opposing Viewpoints database, was universally acclaimed. A kind of "me too" syndrome emerged in each group as they discussed their most-loved databases. Though students had their favorites, they recognized that they each had particular strengths and choosing the right one for a particular information task was important. Some displayed surprising understanding of which database was provided by which vendor. (In a perfect virtual library world, that concept would be transparent to the user.)

> A: I like e-library.
> A: Me too.
> A: I like GaleNet.
> A: I *love* GaleNet.
> A: I *love* EBSCOhost.
> JV: Why do you like the databases?
> A: Because they really give you good essays and good material. Like you're not getting little flimsy thingies from Google, you're getting good solid essays about.
> JV: So databases seem to be like the primary value.
> All: Yes. (Heads nodding in agreement) (Group 1)
> JV: What features of the library website do you value the most?
> A: Catalogs and Databases. (Yes, all, laughter)
> JV: It seems like that's a value for everyone?

All: Yeah. (All responding at the same time) GaleNet—yes, GaleNet! EBCOhost, I like e-library. e-library is the best for Global.
JV: It's interesting to see that it is such consensus over the databases. Why is that, do you think?
A: Cause they have everything. It links you to the whole world.
A: There's a database for everything. Like if you need newspaper articles, there's one for that. If you need like scholarly sources, there's one for that too. If you need like pictures or reviews, there's stuff for them too. (Group 2)
A: I use it when – actually, I'm a dork. I use it when I don't know anything about that particular issue just to read up on it, or also if we have debates like the UN model that we did in one of our classes, I wanted to know a lot about my position that I was given, so I used Opposing Viewpoints and Research Gold (Student Resource Center Gold) which actually really helped me to get in-depth what I needed to learn.
A: I like how there's like a myriad of different databases in there, because if I'm in GaleNet's Opposing Viewpoints and I type in my topic and I only get three articles, I go search at e-Library and I find 20 articles. (Group 3)
JV: What features of the site do you find most valuable?
A: Databases. (All)
JV: Are databases number one for pretty much everybody?
A: Yeah. That or the MLA site.
A: You need the databases to get research, and then you're going to have to cite them.
JV: As to databases, which one's the most helpful?
A: GaleNet.
A: Opposing Viewpoints.
A: That's GaleNet, though.
A: BigChalk's pretty good. SIRS too. EBSCOhost is good too. (Group 4)

Why the universal acclaim for databases? They give students efficient access to the materials their teachers value and those they have come to value themselves. Students noted that databases offered greater searching flexibility and more options than free Web search tools. They knew that databases offered opportunities to filter for peer-reviewed materials and to search by media or document type.

A: And also because you can be really clear about what you're searching for, and you can say like peer-reviewed or only magazines or only video pictures, primary sources. Just the options make it valuable. (Group 1)

And students appreciate the portability of their database options.

JV: So you appreciate search options in databases.
All: Yes.
A: A lot. And I also use them at home too since we have the passwords. And I usually go back and research further at home on the databases on my own computer. (Group1)

Students explained that their strategies for evaluation extend to examining database result lists. In Group 3, one young man a selection process that moves well beyond *satisficing*. He described the importance of the critical evaluation of results even when they appear in already filtered databases.

A: The other thing is the ability to differentiate. I mean, yes, you have something like GaleNet and Opposing Viewpoints. But even Opposing Viewpoints might have articles that don't hold up to par as some others might, and you learn to look at those with a critical eye, learn to differentiate between good articles. I mean, it's not like looking at Google and GaleNet. You're looking at something that's very good and then deciding between great and better. (Group 3)
"I really don't have to Google things anymore, to aimlessly research." Comparing Google to the Databases and Virtual Library Resources

Many researchers have described convincing students to look beyond the free Web as an uphill battle. The popular literature refers to the worldwide phenomenon of "googlization." For the students in these focus groups, there are times to use Google, and there are clearly times when Google does not quickly get

them what they need. A student in Group 1 expressed an understanding of Google's limits, noting, "Apparently there's an invisible Web that I didn't even know about."

When searching options are no more than an extra click away, and when use of those options are highly valued by their teachers, the slope to develop a richer searching tool kit does not seem as steep. Without prompting, nearly all the students were eager to compare their experiences with the world's most popular search engine to their experiences with the Virtual Library for academic research. Students compared their lack of success with Google to their positive experiences with the website 23 times.

While students continue to use Google's significant information reach for other information tasks, their academic behaviors and attitudes fly in the face of the Pew findings relating to college students who ignore their university's resources. The Pew researchers observed "students who were using the computer lab to do academic-related work made use of commercial search engines rather than university and library Web sites" (Jones and Madden, 2002). Each focus group repeatedly expressed the belief that their school library's customized interface was better able to give them what they needed, as well as what their teachers hoped they would find. Google didn't *cut it* for their school projects. It wasn't efficient for their information needs; it didn't filter for quality. It didn't have the type of search features they found in their favorite databases.

> A: When you research at the Virtual Library, you know that you're getting like correct information and stuff. Like going to Google and getting someone's like crap. Or a student project. (Group 3)
> A: If you end up going to Google, you have all sorts, you have all this huge pile to sift through, but the library's already sifted through all of those. (Group 4)

Students often compared Google to subscription databases. Though Google may have quality materials, students generally felt it would be more expedient to use databases. (Interestingly, these same students are linked on the Virtual Library to Google Scholar, Google Print, and Google's Advanced search screens. In the short answer items of the Web-based survey, students noted appreciation for being introduced to these extended Google tools.) The focus group students appear to understand the difference between general free Web search tools and databases.

> A: Google doesn't really come up with...
> A: Scholarly articles. That's how the Virtual Library helps us out. (Group 1)
> A: I think I understand more about like general Google searches versus the databases, like how they're separate and how they each kind of do different things for you. (Group 2)
> A: To me a good researcher is someone who doesn't try to find the easiest way out. I mean, it can take you, yeah, ten seconds, whereas ten minutes you can find twice amount of articles, journals, scholarly articles than you could have found on Google or Jeeves. I mean, they're search engines, and that's what they're specified for, search engines. They're not in-depth scholarly articles. You're not going to find Harvard Journal . . . and if you do, maybe Google's stepping up their game. (Group 3)
> A: I know that like before my boyfriend got into a different private school, the teachers don't even know what a database is. They are just like go on Google or something. . .And then I compare it to students at this school, and it's like this is real information, I see that it's from a scholarly article rather than like someone's website project or something. (Group 3)
> A: I think it's a waste to go on Google, because like five articles from Google equal one from GaleNet. (Group 3)

Group 4 noted that other school websites may have limited resources and they feature prominent links to Google. The group laughed and wondered why a library would bother to link students to create such a link.

> A: I went to sites from a different high school and they had like a website but it didn't have any databases, good ones, they had maybe like two, it was like Ask Jeeves and Google. [All laugh]
> A: A link to Google. (Laughter)
> JV: Why do you laugh when you hear that?
> A: Cause it's so...

A: It's like a joke to us.
A: Cause now we have all these resources.
A: All we go to Google is for pictures now.
A: When we started out to research, every time we'd go to the library to research, we hear, now don't just go to Google." And other schools are like, "Hey, go to Google."
A: In eighth grade they used to tell us all Google, and sites like Dogpile.
A: And how when I go to Google and I actually read stuff, I'm like, did a 12-year-old write this?
A: And they're just like weak. They're not real. (Group 4)

Students sensed that the sources found using databases would be preferred by their teachers. Although the search engine would not likely to be visible in the URL in a standard citation, the here student refers to the general quality of the choices:

A: Well, the other thing is when your teacher looks at your citations he or she is not going to see Google, Google, Google, Google, Google, Ask Jeeves. It's personally embarrassing for me to have that, so having something like New York University Medical Journal . . . that's a very good thing to have. And the teacher says okay, this person took time to do it. (Group 3)
"And I always know to like click on the desk if I want help." Instruction and Intervention

Students noted with laughter that the Virtual Library continually expresses the librarian's voice and reinforces face-to-face instruction. Students' appreciation of this type of online intervention echoes Kuhlthau's (1997, 2004) descriptions of students' affective response to school research and the importance of adult intervention at critical points in the process, as well as the growing potential for intervention online. Students view the website as a hybrid experience. Instruction they receive formally or informally from their teachers and librarian during school hours is continued after school or when they are in school but not in direct contact with faculty.

Students understand the email button is really their librarian and that she understands their information needs. Some students noted that they made use of email help.

A: I know I can click on the desk if I need help. (Group 1)

Librarians and their teachers are noted and might be worth visiting first. Formal lessons and over-the-shoulder instruction appear to resonate during students' independent use of the site.

A: I see like a lot of the databases and like how things are set up, it's like what you teach us to go to, and I can see how you're trying to get us to access those things that you tell us are useful for us.
A: And I think there's a lot of instructions on the page that kind of mimic your voice. It says I know when you come to like the classrooms telling us what to do, like if you look at the website, look at like what you have to do in the pathfinders or if you're going to a certain type of website, then like your voice is there because you're leading us towards it without you actually being there. (Group 2)
A: It's there. Yes.
JV: In what way do you hear my voice when you're at home?
A: When you research, you're like, when you're typing in the key words...
A: To rephrase it.
A: Yeah, to rephrase it if you don't...
A: To not just give up, not just give up if you don't get a match right away.
A: Keep doing all kinds of...
A: And to use different databases.
All: Yeah. (Group 4)

Although students in Group 1 didn't recognize they were using what the librarian called "Pathfinders," they later described these customized instructional tools as very useful. One young woman in Group 2, raved about their ease of use for specific projects,

A: "You just go 'doot' and there you are." (Group 2)
A: I think that's the main thing for me. And they give you so many options to choose from. It's like a win-win situation that you don't really lose from it. (Group 4)
"And it's pretty, so you don't think about having to do research." Schema and Organization as Implicit Instruction

The organization of the Virtual Library is designed to be implicitly instructional, with search choices and other resources categorized around an image map, guiding students to both Web and school-specific resources. Students felt that the scaffolding of choices reduced their cognitive load and made research more enjoyable.

A: I think it's cute. It's like a graphic organizer with pictures you can find. And it's pretty, so you don't think about having to do research. So it makes it easier. It makes it happier.
JV: In terms of the organization, does it help you?
All: Yes. (Group 1)

A number of instructional tools were developed for and are archived in this central location in order to facilitate access and reinforce instruction. Students understand that many teachers had favorite places on the site and places they themselves helped to develop—that their teachers' voices, as well as their librarian's, are present. For instance, as a school devoted to inquiry, the faculty offers supports to help students develop thesis statements.

A: We definitely use the thesis test just about every time. That's helpful just because you have the five questions to check yourself with.
A: I know in Senior Sem our teacher printed out a few of the resources I haven't seen. Some are on like more than just the thesis generator. There was one that was like different ways to word your thesis. You can use like comparisons, or like most people think this but in truth it's this. And I actually hadn't seen those before so it was really helpful.
A:There is like a list of good introductory phrases that help in generating a thesis. (Group 1)
"Every citation on every paper." Documentation Help and Information Ethics

Second to databases, students noted the most useful feature of the Virtual Library was its guidance in documentation. Students appreciated the customization of the examples.

JV: After databases, what do you like?
A: Citations.
A: Noodletools and the MLA style sheet. (All shaking heads)
A: They have the like style sheet. I use it for *every* paper. (Group 1)
JV: What other features do you use?
All: Definitely. The style guide. Yeah! (Shaking heads, enthusiasm) (Group 3)
A: The other thing is every time a teacher says you have this paper to do, oh and by the way, you have to do the MLA citations and works cited, so it's perfect to print it out and have it. (Group 3)
A: I would do it like at nights to make sure that I have good sources, I'll go over and recheck them on the web sites, and the MLA really helps you a lot, because there's a lot of different, there's a lot of different little stuff that you can miss if you don't look at it correctly, and it gives you an example, which is always good.
A: I would do good on papers and then fail works cited.
A: Even doing works cited since you were in middle school, but I still, every time I do works cited, I still need to glance at the home page just to make sure everything's right, just periods and everything like that. (Group 4)

This year students were offered a citation generator as well as the style guide. Though they were always linked to free citation generators, NoodleBib is full-featured and includes specific guidance for citing all the school's databases services.

A: I like the citation generator this year as well.
A: Yes.
A: Yes

A: I use that quite often, especially when I've done a paper and it's all done and I've done my research and everything, and it's like the day that it's due and I'm like, oh no, I didn't do my works cited, I have to run up to the library and do that, and I just use the generator.
JV: NoodleBib works pretty well for you?
All: Yeah. (Group 3)
A: NoodleBib's amazing.
A: I like it because all you have to do is like enter in the information.
A: It's basically a template of all the information that you want to, what you'd add in for a works cited, and it just does it for you. (Group 4)
"So are you talking about interlibrary loan? A: Yes, that's it." Interlibrary Loan

Though no one could actually name the service, several students raved about the statewide interlibrary loan system. In an age of immediacy, where alternate information is likely available via e-books, websites, and full-text databases, this particular move away from *satisficing* speaks to student willingness to plan and to wait a couple of days, or even a couple of weeks, to get preferable information sources. It also speaks to student willingness to use print. Through the discussions, students revealed their understandings that libraries are networked environments and that university and public libraries generally have collections different from, and often larger than, school library collections. The researcher attributes this willingness and these understandings to instruction in interlibrary loan use for major projects, the efficiency of the statewide catalog system, Access PA, the accessibility of local online university OPACs, and the ease of access to these services from the Catalogs and Database page.

A: I was looking for information about films that weren't just reviews of films, and I found a lot of stuff through the library website that were actually through other universities and things like that.
JV: Are you talking about interlibrary loan, the university catalogs?
A: That too, but also using other schools' catalogs and things that we might not have here but we have connections to get to them, so that was very helpful. (Group 1)
A: And like my senior project, I got to order those books from other libraries, the local libraries don't have them, and that really helped, especially when you don't really have access to things that you need for your projects. (Group 2)
A: Also the Pennsylvania – my personal favorite is, next to GaleNet and e-Library, next is the Pennsylvania exchanges.
JV: Do you mean interlibrary loan?
A: Yeah, interlibrary loan, and you get it within two days, it's perfect, especially when you're on a deadline. It's the best. (Group 3)
A: Via PA Electronic Library or whatever, where all the libraries in PA are connected, so if our library doesn't have a big, it'll tell you where you can get it.
JV: So are you talking about interlibrary loan?
A: Yes, that's it. (Group 4)
"Much better. So much better. We have a lot of advanced programs here." Compared to Other Schools

Students spoke of their research skills with confidence and were eager to compare their experiences to those of their friends in schools without the guidance of virtual libraries. In fact, this comparison sparked animated conversation and agreement in all four groups. Students noted that other high schools do not focus on student research. Teachers in other schools may not know what a database is. The students expressed gratitude for the resources they had been able to access and clearly realized that not all their peers had access to online guidance, customized curricular resources, and easy access to databases to support their academic projects. These students regularly guide students in other schools--high school students as well as students in higher education--to the Springfield Township site.

One senior who transferred to Springfield as a sophomore, made this comparison to her former school which had a limited website.

A: Not many libraries have set up what we have because other schools websites that I went to. And they might give you links to stuff that's going on in the library, but not Catalogs and Databases that we have available to us. They have like this online website and I wish in previous

> years back like I had access to it and knew about it, because it makes things so much easier with researching. (Group 1)

Another student noted that the site was important because it matched the strong research focus of the school. She suggested that students in other schools, with lower expectations for research, may not have the need for an extensive site.

> A: I know that I talk to a friend who goes to a Catholic school, a couple of schools, and they said that they really didn't write long papers, they usually write five-paragraph expository essays and that they only wrote a couple long papers in their high school career, and I feel like we are a lot more research-driven in that we write a lot more longer papers with scholarly articles cited, so I feel that we've been research-driven pretty much, and the website has helped with that. (Group 2)

Students spoke with evident pride of helping friends whose school libraries did not maintain extensive sites.

> A: And I know that friends, some of my friends from other schools, they always ask me where did you go to find the research for the information, or ask me to help them with their research because I know I can just go to the school website and then it'll be just that simple. (Group 2)

Students in Group 3 compared their experiences to their friends', admitting that they "illegally" shared their licensed database passwords. They were proud to be able to display their abilities to efficiently access quality material for school research.

> JV: Can you compare your research experience with those of your friends in other schools?
> A: Better.
> A: Much better. So much better.
> A: A lot better. (Nods, agreement)
> A: My friend was doing a senior project the same time I was, and she was like I need some more sources, like I can't find anything on Google or Yahoo or anywhere else she was searching. So I had to give her like my list of passwords and like the sites that I use. I was like, oh, don't give this to anybody else. She's like thanks so much. And I like did some research for her because I had the access to it. It only took me like five minutes to find just like a packet of stuff just to give to her, and she's like this is more than what I've gotten by myself in like a month.
> A: Yeah, I do the same thing. Like if my friends are in trouble and I'm just like, oh, here, let me show you a place to go, and I pull up GaleNet, and I pull up Opposing Viewpoints, and they're like oh my gosh, thank you so much, this is exactly what I need. But my school doesn't have this. (Group 3)

The comment and the general feeling, "We have a lot of advanced programs here," is a little surprising. Strangely the students compared their *privileged* experiences to students whose schools had, at very least, access to the statewide Access PA POWER Library databases, an extensive collection which includes the EBSCOhost suite of databases. These databases are available free to most students in the state through either their schools or public libraries. Springfield Township students perceive that they are uniquely gifted with many of these free databases through the Virtual Library. They believe that their friends' access to these resources is limited, possibly because of limited awareness of the site through which the resources are available.

A: I know we just have a lot of advanced programs here. Especially online, but also if I talk to people that go to (the local community college), they struggle with writing papers that we could have written in like eighth grade.

> A: I don't know if other schools really have everything that we have.
> A: Yeah, my friend from (a local high school) couldn't even write like a paper and have all the resources like us. It was like a joke paper to us.
> A: I went to sites from a different high school, and I felt I really didn't have, they had like a web sitebut it didn't have any databases, good ones, they had maybe like two, it was like Ask Jeeves and Google. [all laugh] (Group 4)

"I plan to use it next year." College Research Readiness

Nearly all students spoke of their attachment to the site. And although they all expressed their feeling that the site helped them prepare for college research, some expressed concern about moving on to new and larger interfaces. "I think I am still confused. I am sheltered within the system," said one young woman in Group 2. "I don't know what I would do in researching without it." This particular young woman's comments were both reassuring and distressing. She spoke to the comfort level students felt with the interface, as well as a certain lack of confidence for moving on. She was not alone. Several students expressed the fear that their college might not have a website that would be as easy to use. After the student expressed that thought, others responded that they suspected university library sites had similar structures and they would likely to be able to transfer concepts and understandings to the more academic environment.

Though most students expressed their readiness for college and academic research, each group noted they would likely return to the high school site. Several students noted that older siblings, because they are so comfortable with the interface, continue to visit as alumni. They grow especially reliant of databases that proved successful to them in their high school years. Though the sharing of database password violates the school license, students are obviously using these passwords well beyond their high school tenure.

For these students, the site seemed almost like the neighborhood candy or convenience store. They know where the candy bars are and they know the shopkeeper behind the counter. The word "pretty," used by a young woman in Group 1, is likely used to refer to the image map which has served as a consistent schema, or mental map, for students over the years.

> A: I plan to use it next year.
> A: Yeah.
> A: We'll be coming back. (All)
> A: Everyone who's graduated says that they get a password sheet and use it so you can use it in college. I know my sister asked me for a password to use it for a student in college, and it makes me nervous, I'm afraid I'm going to go to college and they're not going to have like all this stuff to use.
> JV: It's funny, because they will have really much bigger databases there.
> A: They might not be pretty. (Group 1)
>
> Another student reassured his group that they should be able to transfer their knowledge of the types of resources available to the university interface.
>
> A: I think that it will help us in college with our university web pages, because I know that there's other institutions that have web pages set up like ours, so I think it helps us navigate in those sorts of databases. (Group 2)

A young man echoed the feeling of comfort, predicted a similar desire to return, and expressed understanding that the university site would lead to even richer options.

> A: At first, when I go to college I'll probably still want to come back and use these databases. There's liable to be a whole ton more there, but I know how to use these. I mean, they've been effective. When I need more, I'll go find more, but so far, most stuff I've gotten here in high school has been amazing. (Group 3)

A young woman described her experiences using the site to help her brother, a Springfield graduate who is currently an engineering student. Though his college library likely had more extensive resources, he felt more comfortable using the familiar environment of the high school site. His younger sister spoke with obvious pride of her ability to help him.

> A: Like just over this weekend, my brother called me. He graduated three years ago. And he called me to get the list of passwords to our databases. He's like (sister's name), I really need this, I have a project. And I was like, why can't you use the information that your teachers gave you? He's like cause I know that the information on this virtual library will give me the correct things that I need. He said I need EBSCOhost but I don't have the password, and that's what my teachers asked for. I was like I have stuff here as a high school student that college students need,

> and I think that prepares me well for college because now I know where I have to go, what I need, and I already know this stuff before I even get there.
> A: Mm-hmm. (All) (Group 3)

While each group responded that they felt the website "definitely" helped them prepare for next year's college research, Group 4 was emphatic, and felt that they understood the need for quality, expressed confidence in their abilities, as well as concern about losing access to their familiar databases.

> JV: Do you feel that the school library website helped prepare you for doing college or real-life research?
> Several: Yeah.
> A: Definitely.
> A: Because you know that there's going to always be a better research thing out there. You can always get better information if you're not satisfied with what you do have. Like in college it's not going to be laid out for us like this, but at least we know now—
> A: We can keep the passwords.
> A: Yes. I'm definitely keeping them.
> A: Can we get a printout?
> A: You don't change the passwords every year, do you?
> JV: In other words, you feel prepared.
> A: Yes, definitely. (Group 4)

These discussions about college readiness point to the need for potential lessons introducing university interfaces to college seniors, so that students might transfer their understandings of categories of resources available to a larger interface. If students saw familiar, if extended, resources on these larger sites, the transition might be far less intimidating.

Improvements

Students thought seriously about potential site improvements and appeared quite honest about their ideas, despite any perceived investment of the researcher/librarian. Five major themes emerged as students described strategies for improvement of the site.

"Big list of links" The Need to Weed and Annotate!

For some students dead links were a problem. While the Virtual Library has been gradually evolving from a focus on lists of links to annotated Pathfinders, old pages remain to frustrate student users. Students noted that they read and rely on annotations as clues to relevance and they would like to see more of them.

> A: For some of the links, I know I've come up to pages where it's just like a big list of links, and it would be kind of be helpful I think if there was like just a little star or something that just describes what the site is or what it has, because some of them are broken and some of them aren't what you were looking for or whatever. (Group 1)
> A: For me, I think on some of the less-used links, like the links to quotes, links to books. Some of them are broken, and have been for a lot of years. But not being able to use those, that's not really a big deal. (Group 1)

"There should be a topic list for the databases." Describe and Organize the Databases!

In each group students wanted more information upfront describing the databases. They knew they had many choices, but were not always sure where to begin. Students felt they missed some of the good stuff because they had trouble identifying the best database for a particular task. Though individual databases, like Gale's Biography Resource Center and EBSCOhost's Business Source Premier are separately identified in the Pathfinders as students work on individual projects, the databases are arranged by vendor in the Catalogs and Database area. This organization is meaningless to the student user. Several students requested that we organize the individual databases by subject, or perhaps create topical pull-down lists of databases for various information needs or for commonly researched questions. Following the focus

group discussions, the librarian responded by adding mouse-over descriptions for many of the databases and plans to create pull-down links organizing databases by subject.

> A: There's should be like a topic list for the databases, so that way like common questions that kids ask while they're on there, they could just have a list of databases that apply to each topic.
> A: If there was a description of like the databases underneath or somewhere near so you could find it, to help you like direct to where you should actually be looking for a topic. 'Cause a lot of times I would be looking in different databases and I'd ask somebody, the librarian would say no, you should be looking here or here. If there was a description underneath the databases, that would help. (Group 3)

"I don't have those sheets." The Problem with Passwords

Each of the groups noted frustration with the experience of losing the database passwords when they need to work at home. They wanted to see better strategies than lists of dozens of passwords, different for each database. These issues seem worth investigating and are not unique to Springfield Township. Many universities allow students to login to all their online resources with the same student number and password that they use for many other academic and campus life purposes. K12 vendors do not seem to be promoting similar strategies. As a result of the focus group discussions, the librarian plans to negotiate with the vendors for more uniformity in remote passwords.

> A: Sometimes when I want to access it from home I don't have those sheets to use it or something, and maybe they could put them on the website instead.
> A: It might be good to have like a website that has all the different passwords but have only like one password that you need to access that website so that you don't have to remember as many passwords at a time, and you can just access that if you need it. (Group 2)
> A: I think something that would be really cool would be like, you know how there's like that password sheet that you said is also in the background somewhere, I think it would be helpful if you could log in as if you were, like kind of like remote accessing something, you could log in as your first – or your last name, first initial and your password that you use at school, and then so that at home you could just click on all the different databases and not have to put in the new codes. (Group 3)

"Because I pick the wrong words. . ."Trouble Naming the Need

In each group students discussed their difficulty in expressing searches. This is consistent with much of the research describing issues with expressing information needs as well as the many researchers who suggest the importance of thesaurus help as students search. It is impressive that these students actually see their issue as an issue relating to their own limitations. They recognize that poor searches get them fewer results or results of lesser quality. To a small degree, this issue may be addressed in Pathfinders for individual projects, but would it be far more effectively addressed if search tools more seriously considered the vocabulary limitations of children and young adults. Working independently, students need the support of thesauri and systems that make alternative descriptors and related words and phrases more evident.

> A: I found even I'm using a database, sometimes I don't know exactly what to search under, and I try a bunch of things. Sometimes it helps, sometimes it doesn't. But if I had like a more direct purpose in my search terms, it would save a lot of extra searching that I have to do.
> JV: You're talking about developing key words?
> A: Yeah. (Group shaking heads.) (Group 1)
> A: I remember having to do an exposé on Chinese prisons and I kept writing China prisons, and it wouldn't give me anything, it kept saying specify, specify, and that's really hard to do because you don't know how more specific to make it. So you put it in quotations, you do italics, you don't know. (Group 3)
> A: That would be cool if they had some feature where you could type in what you want to search for, but it comes up as like 20 different ways to say it, because I pick the wrong words and then—
> A: Cause it matters how you word stuff, how much information you get. (Group 4)

"The more we can get similar to that, the better." More Databases, Please!

Despite the fact the library website displays a wide variety of database options, Springfield students know that university budgets provide for a far greater array of resources. They expressed their desire for even more resources.

> A: Well, I've seen like some of those university websites and they just have so many databases on there, and I guess a lot of that is a money issue, but GaleNet and e-Library, like we find there are like some databases that are just really good, and the more that we can get similar to that, the better. (Group 2)

Results from the Web-based Survey

As part of the larger study of 17 schools, Springfield Township High School seniors participated in a Web-based survey prior to the focus group discussions. The open-ended responses of 56 Springfield Township seniors (42.4% of the class) who participated in a survey help to validate the data expressed in the focus groups. Though overlap exists--the 26 focus group participants were among the 56 responders--the Web-based survey includes 30 additional students from other visiting classes. Web survey participation was more anonymous. No librarian observed. No camera intruded. Students who might have easily opted to answer only the "less energetic," quantitative items, clearly spent time composing responses in three concluding qualitative questions. All but one student wrote several sentences of responses to the following items:

- Can you describe a successful experience you have had using the school library website?
- What additional features or improvements would you like to see the librarian(s) make to the site?
- In your own words please describe the influence the school library website has had on your high school studies.

Student responses to the Web survey closely echo the responses of the focus group participants. Common themes for the "successful experience" item included the students' appreciation of access to databases, citation advice, and easy access to interlibrary loan. Students used the word *scholarly* nine times.

Again they compared the use of the site to their experiences with Google:

- It showed me different alternatives in researching other than going straight to Google.
- I have learned how to decide if a site is credible or not, and I have learned how to find more information and better ways to finding it rather than Googling everything.
- They noted their appreciation for access to databases and an understanding that they have both free and invisible Web options.
- The databases are essential to most school projects and provide a lot of quality material that can't really be found on the free Web.
- I have recently finished a paper and project about Africa and the majority of my resources for the paper came from links on the school library website, such as SIRS, EBSCO, and GaleNet sources.

Next to the databases, students commented that they appreciated advice in documenting their sources:

- Recently, I had to use the MLA style citation guide for a annotated bibliography for my English class. Many of the sources I used, I had never really used before, and this site was helpful in demonstrating the proper way to cite them.

They expressed satisfaction with online library services and connected its use to their academic achievement:

- I have used the library website for every major project at school. In my junior year, I did my end-of-the-year project worth 170 points using only the library resources and I got an A on my presentation which was graded by the one of the teachers that is an extremely hard grader.

- I have used the school library website for almost every project I have done in High School. . .This website has saved my life many times during school and I couldn't have done as well as I did in High School without it.
- I used the website for help in all major papers when it came to research and citations so that I was not to plagiarize. I relied most in my high school career on the Library web page for help in researching my senior thesis paper and project. It has been a great help and I may have been lost with out the guidance of the web page.

Though more than half of the students said the site was just fine as is, the Web responses relating to suggestions for improvements also echoed those of the focus group participants. Students requested even more databases, online password lists for easier access to databases at home, and more annotations for the links. They wanted the dead links fixed. And they wanted more support for searching vocabulary.

- Sometimes I forget to take the sheets that the library provides for passwords to use when accessing the website features at home. Then I have no way to access the things I need.
- While I often have the search engines and databases I need to search with, the search terms I am using often don't come back with the results I am looking for.

One student apologetically suggested that the site should go beyond research needs and focus on students' leisure interests:

- Maybe there could just be a site to link up to popular interest sites so that it does not overwhelm students and so that the web page is not used strictly for work. If I missed a link that sends students to sites for leisure, I am sorry, just an idea.

Student response to the item on the influence of the site on their high school career overlapped themes covered in the item on successful experiences. Among the typical response were:

- The library website has broadened not only my knowledge in all research topics, but has also helped me to better understand where to find the best information on the internet.
- It has completely changed the way I research for a project. I no longer Google everything. I am better able to find information, and I am able to find the information more quickly.
- It easily guides the student through the research process, allowing them the luxury to focus on the content, style, grammar, and mechanics of the project itself. It truly makes the research process less arduous and time-consuming.
- Every paper or research assignment that I have had throughout my high school career, I have used this site for just about all of my research. I show it to all of my other friends that don't have a virtual library and they love it. I couldn't live without it.

Conclusions

The focus groups sessions clearly demonstrated that these four groups of students valued the library website and relied upon it heavily. These are not novice users. These students display sophistication in their information seeking and appear to have learned from the site over their five-year high school experience. What was especially surprising was the degree of consensus, both within and across the four groups. Students were well aware that their information choices extended far beyond the result lists of commercial search engines. These students consistently move beyond *satisficing*. They voluntarily and energetically seek out the non-immediate and non-electronic, as demonstrated in their interest in interlibrary loan. They are serious about evaluation. While current studies note that the general public relies heavily, often exclusively on Google, students in the focus groups noted that they avoided Google for their academic assignments and relied on the other search tools, including databases they discovered on the library website and the multiple sources types they discovered in customized pathfinders. They universally appreciate access to databases and recognize even within databases there is good information and great information. These students understand the need to use information ethically and demonstrate pride as they discuss the care they take in documenting sources with the guidance of resources available on the interface.

Students in each group appeared eager to share successes with the interface. They believe that over the course of their studies, the website not only guided them to useful resources, it guided them to better grades. The site helped them meet their teachers' expectations.

Feedback from the groups spotlighted problems students faced in deciding which databases to use for particular tasks and how to develop a good query. The discussion confirms the need for both instruction and for database and website support for students looking for keywords as they search. It also confirmed the need for improving website annotations and for a more user-centered access plan for remote database users.

Clearly, it is not the website alone that is inspiring the serious research behaviors. Use of the site for these students is a hybrid experience. Springfield Township teachers are users and advocates of the site as well as contributors to the site. Students note that they hear the actual voice of the librarian, as they interact online. That voice reinforces advice they hear when they are in the physical library.

While the results of these focus groups cannot be generalized, these students are likely representative of students in their classes and they provide encouraging feedback and thoughtful suggestions for improvement of online service and instruction and suggest the possibilities that students can be influenced by virtual libraries to move beyond novice use of information.

Clearly designers of school library websites cannot make assumptions that strategies that work in one culture will work in other school communities. The researcher is currently examining both qualitative and quantitative data from the larger study of 17 schools identified as best practice in school library websites to extend the study. A content analysis of the sites will compare the features and services presented and a Web-based survey of nearly 1400 high school seniors will create a large picture of impact of virtual library service. Will the data from the other schools resonate with the data from Springfield Township? To what degree does library online instruction and guidance influence the information-seeking habits of young adults? What role does school culture play in use and effectiveness of these sites?

Acknowledgements

The researcher thanks teachers Veronika Sweeny and Carol Rohrbach for allowing their students to participate in the focus groups and the students themselves for their honesty and their investment of time in helping to improve virtual library service to the students who follow them at Springfield.

Biography

Joyce Kasman Valenza is a doctoral student at the University of North Texas SLIS. Her research interests involve the information seeking behaviors of young adults, instruction in information fluency, and the value of such online instructional tools. She is the teacher-librarian at Springfield Township High School in Erdenheim, PA. She is the techlife@school columnist for the *Philadelphia Inquirer* and a regular contributor to *VOYA*, *Classroom Connect*, *School Library Journal*, and *Learning and Leading with Technology*. Her current research on school virtual libraries was awarded the AASL / Highsmith Research Grant.

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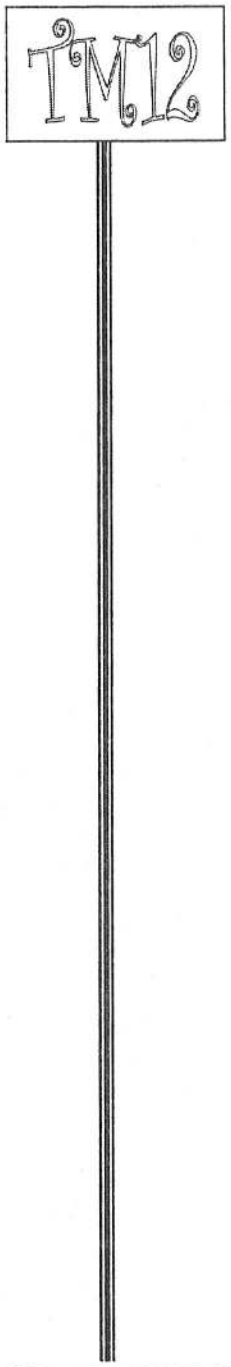
Appendix: Focus group questions

1. When do you use online school library services?
2. What prompts you to use the school Virtual Library?
3. Is it is usually the first place you go or your last resort?
4. Can you describe the last success you had with the interface?
5. What features of the school library website do you most value?
6. How have those features helped you with your research? Your understanding of the scope of online resources?
7. Does the librarian's influence appear to be present in the site?
8. What problems or flaws do you encounter with the interface?
9. What improvements or additional features students would like to see in the website?
10. Do you feel the school library website helped you prepare for college or real-life research?



Two Heads Are Better than One

Influencing Preservice Classroom Teachers' Understanding and Practice of Classroom-Library Collaboration

Preliminary Report on the Pilot Study

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Abstract

Two Heads Are Better than One: The Factors Influencing the Understanding and Practice of Classroom-Library Collaboration is a longitudinal, qualitative case study that proposes to identify the factors involved in educating future classroom teachers about collaboration for instruction with teacher-librarians. The study will monitor the growth of teacher education students' understandings of collaboration through their preservice education and first year of classroom teaching. Some study participants will be enrolled in a teacher preparation program facilitated by the researcher, a former teacher-librarian, and others will not. The goal of this study is to suggest critical components of preservice education and/or first-year teaching experiences, which can influence novice classroom teachers' future collaborations with teacher-librarians thereby creating opportunities for increased student achievement as well as improved teaching practices. This paper contains a description of the study, a foundational literature review, the survey instruments that will be used in the study, and the initial findings of the pilot study in progress.

Introduction

Today's K-12 students are required to achieve a higher level of literacy than their parents and grandparents. Students in developed countries live and will work in information-rich cultures that require sophisticated reading, writing, and thinking skills and strategies as well as the use of a constantly-changing array of technology tools. In the United States and other developed countries, the resources of school libraries have provided opportunities for engaging students in resource-based learning that develops literacy and stimulates higher-order thinking. In addition, libraries have often been the first room at a school site, outside of the computer lab, to be infused with technology tools. As a result, school libraries have provided students and teachers an environment conducive to exploring curriculum that goes beyond the textbook and invites learners to develop literacy skills as they consider the complexity of ideas and information. The educational imperative to design, implement and assess lessons and units of instruction that engage students in the processes of sophisticated literacy and critical thinking have never been timelier.

In 1998, the American Association of School Librarians (AASL) and the Association for Educational Communications and Technology (AECT) jointly authored *Information Power: Building Partnerships for Learning*, a revision of a 1988 edition. The 1998 text focuses the work of school library programs on nine information literacy standards for students and identifies three spheres of influence for teacher-librarians: literacy, technology, and collaboration (AASL & AECT, 1998). Although quantitative research studies in thirteen states have shown student achievement increases when full-time, certified teacher-librarians collaborate with classroom teachers (Library Research Service, 2005), the practice of classroom-library collaboration is not as wide spread as it could be. One of the barriers to this practice, suggested by Hartzell (2002), is that preservice classroom teacher education emphasizes individual interactions between teachers and students rather than collaboration among teams of educators who jointly design, deliver and assess curriculum. What would happen if a teacher preparation program emphasized collaboration?

The U. S. Department of Education predicts that 2.2 million teachers will be needed over the next decade (Howard, 2003). According to a recent study, "The crux of the teacher shortage problem is actually teacher attrition... it is hiring enough well prepared teachers who will remain in the classroom for extended periods of time" (Harrell, Leavell, van Tassel & McKee, 2004,

p. 38). If new teachers are inducted into the teaching profession with the understanding that classroom-library collaboration benefits students as well as their own teaching efficacy, they may build on their preservice preparation, experience collegial support, and remain in the classroom. These new teachers can create a demand for classroom-library collaboration in their schools' learning environments. It is the goal of this qualitative case study to determine what factors most influence a new teacher's understanding and practice of classroom-library collaboration.

It is paramount for the teacher-librarian community to identify strategies for influencing these receptive new colleagues. If we acknowledge that a teacher-librarian's ability to impact student learning is contingent on his or her ability to collaborate with classroom teacher colleagues, then this study may provide the profession with timely and useful data. Librarianship is a profession focused on service. To understand the needs and goals of library users, in this case novice classroom teachers, can help teacher-librarians better serve the instructional needs of their learning communities. While this study intends to recommend components of preservice teacher education, it also hopes to enlighten practicing teacher-librarians and the teacher-librarian educator community with regard to exemplary practices in school librarianship.

Research Questions

As this qualitative case study is intent on discovering interventions in preservice classroom teacher education that can result in novice classroom teachers' expectation for and practice of classroom-library collaboration, it is important to define the word "collaboration." Buzzeo describes classroom teacher and teacher-librarian collaboration as "two or more equal partners who set out to create a unit of study based on content standards in one or more content areas plus information literacy standards, a unit that is team-designed, team-taught and team-evaluated" (2002, p. 7). On each of the survey instruments used in this study this definition appears: "Collaboration occurs when educators co-design, co-plan, co-teach, and/or co-assess curriculum-based lessons or units of study" (Appendices A, B, C, & D). In a collaborative partnership, all the stakeholders are invested in the outcomes and share responsibility for students' learning. Collaboration is much more than cooperation. Collaboration acknowledges that working in teams has a greater potential to provide students with literature- and information-rich, interdisciplinary learning experiences. Rather than teaching as individuals who work in isolation, educators who collaborate engage in teaching and learning problem solving while they model teamwork, a critical 21st-century workplace behavior both inside and outside the education profession.

The research questions in this study evolve as the study participants matriculate through their teacher preparation program so each of the four surveys builds on the previous survey questions. The overarching question for this study is: What are the factors that influence preservice and first-year classroom teachers' understanding and practice of classroom-library collaboration? Each of the four surveys focus on the participants' developing knowledge and practice of collaboration:

1. What are preservice classroom teachers' prior experiences with school and college libraries? When they begin their teacher preparation program, what is their understanding of the roles of school librarians and their initial knowledge of and experience with classroom-library collaboration?

2. Which of the classroom-library collaboration-focused learning engagements and experiences during their preservice education influence preservice teachers' thinking about school library programs, the instructional role of teacher-librarians, and the benefits of classroom-library collaboration?

3. Which behaviors of teacher-librarians, preservice teachers' mentor teachers, and their own experiences influence education students' understanding and practice of classroom-library collaboration during their student teaching experience?

4. Which behaviors of the teacher-librarian, their classroom teacher colleagues and their own experiences influence novice teachers' understanding and practice of classroom-library collaboration during their first year of classroom teaching?

In addition to framing the online surveys (Appendices A, B, C, & D), these questions will guide the interview protocols as well. Participants who volunteer for individual or small group face-to-face interviews will be asked to elaborate on their survey responses in an open-ended question format. Through an exploration of these questions, this study, Two Heads Are Better than One, hopes to describe what should be taught to whom, and how should it be taught. Bruner (1999) suggests that education research can become "an adjunct to educational planning and design. It becomes design research in the sense that it explores possible ways educational objectives can be formulated and carried out in the light of cultural objectives and values in the broad" (p. 408). This research study, then, is designed to directly influence teaching practices both at the K-12 level and in higher education.

Review of Relevant Literature

Collaboration is a keyword in education today. The literature is replete with studies and articles related to collaboration and the importance of collaborative partnerships in preservice teacher education (Lenski & Black, 2004). The vast majority of these collaborative initiatives deal with the need for increased and more effective collaboration between universities and the K-12 schools in which future teachers conduct their practicum and student teaching experiences (Darling-Hammond & Bransford, 2005; Fullan, 1993; Moore, 2004). Another significant number of studies address collaboration among university faculty (Crowley & Méndez, 2004; Holmes Group, 1990; McBride, 2004) and between university faculty and preservice classroom teacher candidates (Darling-Hammond, 1996). Other studies focus on collaboration between preservice classroom teachers and K-12 students' families and communities (Flanigan, 2004; Kidd, Sánchez, & Thorp, 2004). While many studies describe collaboration between the student-teacher and mentor-teacher during the student teaching experience (Acheson & Gall, 2003; Beck & Kosnik, 2002; Graham, 1999; Phelan, McEwan, & Pateman, 1996), I have been unable to locate any studies that focus on the practice or efficacy of developing preservice classroom teachers' understanding of classroom-library collaboration.

Preservice teachers' beliefs about teaching are generally well formed before they enter the university (Pajares, 1992); they have been apprenticing for their profession since kindergarten. The "apprenticeship of observation," when K-12 students observed their own teachers teaching, often leads preservice classroom teachers to hold misconceptions about the craft of teaching (Lortie, 1975). These preconceptions affect what preservice teachers learn in their teacher preparation courses. "These preconceptions come from years and years of observing people who taught them and using this information to draw inferences about what good teaching looks like and what makes it work" (Hammerness, Darling-Hammond, & Bransford, 2005,
p. 367). One of the challenges of preservice education, then, is to prompt students to question their preconceived ideas about what is involved in effective teaching.

Learning in communities, or communities of practice, has long been associated with the teaching profession (Bruner, 1996; Lave and Wenger, 1991; Sergiovanni, 1994; Vygotsky, 1978). Preservice teachers will be expected to cooperate and/or collaborate with grade-level colleagues and other certified or licensed faculty, such as teacher-librarians, school counselors, speech and language pathologists, social workers, and psychologists, and families. Cochran-Smith (2004) identifies "opportunities to work with other educators in professional learning communities rather than in isolation" (p. 391) as one of the necessary conditions to retain high quality teachers in the profession. Future teachers can and should be

challenged to think in terms of teaching and learning within a community of adult learners who will support and propel each other's professional work.

Cook and Friend (1995) charge university faculty with the role of modeling collaboration during teacher-preparation programs. Observing collaborative teaching can support preservice teachers who may not aware of collaboration practiced by their own K-12 teachers, and would, therefore, find the idea of collaborating for instruction a new construct in their teaching framework. Coteachers Kluth and Straut (2003), a special education professor and a general education curriculum and instruction professor, are conducting a study related to the impact on the inclusion practices of preservice teachers who have observed and participated in the collaborative environment of their college classrooms. Unlike special education, however, information literacy practices are not part of the undergraduate teacher preparation curriculum, and in universities where librarianship is taught, school library courses are most often offered at the graduate level. This barrier results in the need for even more deliberate, planned and articulated integration of the part information literacy, multiple resources, and classroom-library collaboration can play in K-12 students' learning and teachers' teaching.

A review of the literature on technology-tools integration may illuminate a path for influencing preservice teachers' practice of classroom-library collaboration. Research has shown that when technology tools were integrated into the preservice program, new teachers integrated technology tools into their classroom teaching (Halpin, 1999). There may be an increased probability that preservice teachers who practice collaboration and/or classroom-library collaboration during their preparation programs will be more likely to integrate these practices into their future classroom teaching. The goal of engaging participants in these experiences is to prompt them to examine their prior construct of teaching as interactions between a single, isolated teacher and individual or groups of students. If study participants accommodate collaboration into their teaching construct, these preservice teachers may then enter the profession prepared and experienced in this method of instructional design and delivery.

Description of the Research Context

The participants in this case study will be juniors and seniors in an undergraduate teacher preparation program offered by a state university at a statewide campus in their local community. The participants will have come into the program having earned an associate's degree or two years of course credits at the community college. The majority of students enrolled in this program are working full time outside of education. This teacher preparation program consists of two years of evening classes, plus a semester of student teaching. Before they engage in student teaching, the study participants will have had forty-five hours of teacher aide practicum as part of their education coursework. The students have families and roots in the community and will most likely remain in this geographic area to conduct their student teaching and to begin their teaching careers.

The pilot study participants, Group A, and half of the formal study participants, Group B, will attend classes that are held in an elementary school library in the district where I served as a teacher-librarian for ten years. Although relatively new to this school, the teacher-librarian is an experienced and effective collaborator. She has exceptional principal support for her work, which is exemplified in the principal's use of non-district funds to employ this teacher-librarian full time and to provide her with clerical assistance beyond the district's formula. The other half of the study participants, Group C, meet at a charter school that does not have a central library or a teacher-librarian. The lead faculty for Group C, who has been a classroom teacher and school principal, has not served as a teacher-librarian in her professional career.

As a lead faculty for this teacher education program, I facilitate four courses for Groups A and B participants. I have and will continue to integrate classroom-library focused learning engagements into the students' junior writing course, their early literacy course, the elementary curriculum course, and their social studies methods course. I will serve as a guest speaker and will model collaboration with the lead

faculty for Group C students. In addition to being their college classroom teacher, I help place Group A and Group B students in classrooms for their teacher aide practicum experiences. Some of these students were intentionally placed in schools where classroom teachers and teacher-librarians engage in collaboration; some were not. I have no input into practicum placements for Group C students nor do I have any influence over any of the participants' student teaching placements.

My beliefs about the value of classroom-library collaboration for students, teachers, and school cultures come from my graduate education in school librarianship and reading *Information Power* (AASL & AECT, 1989, 1998). They come from research studies that confirm what my practice has shown me – K-12 students and classroom teachers benefit from classroom-library collaboration. My beliefs developed over a 12-year period during which I served as a teacher-librarian in elementary school libraries and at the high school level. I believe collaborating with my classroom colleagues transformed our teaching practices, accelerated our professional growth, and helped us provide students with high-quality, information-rich learning experiences that propelled them as information literate, independent learners who understood, as they matured, the role of information in a democratic society. For me, classroom-library collaboration is fundamental of effective 21st-century education.

Methods of Data Collection and Analysis for the Components of this Study

The study participants will volunteer to respond to four online surveys. The first survey will be administered at the beginning of the elementary education undergraduate student's junior year. The pre-preservice education survey (Appendix A) focuses on the participant's prior experiences with school and college libraries and librarians and accesses his/her understanding of the roles libraries and librarians can play in schools and her/his experience with classroom-library collaboration. In addition to closed questions, the pre-preservice education survey includes an opportunity for participants to elaborate or clarify any of their responses. This invitation is offered on all four of the surveys.

During the first year of preservice education, I will integrate information, research studies and hands-on learning experiences with collaboration into at least four of participants' courses. A panel discussion presentation by teams of classroom teachers, teacher-librarians, and principals, classroom-library lesson plans, and my own teacher-librarian testimonials will provide additional support for learning about classroom-library collaboration. Excerpts from participants' reflection journals, class papers or examines, and other written communication will provide additional data.

At the end of the second year of the teacher preparation program, before they begin student teaching, the study participants will take the second online survey (Appendix B). These survey questions will help identify which of the above mentioned learning experiences/interventions have made an impact on the students' understanding of classroom-library collaboration. Participants will have the opportunity to volunteer for one or two small focus group and/or individual interviews, which will be videotaped and excerpts transcribed. Field notes will also be made during the interviews. The interviews will include open-ended questions that invite participants to go beyond the survey questions to elaborate on the personal meaning they ascribe to these learning experiences (Rossman & Rallis, 1998, Seidman, 1998).

Participants will again participate in an online survey at the end of their student teaching experience (Appendix C). This survey focuses on the students' actual practice of collaboration and their awareness of other educators' collaborative practices in the schools where they have served as student teachers. Specifically, they will be asked to share if and how they worked collaboratively with the school's teacher-librarian, if their mentor teacher collaborated with the teacher-librarian, and if there were structures in place in the school that provided time for classroom-librarian collaboration. This survey instrument and one that follows include an open-ended question that asks respondents to provide a list of factors that influenced their decision to collaborate or not to collaborate. Participants are then asked to indicate the factor that was most important in this decision. Again, participants will be invited to volunteer for small focus group and/or individual interviews.

Finally, the participants will take the fourth survey after their first year of actual classroom teaching (Appendix D). The questions from the third survey will be repeated with the participant him- or herself as the classroom-library collaborator. The open-ended question regarding support or constraints for collaboration will yield crucial data that may make reference to the collaborative learning interventions participants experienced during their preservice education. Participants will have the opportunity to volunteer for interviews.

The closed-ended question responses will be tabulated, and the data will be shared in terms of percentages. The open-ended questions and the interview data will use analyzed using the constant comparative method (Glaser & Strauss, 1967). My stance is that the data are emergent. I have no preconceived notions about what will most influence participants' practice of classroom-library collaboration. My qualitative research goal, therefore, is "to reach a deeper understanding of the participants' lived experiences" (Rossman & Rallis, 1998, p. 85). The results of the study will be submitted for publication in both online and print sources and will be shared at regional and national conference venues.

The Pilot Study

Sixteen undergraduate preservice teachers completed the online pre-preservice teacher education survey in the fall of 2004 at the beginning the first semester of their teacher education program. They will take the remaining three online surveys in December 2005 at the end of their preservice education, in May 2006 at the conclusion of their student teaching experience, and in June 2007 at the end of their first full year of classroom teaching. I have served as their instructor for four courses and will continue to mentor them until the end of their preservice education.

Pre-Preservice Education Survey

The first set of survey questions was designed to access participants' experiences with libraries as K-12 students. In their own K-12 student careers, all but one student attended elementary and middle schools with libraries; all of their high schools had libraries. 87% of the participants described themselves as regular library users in elementary school, 44% during their middle school/junior high years, and 50% were regular library users during high school. 56% reported that their classroom teachers sometimes worked with the school librarian; 31% indicated that their teachers always worked with librarians. However, only 19% noted that school librarians played a key role in their educational experience.

The next set of questions accessed the participants' prior knowledge of the teaching responsibilities of school librarians. 56% of the respondents believe that school librarians should not be responsible for teaching reading while 93% strongly agree or agree that school librarians should be responsible for teaching research skills. 56% also believe that school libraries should not be responsible for teaching every area of the school curriculum. All of the respondents strongly agreed (62%) or agreed (38%) that when school librarians and classroom teachers collaborate for instruction, student achievement should increase. Perhaps their responses to this particular question show that, research aside, it seems logical that student achievement would be positively affected by collaboration.

The final question on this survey asks if, as adults visiting and/or working in K-12 classrooms, participants have observed collaboration for instruction between classroom teachers and school librarians. 62% responded in the negative; 38% reported they had observed collaboration. So although 100% of the participants agreed that school library programs should be a critical part of the school's literacy program, only 38% had witnessed collaboration as the model for the library program's contribution to a school's learning community.

Classroom-Library Unit Plan Deconstruction

During the second course I facilitated for this group of students, Integrated Literacy I: Developmental Literacy and Language Arts in the Elementary School, we deconstructed a classroom-library unit plan I had co-taught a few years previously with a team of first-grade classroom teachers. The focus of the lesson was oral language experience (nursery rhymes); the organization of instruction was small group centers. I shared with students highlights of the planning process and together we examined how and what students learned in this unit of study. After our discussion, students were asked to work with a partner to create a Venn diagram that showed their understanding of the benefits of collaboration to students and to teachers as compared with a single teacher striving to teach these same concepts with the small group, center format or with a whole class organization for instruction.

All of the participants' Venn diagrams showed they deduced that when educators collaborate they generate more ideas and creativity and can cover more standards and/or material. They felt that these learning activities would be more interesting to children because of the variety. Participants noted that children could receive more one-on-one attention and instruction, and one group pointed out that students wouldn't have to wait as long to have questions answered as they would with just one teacher. One group observed that there was shared responsibility between the adults for guiding and monitoring the children's work. Two out of ten diagrams noted that working toward a common goal was a positive aspect of this model.

Three groups felt that the collaborative structure was more time and effort efficient.

Only one team noted that children would learn better. Considering their pre-preservice education surveys in which 100% of the respondents agreed or strongly agreed that collaboration should result in higher student achievement, one might expect more groups to cite this benefit. This finding, however, is consistent with research related to preservice teachers' readiness. Research has shown that new teachers, and by extrapolation preservice teachers, tend to focus on their own actions within the classroom rather than on what the children are learning (Darling-Hammond & Harmmerness, 2005, p. 400).

Classroom-Library Panel Discussion and Reading the Research

During the first few weeks of the participants' elementary curriculum class, I invited a panel of classroom teacher, teacher-librarian, and principal teams from two schools to share their collaborative work with the preservice teachers. One of the texts for this course is Loertscher and Achterman's book *Increasing Student Achievement through the Library Media Center: A Guide for Teachers* (2003). Before the panel visit, the study participants' had engaged in discussions related to collaboration. I had provided a mini-lesson that focused on the distinctions between cooperation and collaboration as well as a review of the benefits to students, including achievement, and to teachers, including collegiality and professional development. Students individually prepared a list of questions in advance of the panel discussion, which began with a presentation by each school's team.

During their presentation, the panel shared standards-based collaborative unit plans, research strategy handouts in K-5 student-friendly language, graphic organizers, and student assessment rubrics. In addition, the teams also passed around examples of students' learning artifacts and shared student work that was published on the Web. The classroom teachers and teacher-librarians shared their experience of collaboration from both personal and professional perspectives. The principals shared the value they place on these collaborative practices and the many ways they support these learning and teaching opportunities in their schools.

Although the preservice teachers asked few questions during the presentation itself, their concerns were evident in the question-and-answer period. Although the unmistakable focus of the panel and that evening's class was clearly collaboration and the majority of the students had brought prepared questions on that topic, many of their questions were related to interviewing for jobs, offering advise to new

teachers, and delving into political issues in education, such as the No Child Left Behind Act of 2001, the focus on high-stakes testing, and standards-based instruction. I am a firm believer in following the students' interests so I did not attempt to redirect their questions. However, as a researcher, I was disappointed in the data collected during the panel discussion.

Upon later reflection, I realized that one way to improve the impact of the panel is to ask teacher-librarians to invite novice, rather than veteran, teachers to be on their presentation team. The depth of the curriculum planning and instruction demonstrated was exemplary. It may have been too sophisticated for preservice teachers, who may have had trouble picturing themselves in these scenarios. In addition, the participants' assignment for that week had been to compose a letter of interest for a teaching position; their focus on interviewing and landing a job was the natural result. For Groups B, I will be particularly aware of the homework, in addition to questions for the panel, due on the evening of the presentation.

After the panel presentation, students made astute observations in their response journals. These examples are representative of the range of comments:

> I cannot imagine why teachers do not jump at the prospect of having someone brainstorm ideas, help with lesson planning, and provide a new perspective on the classroom curriculum. As stated by [one principal], "Teacher and teacher-librarian collaboration provides higher achievement. The librarian is the only one who impacts all the children leading to academic success and works with every single teacher."
>
> When teachers can brainstorm with someone who has a different background and skills, they have the ability to create great things.
>
> Each teacher and teacher-librarian had many stories and examples about how collaborating enabled them not only to come up with more creative lesson plans, but also to better assess themselves and the quality of their lesson. Having another person's perspectives and observations is enormously helpful.
>
> I learned that you are never alone; there is always someone there to help.
>
> I was impressed with how much the teachers and principals value their librarians and were very picky when choosing one for their school.
>
> Before this class, I never thought it would be "okay" to ask a librarian to collaborate. It hadn't crossed my mind that a librarian would even do so. It is possible that I feel this way because during my elementary experiences, my teachers would basically dump us there [in the library] for lesson planning time.

These responses indicate that the pilot study participants' paradigm of classroom teaching as an isolated experience for individual teachers was affected, and they were positively influenced toward classroom-library collaboration by the panel discussion.

Further Collaboration Data

One of my objectives for the interventions in the study is to infuse the participants' preservice teacher education program with collaboration concepts and strategies. To that end, we revisited this learning and teaching model often. I included an essay question related to our exploration of collaboration on the final examination for the elementary curriculum course: "Compose a definition of collaboration. Then write a paragraph about the benefits of classroom-teacher and teacher-librarian collaboration." Participants' responses about the benefits of collaboration clustered around these concepts (Table 1).

Table 1
How Participants Define the Benefits of Classroom-Library Collaboration (N=16)

Concepts	Times mentioned	Percentage
More individualized attention for students	11	69%
Increased ideas	9	56%
Increased/integrated resources	9	56%
Increased creativity	8	50%
Broader perspectives on curriculum	7	44%
Support for planning	5	31%
Shared responsibility for curriculum	3	19%
Increased potential for success	2	13%
Lesson/unit assessment	2	13%
Increased student achievement/motivation, Integrated curriculum, Modeling partnership or teamwork, Professional growth for teachers, Support for curriculum standards	1	6%

Clearly, the participants understand the benefits of collaboration for students. As teacher aide volunteers, they have had occasion to work one-on-one and with small groups of students, and realize that lowering the student-to-teacher ratio assists both students and teachers. Access to more ideas, integrated resources, and increased opportunities for creativity was noted by more than half of the participants. Another of the most encouraging concepts was the understanding that collaboration results in broader perspectives on curriculum. If these benefits become values for these preservice teachers, the likelihood that they will practice collaboration with colleagues, teacher-librarians and others, may increase.

On the other hand, only one of these preservice teachers mentioned student achievement as a benefit of collaboration. Although achievement can be inferred from some of the other concepts, particularly individualized attention for students, it was surprising that more participants did not cite this benefit. This was especially unexpected since one of our texts was *Increasing Student Achievement through the Library Media Center: A Guide for Teachers* (Loertscher & Achterman, 2003).

We continued the use of the Loertscher and Achterman text in the social studies methods course, the final course of their first year in the program. We continued our collaboration conversations and worked with *Information Power*'s information literacy standards for students (AASL & AECT, 1998) in our social studies explorations. On the final examination for that course, I provided a scenario in which the social studies standards had changed for 6th grade and the textbook did not address that particular concept or historical event. I asked the students what they would do. Six out of sixteen students (38%) said they would attempt to collaborate with colleagues; only four (25%) mentioned collaboration with the teacher-librarian. The infrequency of a collaboration response was surprising and will prompt me to reconsider additional strategies to help students integrate this model into their curriculum problem-solving schema.

Practicing Collaboration

Collaborative learning engagements and projects were integrated into all four of the courses I facilitated. Partners worked collaboratively on many assignments and small groups of up to five people worked on large scale projects such as year-long planning and designing curriculum units. Role play was used to learn and review some of the skills and strategies for collaborative work. In addition, I served as a mediator for groups for groups that solicited my facilitation when communication broke down. As in life, some times the groupwork was more productive than at other times. Some students were more comfortable working in teams than others; some surprised themselves by having positive collaborative experiences. Reflecting on the impact of collaboration was part of every rubric in which this model was utilized.

Although I had suggested students work with a partner in their fall 2004 teacher-aide practicum, only four students followed my suggestion. I provided opportunities for these two teams to share their opinions and positive experiences of coteaching. In the spring of 2005, 13 of the 16 participants in the pilot study conducted their 15-hour teacher aide practicum experience with a partner. For the most part, these coteaching experiences were successful as evidenced by the students' feedback on their observation lesson reflections and the anecdotal comments they recorded in their practicum journals. For future cohorts, I will more strongly suggest a collaborative practicum experience. As a result, I revised the post-preservice education survey to include a question about the impact of collaboration during the practicum experience: "During my preservice education, my own experience collaborating for instruction with a classmate during my practicum increased the value I place on collaboration" (Appendix B).

Conclusion

The official study, Two Heads Are Better than One, will begin in the fall semester 2005. The second group and third group of participants will take the online surveys in September 2005, May 2007, December 2007, and June 2009. Interviews will be held after the 2007 and 2009 surveys. I will be the lead faculty for approximately half of these study participants, who will engage in learning experiences similar to those of the pilot study group. For the other half of the fall 2005 participants, I will serve as a guest speaker and/or collaborator with their regular teaching faculty. I will share results at each stage of the study with the teacher-librarian community as well as with the larger educational community.

Although teacher-librarians "must become proactive in articulating their roles, [and] they must also be ready to explain how their programs are related to education reform initiatives and to the skills students will need to succeed in the twenty-first century" (Shannon, 2002), it is likely that introducing preservice classroom teachers to the benefits of classroom-library collaboration and making a case for implementing this model through practice can speed its institutionalization. Helping preservice teachers to collaborate effectively in their preservice teacher education programs will prepare them for collegial work in schools and for career-long development as professionals. Whether those collaborations are with grade-level colleagues, teacher-librarians, specialists, or other school faculty, staff and families, the interventions set out in this study will serve preservice teachers well. "Working together in communities, both new and more experienced teachers pose problems, identify discrepancies between theories and practices, challenge common routines, draw on the work of others for generative frameworks, and attempt to make visible much of that which is taken for granted about teaching and learning" (Cochran-Smith & Lytle, 1999, p. 293).

The rapid-fire change of 21st-century life in the United States can be felt in our schools as well. Novice as well as veteran teachers need and will continue to need support for negotiating changing curriculum and policies. "In school restructuring, teacher isolation has been identified as the most powerful impediment to reform" (Lieberman, 1995). The organic nature of the classroom-library collaboration model offers on-site professional development integrated into the daily practice of classroom teachers and teacher-librarians. While there is an agreement that students and teachers should excel at information problem-

solving, it is not as widely accepted that classroom-library collaboration is the most effective strategy for teaching information literacy standards. Collaborative learning and teaching experiences supported by the research on the impact of classroom-library collaboration on student achievement may help privilege this practice and provide future classroom teachers with a firm foundation for integrating collaboration into their professional work.

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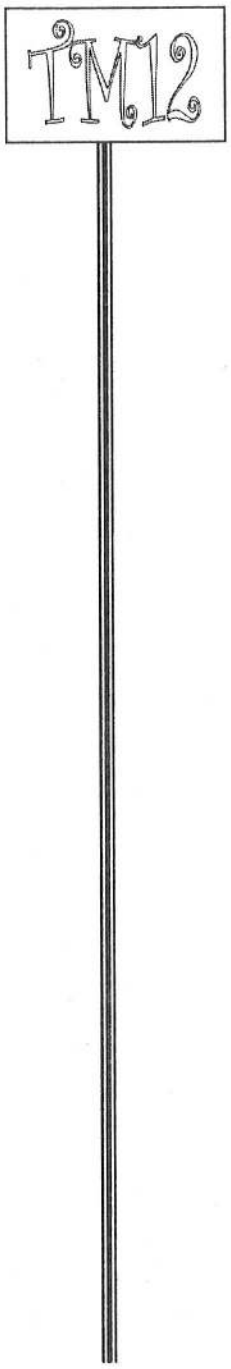
List of Appendices

Appendix A: Pre-Preservice Education Survey
Available at: http://storytrail.com/TwoHeads/presurvey.pdf

Appendix B: Post-Preservice Education Survey
Available at: http://storytrail.com/TwoHeads/postsurveypreservice.pdf

Appendix C: Post-Student Teaching Survey
Available at: http://storytrail.com/TwoHeads/postsurveystudentteaching.pdf

Appendix D: Post-First Year Teaching Survey
Available at: http://storytrail.com/TwoHeads/postsurveyfirstyearteaching.pdf



Understanding Our Students
Readers' Advisory in the School Library

Ann Dutton Ewbank
Arizona State University

Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Introduction

This paper describes part of a year-long study that I conducted at Desert Haven Middle School*, located in a large urban school district in the Southwest. It highlights the findings around an important, but somewhat neglected, issue regarding school libraries—the role of teacher-librarian as readers' advisor. During the 2004-2005 school year, I served as both the school's teacher-librarian and as a reading teacher to a class of 22 seventh grade students. I recruited six focal students from the reading class and examined how I advised them on their free reading choices as their teacher-librarian. This paper examines the interactions I had with three of the focal students.

Having served as my school's teacher-librarian for the past five years gave me insight into the reasons why students choose free choice materials. When students asked me "What's a good book?" my suggestions were often countered with "It's too long!" or "It won't fit in my binder!" Most teachers at my school required students to have a book on hand at all times for silent reading, but often, it had to fit into the constraints of what the teacher perceived as "good" literature or conform to a particular genre.

Students seemed to respond with their own constraints, most notably page limits and book size. In other words, an implied canon is alive and well (on the part of both students and teachers, although the canon seems to have different meanings for both groups), and it certainly impacts the way that I advised students looking for free reading material in the library. I wanted to explore how I could be an effective readers' advisor to students.

This study utilizes teacher research, where I systematically and intentionally studied my own practice (Cochran-Smith & Lytle, 1993). Teacher research has value to both the academic community as well as the teaching community and "constitutes another legitimate arena of formal knowledge about teaching" (Cochran-Smith & Lytle, 1993, p. 18). Teacher research allows for an *emic*, or insider, stance (Fecho, 2000), which seeks to recognize that as practitioners we can add to the body of knowledge that we call educational research. Being an actor in the events recorded positively informed my study. This insider stance complements other forms of school library research. Additionally, I liberally use contractions and colloquial language in places, as teacher research lends itself to an informal writing style due to the importance of context (Fecho, 1995).

Data were collected through individual student interviews, readers' advisory interactions, panel discussions, student response journals and reading logs, and an audio journal that I kept throughout the school year. I analyzed data using HyperRESEARCH, a qualitative analysis program that allowed me to code and categorize the data to arrive at assertions (Erickson, 1986) and also through narrative inquiry. Writing the narrative allowed me to pose additional questions, to connect incidents and transactions in the classroom to theory, and to view the classroom and students through a variety of lenses. Narrative provides different and possibly new types of understandings to surface within the vast body of educational research (Barone & Eisner, 1997). As Connelly and Clandinin (1990) state, narrative inquiry in education "bring(s) theoretical ideas about the nature of human life as lived to bear on educational experience as lived" (p. 415). Through the story of the three students, we can learn more about effective readers' advisory in the school library.

A Theory of Multiliteracies

I viewed the events and experiences that I had with the students through a theory of multiliteracies. The New London Group (1996) posits that traditional literacy pedagogy is relegated to the written word, and a restrictive form of the written word at that. Multiliteracies, on the other hand, "focuses on modes of representation much broader than language alone. These differ according to culture and context, and have specific cognitive, cultural, and social effects" (p. 64). The authors use the term "metalanguage" to describe a way of interpreting various modes of meaning. Acknowledging the fact that literacy is indeed multimodal, they outline elements of design within the multimodal structure that include gestures, visuals, spatial considerations, linguistic design, and audio design. Thus, literacy is much more than the written word and that virtually everything can be read as a text. I connect the theory of multiliteracies to this study because over the course of the school year, the students and I lived in a multimodal environment.

I knew that students, when given the chance, would gravitate toward electronic media, and that instinct was validated when I offered students the option of using our wireless laptops during free choice reading periods in our reading class. Every time the students were given this option, they chose the laptops over print material. The students are proficient in instant messaging (IM), e-mail speak, symbolic codes in written notes, video games, and multi-person computer chat. The catalyst for the publication of such novels as *TTYL* (Myracle, 2004), *Shooter* (Myers, 2004), *Give a Boy a Gun* (Strasser, 2000), and *Monster* (Myers, 1999), which all use alternate methods of presenting prose (e-mail, interviews, news excerpts, and a play, respectively) is the acknowledgement of young adults' multiliteracies.

Research on Students' Reading Behaviors

We know that choice in reading material can increase student interest in the classroom (Strickland, 1993; Olson, 1998). But what about the factors that are involved in independent reading for pleasure? Numerous studies have indicated that reading for pleasure severely declines during the middle school years (Watkins & Edwards, 1992; Greaney & Hagerty, 1987; Moffett & Wartella, 1992; McCoy et al, 1991). Additionally, recreational reading seems to be given a lack of attention in schools (Block & Mangieri, 2002). The case for independent reading as a developer of reading ability is overwhelming (Krashen, 1993), so it behooves educators to find ways to encourage this practice in students.

Furthermore, light reading and comic book reading seems to have a positive impact on student motivation to pursue more complex reading (Feitelson and Goldstein, 1986; Dorrell and Carroll, 1981; Krashen, 1993). As Russikoff and Pilgreen (1994) noted in their study of doctoral students' reading history, teachers and parents should not fear that young adults who read magazines, comics, and serial novels will stop short of reading more substantial texts in their lifetime. Finally, good readers do not "give up" light reading; rather, they "add on" more significant and complex literary works throughout their lives (Donelson & Nilsen, 2005).

If light reading for pleasure can lead students to more sophisticated reading selections, the classroom teacher is well advised to encourage students to read materials outside of the curriculum. However, independent reading is currently less privileged in public education than skills-based reading instruction, and often not mentioned in the curriculum, which can limit a teacher's role in encouraging students to read on their own. Perhaps the teacher-librarian as readers' advisor can offer critical support for students' literacy development.

Reader's Advisory in the School Library

The appreciation and importance of literature is presented as the foundation of all other school library activities in *Information Power: Building Partnerships for Learning* (AASL & AECT, 1998). However, researchers have questioned the lack of attention to readers' advisory in school libraries in light of all the other roles the teacher-librarian must play (Valenza, 2003). Research has shown that mere access to books is not enough (Haycock, 2001). Students without guidance to interesting reading materials may choose not to read at all. Therefore, teacher-librarians may play an important role in the development of students' independent reading habits.

Many recommended reading lists are available to help teacher-librarians guide students in their reading choices. Annual Honor Lists compiled by Blasingame, Donelson, and Nilsen (2001, 2002, 2003), the New York Public Library's (2005) *Books for the Teen Age*, and the Young Adult Library Services Association's (2005) lists, including *Quick Picks for Reluctant Readers* are all worthwhile sources. Teacher-librarians also give ideas for promoting books, such as labeling appealing titles differently (Covey, 1991) and adding a "recommended for students" demarcation in the electronic catalog (Johnson, Berg, & Durocher, 1991).

Doll (2001) presents guidelines on performing readers' advisory in the school library. She provides a substantial description of the factors impacting the practice. Teacher-librarians function as teachers in the school setting, and therefore form different relationships with the students that they serve. Where a young adult public librarian might see a multitude of teens who choose to come to the library in a given afternoon, a teacher-librarian has, essentially, a captive audience. Furthermore, the school setting has different expectations for library use and student conduct. Having the ability to discipline students and teach classes inherently impacts the relationship between teacher-librarian and student. On the other hand, students sometimes see the teacher-librarian, who rarely assigns grades, as less of an authority figure than a classroom teacher.

Doll also provides an overview of reader's advisory techniques employed in the school library, including reading aloud, storytelling, reader's theater, booktalks, author visits, and book clubs. She particularly emphasizes that the teacher-librarian is most effective at reader's advisory when she has read the books she recommends to students, a concept echoed by other teacher-librarians. Jones (1999) describes how she failed miserably at reader's advisory with seventh grade students until she began reading and enjoying young adult books herself. Because of the age designation placed on young adult literature, many adults do not realize that much of it is simply good literature that features younger characters (L. Jensen, personal communication, May 7, 2005).

Although the specific tenets of reader's advisory in a school library setting are mediated by its context, there are basic methods to employing good reader's advisory that transcend context. Shearer (1996) defines the reader's advisory transaction as "an exchange of information between two people with the purpose of one person's suggesting text for the other's later reading interest" (p. 3). In essence, every readers' advisory interaction is a learning experience. Students can learn to ask themselves the guiding questions that can help them eventually find books on their own, or recommend books to others.

Building on Shearer's basic definition, Benedetti (2001) gives tips for conducting reader's advisory with teens. A young adult public librarian, she recommends asking the question, "Tell me about a book you liked" (p. 242). She also recommends narrowing the age range recommendations for target books. There are vast differences in the reading interests of a 12 year-old versus a 15 year-old. Finally, she states that the advisor should be honest about whether she has read the book and not try to oversell a book either.

These guiding principles helped me as I worked with students. My readers' advisory interactions with Chloe Brennan, Christian Wovitski, and Zach Strauss over the course of one school year

illustrate how I used these ideas in practice with students. The better I understood these students, the more meaningful our readers' advisory interactions became. A willingness to get to know the students was the key in leading them to appropriate independent reading choices.

The Context of the Study- Desert Haven Middle School

The Desert Haven Middle School library is located in the middle of campus, occupying six former classrooms that have been remodeled into an open space. Access from the west entrance brings students and staff into the reference room, and access from the east brings them into the main stacks and computer area. Rectangular tables with rose and birch- colored laminate populate the space. A bright red accent wall partially divides the reference section from the general stacks, creating a dedicated quiet area in an otherwise open floorplan.

Almost half of the library collection is fiction. In the five years that I was the teacher-librarian, I added many new titles to the fiction section, including the very popular *Tokyopop* manga series. Graphic novels were something I felt very strongly about adding to the collection, despite some teachers' qualms about these books not being "real" novels. They have consistently been the most circulated books since 2002. The fiction shelves surround the five shelving units that hold the biography and non-fiction collection. These books primarily support the school's curriculum and are checked out less frequently than the fiction, but serve a valuable purpose for research and personal inquiry.

The library is rarely quiet in the morning or at lunch. It is a space for socialization and relaxation during the fifty minutes per day that students' time isn't regulated. Of course, books get checked out and homework gets done during these times, but the primary activity is socialization. There is little about the Desert Haven library that is business-like. Over the years, I have attempted to create a space where students are welcome and their need for socialization is honored. This is not to say that there aren't rules in the library, but one might be surprised at the amount of movement and noise during the students' free time.

Other times during the school day, the library is full of purposeful activity. The Desert Haven library operates on a flexible schedule, meaning that teachers bring their classes in as their curriculum dictates. One might come in during a given week to find a science class researching diseases, or a social studies class participating in a mock election. While all this activity is going on, it is not uncommon for teachers to send five students down to check out a book as well.

However, the budget constraints in our school district directly impacted the library during the study. I had arranged with my principal to work part-time in order to focus on this study. When my employment was reduced to part-time, a decision was made to hire a library aide instead of a certified teacher-librarian for the afternoon shift to save money. The first library aide resigned in January, and the library was closed in the afternoons for two weeks before a replacement was hired. Then, seven weeks before the school year ended, the replacement library aide was moved into the front office and the library was closed in the afternoons. Additionally, since the library aides were not certified teachers, no substitutes were available to staff the library when the aides were absent. The library simply closed. These closures impacted the amount of access that students had to the library, and perhaps less obviously, how students viewed the library program. Rather than an integrated, fully operational center of the school, the library became an intermittent stop for many students due to budget decisions.

Despite the interruptions to library service, Chloe, Christian, and Zach were frequent visitors to the library. As I interacted with them, I learned their life stories, their interests, and their propensity for independent reading. In the following sections, I tell the stories of our readers' advisory interactions. Through these stories, we can learn about the role of the teacher-librarian as readers' advisor.

Chloe Brennan

Chloe self-identified as disliking reading. She saw reading as something to do when all other options for entertainment were exhausted. When she had watched too much television and used the Internet for too long, only then would she read a book. The fact that Chloe immediately associated reading with boredom, and consequently, not recreation, was interesting, especially since a few minutes later in the same interview when she told me she didn't like reading, she said she had read thirty-three books in *The Baby-Sitters Club* (Martin, 1988) series.

Although I believe that Chloe liked *The Baby-Sitters Club* series because she could relate to the characters' lives, I think she also liked them because of their predictability. When she read outside of her comfort zone, and came across something difficult, she would immediately find the book "boring." In one of our interviews she told me that she had trouble with *To Kill a Mockingbird* (Lee, 1960) because of the Southern dialect used.

As a reading teacher and teacher-librarian, a dilemma I often faced was the pressure to move students to more sophisticated and therefore, perceived by the school as legitimate, reading materials. Is *The Baby-Sitters Club* inferior in some way? Why the pressure to direct Chloe and the many other students like her to read so-called "better" books?

A quick scan of the New York Times' bestseller list (New York Times, 2005) includes authors Danielle Steel, James Patterson, J.A. Jance, and Nicholas Sparks. These are not Pulitzer-prize winning authors. They are popular, and write entertaining literature. This is what many adults are reading, if they are reading at all. Therefore, if I defined my primary goal as readers' advisor as to create lifelong readers, then why would I point Chloe toward material that she wouldn't enjoy? Why not encourage her to continue reading the familiar series novels that she liked so much?

By analyzing Chloe's reading interests and behaviors through Donelson and Nilsen's (2005) "Stages of Literary Appreciation" (p. 39), I realized that she was on the cusp of moving from one stage to another. The stages are based on the autobiographies of adults who love to read. In the late elementary years, series books and fantasies are popular literary materials and the reader "gets into" a particular series or author. During the junior high years, readers tend to move to problem novels and realistic fiction, seeking books that mirror their own lives. Although Chloe privileged all sorts of activities before reading, she still did it and enjoyed it, but it needed to be on her terms.

I'm glad I encouraged Chloe to continue reading what she enjoyed, which, at that moment in time, happened to be formulaic series novels. I think she will come to enjoy more complex literature in time. She just wasn't quite ready for it yet during our year together. I think that our development as lifelong readers is not as linear as we educators think it should be. Donelson and Nilsen (2005) certainly support the idea of going back and forth through the stages of literary appreciation. I think Chloe will get there. She will continue to read and she will read increasingly complex materials. We just have to give her some time.

Christian Wovitzki

My relationship with Christian was strong from the beginning. Christian was a big gamer. He was awed by stories of my husband, who reached mythical proportions in the minds of many of the male students I spoke to. As I described the latest video and computer games with indelible accuracy and knowledge, many students wondered how a teacher would know this kind of stuff. I explained that my husband was an avid gamer, and that we had every video game system available on the market, as well as just about every outmoded system in the antiquated computer museum in our house. The boys were always blown away by my descriptions of a typical evening

in our house, where I sat in my easy chair surfing the Internet on my wireless laptop, and my husband sat on his couch playing *EverQuest* (Sony Online Adventures, 2004) or *World of Warcraft* (Blizzard Entertainment, 2004) with his online friends as he simultaneously surfed the Internet while we both watched TV on our 65-inch HD screen. "Your husband's cool," I remember Christian saying. My ability to relate to Christian in this manner, to understand the appeal of the multimedia environment that seventh grade students live in, was definitely an asset.

Christian associated the reading he did in school with boredom. Christian loved to read, however, for meaning and purpose on his own terms, and that was the only way he would truly engage in reading. He enjoyed reading magazines about RC (remote control) cars, weapons, and 4 x 4 vehicles. He and his father were avid shooters and off-roaders. There were two times when he approached me for advice on reading materials while in the library. One day, Christian came to the library looking for books on Poland. I asked him if he was doing a report, and he replied that he was Polish and he wanted to learn more about his heritage. I sent him on his way with two books on Poland.

The following day, I helped Christian find some Internet resources on Polish heritage as well. He found a web site that described the Polish-American Association and its youth organization, the Polish Falcons. He printed all of the information about the organization and showed it to his mother, in hopes of starting a branch of the Polish Falcons in Phoenix. I wasn't successful in steering him toward literature because of my knowledge of his heritage, but Christian found something that he enjoyed reading.

The other significant readers' advisory experience that I had with Christian involved his love of video games. It was fall, and the game *Grand Theft Auto: San Andreas* (Rockstar, 2004) had just been released. It seemed like every boy at the school was playing it, even though it was rated for seventeen-year-olds and older. My husband bought it the day it came out, so I had been watching him play the game and was familiar with it. This helped me to make a connection with Christian.

I asked Christian if he would be interested in reading a strategy guide for the game that I had at home and he agreed. And here I ran into the dilemma of going outside school-sanctioned materials to encourage Christian to read. As this video game was rated for seventeen year-olds, would it be appropriate for me to give him this material to read? His mom had purchased the game for him and didn't have a problem with him playing it. In the end I decided to keep the strategy guide at home and gave him the title information so he could find it on his own.

Because Christian was disinterested in reading young adult literature, I took some risks in providing opportunities for him to engage in reading, including directing him to materials that might not be considered appropriate by school standards. The relationship that I developed with Christian was the key to leading him to interesting reading materials. He knew that I cared about his interests and activities and felt like he could seek me out for advice. I strived to get to know every student like I knew Christian. Sometimes it worked and sometimes it didn't. However, the better I knew the student, the better I could advise him or her about potential reading materials. This is the most important lesson I learned while working with Christian.

Zach Strauss

Zach self-identified as enjoying reading. When we met in the fall, he told me that his favorite book of all time was *Jeremy Thatcher, Dragon Hatcher* by Bruce Coville (1991). His library teacher had recommended it to him in the sixth grade. He said it was his favorite book because "it told you about what it would be like if you raised a baby dragon."

This wasn't much for me to go on when recommending books to Zach. I soon found out that lighthearted fantasy wasn't necessarily his cup of tea, based on his love of *Jeremy Thatcher, Dragon Hatcher*. He didn't seem to like other books by Bruce Coville, either. I would recommend a book to Zach, he would read the first few pages, and then be back in the library twenty minutes later looking for a new book. I suspected that his difficulty in finding and sticking with a good book had something to do with his semi-chaotic home life (he lived with six siblings in a four-bedroom house).

However, reading books for pleasure was something that was also privileged in his house. Zach had a role model for reading in his mom. He said that she often took him to the public library, and his mom was always reading. Zach indicated that he liked to come to the library during class to read. He came to the library almost every day. He said that he would get his assignments finished and ask permission to come down to the library. He liked to come to the library because it was quieter than his house, and he could actually get some reading done.

When Zach came to the library, he would head immediately to the OPAC (on-line public access catalog), search for a book, locate it on the shelves, and then sit down in the soft seating area and begin to read it. Many of the other students who were allowed to visit the library during class time were less focused on getting reading material than hanging out with their friends, browsing the magazines (the library didn't allow checkout of magazines), or just sitting around. Zach always seemed to have a purpose when he came to the library, and his purpose was to find a book that grabbed him as much as *Jeremy Thatcher, Dragon Hatcher* did. He indicated in one interview that he loved the book so much because his former teacher-librarian recommended it to him.

Although I was very willing to help Zach find books that he would enjoy, I wanted him to become more self-sufficient in finding his own books. I wanted to serve as more of a guide than as the authority on good books for Zach. Zach sought me out for readers' advisory quite often. Zach attempted to read *Jacob Have I Loved* by Katherine Paterson (1980) (he chose this book because I told him that it was my favorite), *The Lost Boy* by Dan Pelzer (1997), and *Eragon* by Christopher Paolini (2003). He finished and enjoyed *A Child Called It* by Dan Pelzer (1995) and *The White Fox Chronicles* by Gary Paulsen (2000).

The books that he finished were books that he chose on his own, having received recommendations from fellow classmates. I encouraged Zach to continue seeking out books, and if he didn't enjoy a book, to put it down and find another one. I also counseled him to try to stick with a book a little longer than he usually did, for sometimes it takes a little while to get into a book. Ultimately, Zach displayed many of the characteristics of developing into a lifelong reader.

There are many reasons why Zach enjoyed reading young adult literature, but perhaps the biggest influence lies in his home life. It was clear that his mom, if not his family, routinely privileged reading for pleasure over other activities. And like many avid readers, Zach could recall memorable events and experiences he had with different books. Books and reading were an integral part of his life. I think Zach will continue to interact with books in meaningful ways as he continues through adolescence.

Readers' Advisory: What Have We Learned?

There are many reasons why a school library collection is developed. First and foremost, it exists to support the curriculum. However, most schools recognize that appreciation for literature is vital in the development of good readers. Therefore, most school libraries have an extensive fiction collection.

Where it gets sticky, however, is in the selection of that fiction. There are lots of opinions about what makes good reading material for kids. Donelson and Nilsen (2005) point out that some people believe that children's and young adult literature should teach a lesson or transmit a moral. Others believe that elements of good literature are embedded in its prose. I have long been a proponent of expanding the school library canon to include alternative presentations (such as graphic novels) and acceptance of popular and serial books.

In my five years as Desert Haven Middle School's teacher-librarian, I expanded what I saw as a very narrow selection policy to include graphic novels, video game magazines, more series books and novels with gay and lesbian characters. I also eliminated a shelf restricted to eighth grade students only and incorporated some of those books into the regular collection. These changes have led to some conflicts over books with faculty and parents, but overall, it was a positive experience. I was able to provide what the students wanted, and circulation increased as a result. The data from this study demonstrate that, as teacher-librarians, we must offer materials that students want to read, not what we think will be good for them.

In this regard, when conducting readers' advisory, teacher-librarians need to recommend materials located both inside and outside the canon, and perhaps even outside their collections. I realize that this is risky. Walking close to the edge often invites conflict, and sometimes that conflict can explode into full-scale challenges of both books and the teacher-librarian's professional judgment. But we must make a decision. Do we want to play it safe, or do we want kids to read more?

Relationships played a key role in my ability to be an effective readers' advisor. The better I knew a student, the better I could recommend reading materials for him or her. There was a specific reciprocity that was built within these relationships. I made it clear that I was there to help the students find what they needed and was able to provide a comfort level that, according to my conversations with colleagues, is not all that common in school libraries. Research on teacher-student relationships demonstrates that students who forge caring relationships with adults inside the school structure are more motivated and successful in school (Murdock & Miller, 2003). Students define a caring relationship as an adult paying attention to his or her needs and providing guidance (Alder, 2002). These principles are at the heart of every readers' advisory, which at its core, is a human interaction.

Some students are simply drawn to the library. Others have to be coaxed in. A willingness to help and a pleasant attitude are often all that is needed to plant the seeds of a relationship. We would be wise to attempt to forge this kind of relationship with every student that walks through the library doors. However, given staffing and time constraints, it's just not possible to have a fifteen-minute conversation with every student. There are ways to project this willingness to assist in a manner that is more economical. Simply opening the library during student free time is one way. Approaching students rather than waiting for them to approach you is another. I have found that the most powerful way to develop relationships with kids is through "small talk". When a student walks through the library doors, we often talk about everything *but* books. This gives me valuable background information that can help me when the student is ready for some readers' advisory.

I predicted that my data would demonstrate that I better advised the students who self-identified as enjoying reading. What the data revealed, however, was that the student's self-perceived level of reading enjoyment was not a factor in readers' advisory interactions. Rather, readers' advisory success was based on the number of meaningful interactions I had with the students. I had deeper relationships with both Zach and Christian than I did with Chloe, and was able to advise them better as a result. Viewing readers' advisory as a part of a more complex relationship with a student is important.

What More Do We Need to Know About Readers' Advisory in the School Library?

I cannot say enough about the importance of the relationship that is developed between the student and the teacher-librarian when advising students about reading material. While this study begins to address the issue of readers' advisory in the school library, and indicates that developed relationships and a willingness to recommend materials both inside and outside the literary canon are the key to more meaningful readers' advisory, more research needs to be conducted about the nature of readers' advisory in the school library.

Specifically, we need to learn about other factors that influence successful readers' advisory. We need research on how readers' advisory supports the curriculum in general, and how it supports a school's stance on independent reading. We need to know more about the particulars of readers' advisory transactions in the school library. What do they look like? We also need to learn more about the impact of advising students to read both inside and outside the traditional literary canon. What are the factors that influence teacher-librarians' recommendations for reading material? Research on these issues can help us to better understand readers' advisory in the school library, and consequently help teacher-librarians to provide better readers' advisory.

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An Examination of the Correlation of Research Information Literacy Competence and Social-Emotional Behavior Among High School Students

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Hi Willow Research and Publishing

An Examination of the Correlation of Research Information Literacy Competence and Social-Emotional Behavior Among High School Students

Abstract:

The purpose of this research was to investigate the degree of correlation of information literacy competency and social-emotional behavior of high school students. Specifically, three assessment instruments were administered to a sample of ninth and eleventh grade students in Orange County. Respondents indicated the relative degree of their information literacy competency and social-emotional behavior. Sample research reports of those students were rated by their teachers. Correlation statistics tested hypotheses linking literacy and behavior. Persistence and "getting along" were the best predictors of information literacy and research success.

Introduction

K-12 library media programs are trying to establish correlations between well-implemented library service and student achievement. In terms of curriculum, school librarians tend to focus on information literacy. In attempts to measure information literacy competency, professionals are examining student research processes, and developing corresponding rubrics. School librarians are using those rubrics more specifically to assess student work, although such work is difficult to generalize and extrapolate or do on a large scale.

These assessments tend to focus on cognitive skills, with little regard to student's social-emotional-motivational competence. The main seminal work in this area has been conducted by Carol Kuhlthau, who tracked students' emotional status during their research process. However, little research has been conducted in the area of emotional readiness with respect to information literacy. Just as with reading readiness, there may be a developmental and psychological aspect that influences student success with regard to information literacy.

Ellis and Bernard have led the research in social-emotional behavior therapy, which examines student's affective-motivational characteristics as contributing independently from students' cognitive characteristics to student achievement. On a broader scale, the Collaborative to Advance Social and Emotional Learning have identified key social and emotional competencies, which include several that align with information literacy: problem identification and solving, communication skills, and social skills of cooperation and help-seeking. Thus, as students exhibit positive social-emotional behavior, they may be more likely to achieve information literacy competency.

Based on these premises, this research investigated the correlation of social-emotional behavior and information literacy competencies of sample high school students.

Research Questions

Based on the statement of the problem, the guiding research questions were:

1) To what degree does a correlation exist between students' social-emotional behavior status and students' research information literacy competence?

2) To what degree does a correlation exist between students' social-emotional behavior status and students' research project quality?

If a significant correlation exist, then the next step in social-emotional behavior therapy may be investigated. Specifically, school librarians would focus on critical affective and behavior competencies within the information literacy framework, and provide effective interventions so students would be given opportunities to learn and practice these behaviors during the research process.

This research builds on the research that AASL is doing to insure high-quality library media programs that support the mission of ensuring that students and staff are effective users of ideas and information. It also builds on Farmer's research regarding the perceptions of school community members towards the AASL factors. The project also links to various research correlating information literacy standards and student achievement.

Methodology

The strategy for answering the research questions consisted of administering three assessment instruments to 72 ninth graders and 41 eleventh graders in an Orange County high school. The ninth grade classes were designated as gifted and talented, while the eleventh grade classes were not so designated. One instrument consisted of a research process rubric adapted from Colorado's and Grover's work on information literacy competency. A parallel rubric, measuring the quality of a research product, was also adapted from these sources and the American Association of School Librarians. The instruments were used and validated by the investigator for the Tamalpais Union High School District. The research product instrument was used to analysis sample student research reports as a cross-validation of student self-assessment of research information literacy competency. A third instrument measured student social-emotional behavior: Students' Foundation for Achievement and Social-Emotional Well-Being (Bernard and Laws), which has been validated for 10 to 17 year olds.

Specifically, at the beginning of a research project, four ninth grade classes (all with Teacher A) and two eleventh grade classes (both with Teacher B) self-completed the Students' Foundation for Achievement and Social-Emotional Well-Being Student Form (Bernard, 2003) and the Research Process Rubric (Tamalpais USD, 1999). At the end of the research project, the teacher completed the Research Product Rubric (Tamalpais USD, 1999).

The scores were coded and entered into an Excel spreadsheet. The process rubric was coded from 1 (emerging) to 4 (exceptional), and the product rubric was coded from 1 (unsatisfactory) to 6 (exceptional); these scores were treated as ordinal numbers. Grade level and gender were also coded and entered. A code number was generated for each student to link the three instruments while insuring confidentiality. The data were then imported into SPSS version 12 (2003).

Exploratory statistics were generated to reveal potential patterns. It was suspected that gender and grade might be significant factors, so additional tests were conducted.

Findings

Social-Emotional Well-Being

Before determining the degree of correlation between social-emotional well-being and research processes or products, the investigator examined patterns within this 25-factor set of measurements. Bernard (2003) statistically analyzed the 25 factors, dividing them into five distinguishing attributes: confidence (A1), persistence (A2), organization (A3), getting along (A4), emotional resilience (A5).
Initially, an independent samples T-test was conducted to these five attributes to determine if boys and girls represented the same population, which they did. When the data for the two grades were compared, it was found that ninth graders rated themselves significantly higher/more mature than eleventh grades for persistence (7.82 vs. 7.29 with .033 significance) and organization (8.16 vs. 7.51 with .026 significance),

which was entirely accounted for by the ninth grade girls' responses. Initial data analysis of the five attributes did not reveal enough differentiation, so individual factors were analyzed.

Gender

An independent samples T-test was conducted to determine if boys and girls represented the same population. For each gender as a whole, there was no difference in process and product. Three social-emotional factors were found to be significantly different:

- F11: I make sure I understand the teacher's instructions before beginning to work.
- F17: I listen and do not interrupt when someone else is speaking.
- F18: I am sensitive to the feelings of others and I volunteer to help others in need.

In each case, girls indicated that they exhibited these behaviors more than boys.

Factor	Girls' Mean	Boys' Mean	Significance*
11	8.10	6.47	.002
17	8.23	7.65	.018
18	8.60	6.58	.000

Correlation is significant at the 0.01 level (2-tailed) or significant at the 0.05 level (2-tailed) for this and the following tables.

When the data for the two grades were treated separately, results were different. Among the eleventh graders, there was no significant difference in social-emotional well-being factors. However, the girls exhibited significantly more mature behaviors than boys along seven factors:

- F6: I continue to try, even when schoolwork is hard.
- F11: I make sure I understand the teacher's instructions before beginning to work.
- F13: I write down assignments and when they have to be completed.
- F15: I am organized in doing schoolwork.
- F18: I am sensitive to the feelings of others and I volunteer to help others in need.
- F22: I am good at controlling my temper.

Factor	Girls' Mean	Boys' Mean	Significance
F6	8.53	7.26	.045
F11	8.50	6.94	.000
F13	8.39	5.53	.007
F15	8.37	6.76	.041
F18	8.53	7.15	.015
F22	7.68	6.76	.003

Research process behavior self-assessment and teacher-assessed research products were also analyzed using independent samples T-tests. In terms of gender, 11th grade girls out-performed boys in terms of adhering to the assignment (3.45 girls' mean vs. 3.16 boys' means with a .036 significance). Among the ninth graders, there was no significant difference in process or product.

To see if grade level made a difference in the findings about gender, independent samples T-tests were performed for boys and for girls. There was no significant difference between ninth grade boys and eleventh grade boys. Between ninth grade girls and eleventh grade girls there was no significant difference in social-emotional attributes, but in terms of products, ninth grade girls performed significantly better (correlation at the .01 level of confidence) for research product indicators. Additionally, they self-assessed their research process skills significantly higher (correlation at the .01 level of confidence) than eleventh grade girls in terms of:

- determining information need,
- developing search strategy,
- assessing an comprehending information, and
- interpreting and organizing information.

Grade

Seeing these results, the investigator used an independent samples T-test to determine if there was a significant difference between ninth graders and eleventh graders in terms of the measures of the three instruments.

The following individual social-emotional factor means differed significantly between the two grades:

- F1: I volunteer to participate in a new activity/experience.
- F6: I continue to try, even when schoolwork is hard.
- F7: I concentrate well when working.
- F9: I put in the effort necessary to complete difficult class and homework assignments.
- F10: I am persistent in doing schoolwork.
- F11: I make sure I understand the teacher's instructions before beginning to work.
- F17: I listen and do not interrupt when someone else is speaking.
- F19: I understand that by following important rules, I help make my world a safer and better place to live and learn.
- F20: I get along well with others.
- F24: When I get upset about something, I am good at being able to calm down quickly.

In each case, the ninth graders rated themselves more positively than the eleventh graders.

Factor	9th Graders' Mean	11th Graders' Mean	Significance
F1	6.68	5.41	.024
F6	7.93	7.22	.023
F7	7.28	6.44	.050
F9	7.96	7.05	.002
F10	8.22	7.10	.010
F11	7.76	6.59	.004
F17	8.25	7.46	.037
F19	8.20	7.49	.000
F20	8.42	8.20	.006
F24	6.72	6.34	.018

In terms of research processes, eleventh graders self-assessed their skill significantly higher than ninth graders for:

- Process 1: Determines information need
- Process 2: Develops search strategy
- Process 5: Interprets and organizes information.

Ninth graders self-assessed their skill significantly highly than eleventh graders for Process 7: Evaluates product and process.

Process	9th Graders' Mean	11th Graders' Mean	Significance
1	3.29	3.90	.011
2	3.31	4.00	.008
5	3.32	4.07	.012
7	3.31	2.95	.004

The teacher evaluated the students' work using the research product rubric. For three of the five target indicators, ninth graders outperformed eleventh graders to a significant degree:

- Indicator 1: Adherence to assignment
- Indicator 2: Organization
- Indicator 3: Proof and justification

Indicator	9th Graders' Mean	11th Graders' Mean	Significance
1	4.31	3.32	.046
2	4.64	3.10	.000
3	4.78	3.05	.001

Well-Being and Research

On the face of it, it appeared that older students were less mature, conducted research more effectively, and produced poorer research results. However, the differences in research product may be attributed to differences in the assignment and differences in the teachers' scoring of the product.

Thus, a follow-up Kendall Tau test was used to determine the degree of correlation between:

- social-emotional well-being and research processes,
- social-emotional well-being and research product, and
- research processes and research product.

First, the five social-emotional attributes were correlated to processes and product indicators.

There was a significant positive correlation between social-emotional well-being and the research process overall:

Attribute	Correlation Coefficient	Significance
Persistence	.141	.034
Getting along	.247	.000
Emotional Resilience	.175	.009

Among eleventh graders, the correlations were as follows:

Attribute	Correlation Coefficient	Significance
Persistence	.290	.012
Getting along	.300	.008

In contrast, the correlation between social-emotional well-being and the research process overall (using Kendall-tau test) generated these findings for ninth graders:

Attribute	Correlation Coefficient	Significance
Self-confidence	.256	.003
Persistence	.191	.024
Getting along	.307	.000
Emotional Resilience	.253	.003

Next, the seven research processes were analyzed separately to determine finer distinctions in the correlations. Overall findings were:

	Process 6: Communicate	Process 7: Evaluate
Attribute	**Correl. Coef. / Significance**	**Correl. Coef. / Significance**
Self-confidence	.297 /.001	.236 /.002
Persistence	.345 /.000	.273 /.000
Organization	.013 /.890	.225 /.003
Getting Along	.389 /.000	.231 /.002
Emotional Resilience	.315 /.001	.256 /.001

Grade level seemed to be a significant variable, so a follow-up Kendall's Tau test was used to analyze the data. For ninth graders, the results were:

	Self-confidence	Persistence	Organization	Getting Along	Emotional Resilience
Process Indicator	**Correl. Coef. / Signif.**	**Correl. Coef. / Signif.**	**Correl. Coef. / Signif.**	**Correl. Coef./ Signif.**	**Correl. Coef. / Signif.**
ID task	Not signif.	.205 / .027	NS	.206 / .026	.237 / .011
Strategize	NS	.188 / .044	NS	.215 / .021	NS
Comprehend	.330 / .000	NS	NS	.289 / .002	.217 / .019
Interpret	.268 / .004	NS	NS	.289 / .002	NS
Communicate	.203 / .031	NS	.240 / .009	.245 / .009	.236 / .012
Evaluate	.197 / .037	.244 / .010	.200 / .033	.228 / .016	.273 / .004

For eleventh graders, the results were:

	Persistence	Getting Along	Emotional Resilience
Process Indicator	**Correl. Coef. / Signif.**	**Correl. Coef./ Signif.**	**Correl. Coef. / Signif.**
Communicate	.332/.008	.287/.023	.284/024
Evaluate	.300 / .018	NS	NS

To determine if individual social-emotional behaviors correlated with research processes, follow-up Kendell tau tests were administered. The most highly correlated behaviors were:

- 1: Confidence: I volunteer to participate in a new activity/experience.
- 6: Persistence: I continue to try, even when schoolwork is hard.
- 8: Persistence: I check my work when finished to make sure it's correct.
- 9: Persistence: I put in the effort necessary to complete difficult class and homework assignments.
- 10: Persistence: I am persistent in doing schoolwork.
- 15: Organization: I am organized in doing schoolwork.
- 16: Getting along: I am good at working cooperatively with my classmates on projects. (only for eleventh graders)
- 23: Emotional resilience: When I get upset about something, I am good at being able to calm down quickly.
- 24: Emotional resilience: I am good at bouncing back from something that happens that upsets me.

Behavior	Overall	9th Grade	11th Grade	Girls	Boys
1	C6: .187/.016 C7: .273/.000		C7: .399/.002	C6: .227/.033 C7: .292/.007	C7: .245/.032

6	C6: .201/.011 C7: 209/.009		C6: .304/.021 C7: .276/.007		C6: .284/.014
8	C6: .183/.017 C7: .269/.001	C6: .197/.042 C7: .264/.007		C7: 258/.019	C7: .272/.016
9	C6: .227/.004 C7: .264/.001	C7: .249/.013	C6: .442/.001 C7: .262/.047	C7: .350/.002	C6: .345/.003
10	C6: .249/.002 C7: .239/.003		C6: .400/.002 C7: .285/.031	C7: .301/.007	C6: .316/.006
15	C6: .208/.008 C7: .273/.002	C6: .259/.009 C7: .272/.006		C7: .273/.015	C6: .233/.040 C7: .202/.023
16	C6: .270/.001		C6: .438/.001	C6: .293/.009	C6: .242/.036
23	C6: .300/.000 C7: .265/.001	C6: .226/.021 C7: .241/.014	C6: .426/.001 C7: .306/.020	C6: .352/.001 C7: .283/.010	C6: .275/.017 C7: .290/.011
24	C6: .266/.001 C7: .252/.001	C6: .271/.006 C7: .244/.013	C6: .263/.045 C7: .272/.038	C6: 221/.040	C6: .307/.007 C7: .288/.011

C6=Process 6: Communicate; C7=Process 7: Evaluate
(Correlation Coefficient / Significance in terms of level of confidence)

Next, to determine to what degree there was a correlation between social-emotional attributes and research product, a Kendall tau test was used. The attribute average in relationship to the research product average resulted in a .228 correlation coefficient (significance at the .020 level of confidence). By separate attributes in relationship to the research product average, only persistence was significantly correlated (.312 correlation coefficient with significance at the .01 level of confidence).

When the data were examined by grades, the differences emerged. For ninth graders, there was no significant correlation between:

- overall well-being and research product average, nor
- between any one attribute and research product average.

In contrast, for eleventh graders, the findings were as follows. The attribute average in relationship to the research product average resulted in a .275 correlation coefficient (significance at the .017 level of confidence). More specifically:

Research Product Indicator	Persistence	Getting Along	Emotional Resilience
Average	.242 / .036	.325 /.005	.247 /.033
Organization	.285 / .085	NS	NS
Proof & Justification	NS	.335 / .009	.338 / .007

(Correlation Coefficient / Significance in terms of level of confidence)

The most highly correlated research product indicator was proof /justification. Again, Kendall tau tests were used to determine to what degree correlations existed between individual social-emotional behaviors and research product indicators. It was found that examining correlations by gender and grade level was more informative than obtaining correlations for the entire population, particularly since each subgroup had unique correlations that crossed research product indicators. The most significant individual behaviors were:

Behavior	9th Graders	11th Graders	Girls	Boys
Confident meeting new people	D1: -.226/.017 D3: -.242/.012 D4: -.249/.011			
Check work when finished to make sure it's correct		D1: 304./.020 D2: .322/.014 D3: .297/.023		D1: .292/.008 D2: .290/.008 D3: .250/.018 D4: .234/.034
Put in effort needed to complete difficult assignments		D1: .344/.011		D1: .423/.000 D2: .280/.012 D3: .352/.001 D4: .378/.001 D5: .270/.015
Work cooperatively on projects	D2: -.278/.004 D3: -.280/.004	D2: .278/.039 D3: .340/.011 D4: .274./043		
Follow important rules for safety and have better world				D1: .231/.037 D2: .239/.031 D3: .324/.003 D4: .313/.005 D5: .310/005
Get along well with others	D1: -.245/.012 D3: -.283/.004 D4: -.271/.007	D1: .300/.026 D3: .340/.010	D2: -275/.012 D3: -231/.029 D4: 251/.020 D5: .236/.029	

D1: Adherence to Assignment; D2: Organization; D3: Proof & Justification; D4: Language & Strategy Use; D5: Spelling & Grammar
(Correlation Coefficient / Significance in terms of level of confidence)

However, the most surprising findings were with regard to the degree of correlation between the research process (which was self-assessed) and research product (which was assessed by the teacher). Overall, there was no significant difference between the research process and product average. However, when individual indicators were compared, the findings were significant for most:

Process Indicators	Adherence to Assignment	Organization	Proof & Justification	Language & Strategy Use	Spelling & Grammar
ID Task	-.257/.001	-.366/.000	-.341/.000	-.365/.000	-.361/.000
Strategize	-.333/.000	-.449/.000	-.422/.000	-.438/.000	-.411/.000
Locate	-.223/.000	-.277/.001	-.294/.000	-.273/.001	-.252/.002
Comprehend	-.352/.000	-.432/.000	-.433/.000	-.411/.000	-.408/.000
Interpret	-.308/.000	-.444/.000	-.452/.000	-.484/.000	-.462/.000
Communicate	NS	NS	NS	NS	NS
Evaluate	.190/.020	.261/.001	.272/.001	.210/.010	.251/.002

For ninth graders, there was a significant *negative* correlation between the process average and the product average: -.321 with .000 significance. More specifically:

Process Indicators	Adherence to Assignment	Organization	Proof & Justification	Language & Strategy Use	Spelling & Grammar
ID Task	-.210/.038	-.222/.029	-.220/.032	-.267/.010	-.249/.015
Strategize	-.251/.014	-.271/.008	-.281/.006	-.306/.003	-.244/.018
Locate	NS	-.224/.031	-.288/.005	-.261/.013	MS
Comprehend	-.363/.000	-.336/.001	-.396/.000	-.355/.001	-.333/.001
Interpret	-.215/.034	-.235/.021	-.286/.005	-.373/.000	-.322/.002
Communicate	-.213/.037	-.228/.007	-.251/.016	-.281/.007	NS
Evaluate	NS	NS	NS	NS	NS

In contrast, for eleventh graders, most correlations were either not significant or were positive:

Process Indicators	Adherence to Assignment	Organization	Proof & Justification	Language & Strategy Use	Spelling & Grammar
Communicate	.418/.003	NS	.467/.001	.337/.020	.333/.019
Evaluate	.341/.018	.559/.000	.570/.000	.506/.001	.337/.019

When gender was taken into effect, it was found that by and large, girls' scores accounted for the results, particularly for ninth grade girls (in contrast, for ninth grade boys the only significant correlation between process and product was Interpreting and Language/strategy use, which had a -.374 correlation coefficient and .016 significance).

Discussion

This study intended to answer the following research questions:

1) To what degree does a correlation exist between students' social-emotional behavior status and students' research information literacy competence?

2) To what degree does a correlation exist between students' social-emotional behavior status and students' research project quality?

It also examined the possible correlation between students' self-perceptions of their ability to follow a research process and teachers' perception of students' research products.

It was found that gender and grade made a significant difference in terms of self-perceptions and teachers' evaluations relative to these behaviors and products.

Instrumental Inner-correlations

Social-Emotional Well-Being. Before looking at the correlations, it was useful to examine students' self-perceptions about their social-emotional well-being. Ninth graders tended to rate their behaviors more highly, mainly for the attributes of persistence, organization, and getting along; in particular, ninth grade girls rated their behavior higher than their male peers as well as their eleventh grade female counterparts. The factors that were found to be significant followed the expected behavior styles of females: waiting to understand teachers' instructions, not interrupting, and being sensitive to others' feelings. However, by eleventh grade, boys' and girls' self-perceptions of behaviors did not differ significantly. When comparing *all* girls and *all* boys, though, girls self-reported more mature social-emotional behaviors in terms of trying hard, being organized, and self-regulating emotions. When these results are examined in

light of the students' research product as assessed by teachers, it appears that the study's eleventh graders self-assessed their behaviors more accurately and realistically than did the ninth graders. Since the ninth graders were designated as gifted and talented, they may have a elevated sense of well-being. Alternatively, eleventh graders may find their studies more challenging than in freshman year and so self-assess themselves less optimistically. If would be useful to have parallel classes to test this hypothesis.

Research Processes. In terms of research processes, eleventh graders self-assessed their skills significantly higher for the steps of determining information need, developing a search strategy, and interpreting/organizing information. Ninth graders that that they did a better job of evaluating product and process. Gender did not seem to be a significant factor in self-reporting of research processes, but between ninth grade and eleventh grade girls, ninth grade girls thought they were more capable in determining information needs, strategizing, comprehension, and interpretation of information. Again, ninth grade self-perceptions could have been accounted for by their gifted/talented designation, or it could be due to perceptions shaped by experience in high school courses that were more difficult and nuanced than middle school work.

Research Product. The ninth grade teacher assessed the students' research product significantly higher than the eleventh grader teacher relative to adherence to assignment, organization, and proof and justification. However, since the two assignments were different, is it difficult to determine the relative complexity of each aspect of the product let alone the teachers' differences in assessment. What *can* be examined, however, is the relative level of performance within each grade.

Social-Emotional Well-Being and Research Processes

A significant positive correlation was found between social-emotional attributes and self-perceptions about the ability to conduct research. Overall, getting along and emotional resilience were found to be significant at the .01 level of confidence, and persistence was found to be significant at the .05 level. The two research process indicators that correlated most closely with social-emotional well-being were communicating findings and evaluating the process / product; for the population as a whole, all attributes but organization *as a whole* were found to be significantly correlated positively at the .01 level of confidence. The subgroup that reflected the highest correlations for several of the attributes and processes was ninth grade girls. Overall, the data seem to indicate that research can be a frustrating process, so being able to deal with obstacles emotionally and intellectually, and to revise the work to a satisfactory conclusion, are important social-emotional skills across grades and gender.

Communicating the Information. Persistently putting in the effort to complete difficult work was a significant factor to communicating the information, particularly for eleventh grade boys. For ninth graders, being organized in doing schoolwork was also clearly correlated with communicating. For eleventh graders, working cooperatively with classmates on projects was another highly significant factor, particularly for girls. Being above to calm down quickly and bounce back when upset was significantly correlated for all subgroups.

Evaluating Product and Process. For eleventh graders, particularly girls, evaluating the research process and product correlated closely with risk-taking (willingness to participate in new activities and to try even when schoolwork is hard). Since girls in general are less likely to take risks, helping them develop this willingness will "pay off" in the research process. Checking work when finished to make sure it is correct appears to be more important for ninth graders. Being able to "bounce back" when upset is another significant factor, particularly for ninth graders.

Thus, teachers of ninth graders can help their students with basic study skills of organization and checking over completed schoolwork to make sure it is correct and adheres to the assignment. Teachers should also help students become more accurate in their self-evaluations by taking "reality checks" of their work habits, and reflecting on the impact of their behaviors to their final work. They can also help them with emotional skills of getting back on track when upset or frustrated. I-search research projects are

a good way to incorporate this kind of emotive-metacognitive approach to learning. For eleventh graders, teachers can help them take more intellectual risks and keep trying as part of a general strategy to aim for high-quality results.

Social-Emotional Well-Being and Research Products

The potential correlation between social-emotional well-being and research project is particularly interesting because it compares students' self-assessment of their personal behaviors and the teachers' assessment of their academic work. For this population, the most highly correlated research product indicator relative to social-emotional well-being was Proof and Justification.

For ninth grader, the behaviors that correlated negatively with research product indicators clustered around human relationships. Thus, those students who were more social tended to adhere less to the assignment, were less organized, had less substantial proof and justification, and exhibited less sophisticated language and search strategies. It could well be that they were distracted by their peers, or asked peers for advice rather than the teacher. Eleventh graders, on the other hand, leveraged their social skills to improve their research project.

For eleventh graders, persistence behaviors of checking over work correlated highly with adherence to assignments, and putting in the needed effort to complete difficult assignments related to organization, proof and justification, and use of language and strategies. Interestingly, these behaviors were positively correlated with the evaluation step of research processes for ninth graders, but they didn't translate into significant correlations with research product indicators. Still, the finding indicates that all high school teachers would do well to reinforce behaviors of persistence, revising, and checking final work to make sure all directions are followed.

There was one social-emotional behavior that boys exhibited that correlated significantly across all research product indicators: following rules. This finding would indicate that teachers should help boys in particular see the benefits of such behavior, that it has a good "pay off."

Research Processes and Products

It was anticipated that students who were competent in research processes would produce high-quality research projects. For eleventh graders, strong positive correlations exist between the research processes of communication and evaluation and research products. However, significantly *negative* correlations between research processes and products tended to apply to ninth graders. In a follow-up communication with the school library media teacher, these ninth graders tended to over-estimate their abilities. Indeed, the more highly they rated their research process expertise, the more likely that their work would be considered lower quality by their teachers. Thus, as mentioned before, teachers of ninth graders need to help them learn how to self-assess accurately by objectively linking their research behavior with their output *as they conduct research projects*. Since boys' behaviors tended to remain stable over the grades, particular attention needs to be made to ninth grade girls' self-perceptions. This finding aligns with Competency Theory as researched by Dunning, et al (2003). They posited that incompetent individuals do not self assess themselves accurately, and do not improve by seeing mod els of competency. They need to be explicitly taught the skills that render them competent.

Conclusions

This exploratory study examined students' social-emotional well-being, and its possible correlation with research processes and products. Because it is limited to one site, it can control to some extent school expectations, but the students studied in this investigation represent two different curricular "tracks," which limits comparisons. Additionally, having one teacher per grade also compromises the data. Still, the investigation unearthed some interesting patterns, and suggest some directions to take.

At the very least, this study shows the correlation between social-emotional well-being and information literacy: research processes and products. Basically, library media teachers and classroom teachers should pay attention to the social and emotional skills of students. Teachers need to explicitly address and teach skills of listening to assignments and checking work to make sure it adheres to the teachers' directions. Both library media teachers and classroom teachers should encourage students to persist in their research efforts; classroom teachers can emphasize the benefits of revising research questions, interpretation and manipulation of information, and communication of findings. Library media teachers can help students rethink key words, broaden their research strategies, and recycle the research process to refine questions and answers. Both classroom and library media teachers can help students by telling them frankly that conducting research can be a frustrating experience for students as well as information professionals, and that students should try to think of different approaches when they "hit the wall" and to keep on focusing on finding satisfying solutions to research questions.

On the positive side, the American Association of School Librarians included social skills (i.e., collaborative work) in their information literacy standards. What needs to be addressed, as revealed in this study, is the need for teachers to help students differentiate between social interaction and academically-centric collaboration. While it appears that this issue is resolved by eleventh grade, teachers can recognize freshmen's developmental behaviors and facilitate their actions to align more closely to academic demands. In addition, ninth grade teachers can help students think about how their behaviors impact their academic performance by using metacognitive exercises that concretely show the relationship between social-emotional behavior and research processes. This reality check can help students become more objective and accurate in their self-assessments. Peer review of these self-reflections can offer a socially acceptable and developmentally appropriate way to examine research efforts.

Particular attention should be made to gender-specific issues. For example, girls should be encouraged to take intellectual risks, and boys should be encourage to follow directions, both to the goal of producing more on-target and substantive work. These issues can be expressed to the entire class since the ones who need that particular encouragement can apply that information and those who already follow those ideas will be affirmed in their behavior.

This study raises several questions, which call for further research:

- How do different populations (gifted, average, at-risk) reflect different social-emotional well-being as well as research processes and products?
- Do other high schools exhibit similar behaviors and performances?
- How do other teachers assess research products; what roles can library media teachers play?
- Other theories of social-emotional well-being and self-determination should be examined (e.g., Wehmeyer) in light of research processes and products.
- What impact would interventions play, as noted above, in students' research processing and products?

In the final analysis, conducting research is an emotional and social process as much as it is an intellectual one. Therefore, library media and classroom teachers should pay attention to these dynamics in a pro-active way so students will be more successful in each of these developmental domains.

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State Level Digital Libraries Supporting K–12 in 2005

Politics and Policy

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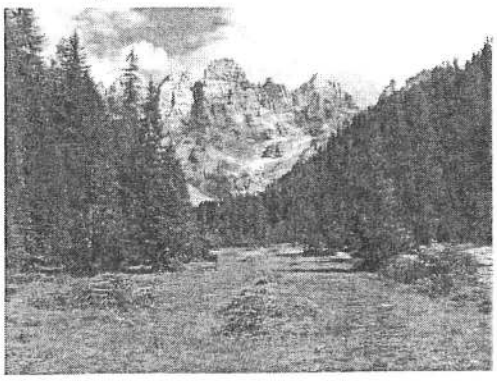

Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

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State Level Digital Libraries Supporting K–12 2005: Politics and Policy

The third survey of State Level Digital Libraries conducted during the summer of 2005 found them continuing to evolve. Sites in all fifty states were examined. Building on the 2004 census, the links to the agencies for the state library and the state department of education were also examined. The results demonstrate that new issues are emerging with perplexing implications for the future.

ssues

our conclusions were drawn from the first survey.

1. The sites examined lack an overall definition evidenced by the use of a variety of adjectives in their names; digital, virtual, or electronic.
2. Content in the sites was eclectic and not directly related to student outcomes, K–12 curriculum, or published guides of K–12 recommended Internet sites.
3. Sites were still the most cost effective manner to provide fee based content databases to K–12 students.
4. There is little evidence to demonstrate the relationship of the project to learning theory or to information literacy efforts. (Fuller, 2003, p. 51)

ver time, these conclusions change. Following the second survey, the second point was nended to note that the focus on content had sharpened, but still lacks a direct relationship to udent outcomes, state or national curricula, or published guides of K–12 recommended sites. uller, 2005, p. 27) In 2005, increased focus on quality online subscription databases continued ith 47 of 50 states providing these resources. The sites rely on the vendor to provide curricular nks and guidance to students and teachers. On the first point, the lack of definition is only oming from the preponderance of subscription based content to identify or recommend a site. he efforts to brand the site in a specific state are attached to marketing materials for the rticipating libraries. The state supported sites are still the best and most cost effective method providing fee based content databases to K–12 students. There were no improvements in tying e sites to learning theory, cognition, or information literacy efforts.

o this list another conclusion must be added; Politics and policy impact the content and the ility to sustain the project economically. The fifth conclusion underscores the fragile nature of e virtual library and other technology based initiatives. These initiatives have few tangible ssets and are completely dependent upon continued funding. Politics impact the budget dollars r these projects and the social policy of the incumbent elected officials impact the content of the tes.

he political lesson is underscored by the collapse of the Texas Library Connection (TLC). TLC ourished for eight years as a state-supported resource effort for K–12 schools in Texas. It was a odel for providing a union catalog and databases access, but as Mary Ann Bell described in her ticle in early 2005, the rumors about funding for the content databases proved to be true. The exas Legislature chose to eliminate the $4 million program in the name of budget shortfalls. hile parts of the program were adopted by other organizations, the heart of the project and the rt with an every day impact on Texas students, the databases, were lost. (Bell, 2005, p. 10)

vents in South Dakota in the summer of 2004 did not result in the termination of the state's cellent program, Teen Center, but in the termination of links to specific sites. Governor Mike ounds ordered the State Library to remove links in the Teen Center to Planned Parenthood eenwire.com) and Columbia University (Go Ask Alice). A letter from Bishop Robert Carlson of e Sioux Falls Catholic Diocese prompted the Governor's action. Both sites provided formation on sexual health and were removed by the State Library board. Further the Governor

ordered a 60-day review of the Teen Center site, effectively shutting it down. (McGaffrey, 2004, p. 18) As of this date, almost one year later, the "For Teens" section of the virtual library site is still "under construction." The action by an elected official demonstrated the speed at which policy decisions on social can have.

The example from South Dakota demonstrates the problem with free Internet resources. While there are many quality and respected sites, they still have to be vetted and approved internally. The quantity of free links in the state virtual library sites suggests that it is not possible to monitor the content and changes in those sites. Fee based subscription databases are presumed to be validated and included based on broad educational criteria. Single issue free Internet sites are will reflect their goals and objectives that may or may not match the goals and objectives for education in the state.

The political and policy news was not all negative. After losing their funding in 2003, the Oregon School Library Information System (OSLIS). OSLIS returned to life. The Oregon State Library and the Oregon Department of Education fund it. Oregon Educational Media Association (OEMA) spearheaded the drive and manages the site in partnership with the Information School at the University of Washington. (Students, 2005, August 31) The site emphasizes Information Literacy, Curriculum Standards, and Measurement, a departure from the trend of most state supported sites.

State	Name	Content DB	Grade Appropriate Portals	State Union Link	State Digital Project	Measurements	Advocacy	Literacy Skills	K-Yes2 Only	Multi type library
AL	AVL	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
AK	SLED	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes
AZ		No	No	No	No	No	No	No	No	No
AR	Traveler	Yes	No	Yes	Yes	Yes	No	No	No	No
CA	CLRN	No	No	No	Yes	No	No	No	Yes	No
CO	CVL	Yes	Yes	No	Yes	No	Yes	No	No	Yes
CT	ICONN	Yes	No	Yes	Yes	Yes	No	No	No	Yes
DE	DelAWARE	Yes	No	Yes	Yes	No	No	No	No	Yes
FL	FELibrary	Yes	Yes	No	Yes	No	No	No	No	Yes
GA	Galileo	Yes	Yes	No	No	Yes	No	No	No	Yes
HI		Yes	No	Yes	No	No	No	No	No	Yes
ID	LiLI	Yes	No	Yes	No	No	No	No	No	Yes
IL	Find-It Illinois	Yes	No	Yes	Yes	No	No	No	No	Yes
IN	INSPIRE	Yes	No	Yes	Yes	No	No	No	No	Yes
IA	SILO	Yes	No	Yes	Yes	No	No	No	No	Yes
KS	Blue Skyways	Yes	No	Yes	Yes	No	No	No	No	Yes
KY	KYVL	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes
LA	LCET	Yes	No	No	No	Yes	No	No	Yes	No
ME	MARVEL	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes
MD	SAILOR	Yes	No	No	Yes	Yes	No	No	Yes	Yes
MA	MBLC	Yes	No	Yes	Yes	Yes	No	No	No	Yes
MI	MEL	Yes	No	Yes	No	Yes	No	No	No	Yes

State	Name	Content DB	Grade Appropriate Portals	State Union Link	State Digital Project	Measurements	Advocacy	Literacy Skills	K-Yes2 Only	Multi type library
MN	MnLINK	Yes	No	Yes	No	Yes	No	Yes	No	Yes
MS	Magnolia	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes
MO	MORE	Yes	No	Yes	Yes	Yes	No	No	No	Yes
MT	MLN	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes
NE	Nebraskaccess	Yes	No	Yes	No	No	No	No	No	Yes
NV	CLAN	Yes	No	Yes	No	No	No	No	No	Yes
NH	NHewLink	Yes	No	No	No	Yes	Yes	No	No	Yes
NJ		Yes	Yes	No	No	No	No	No	No	Yes
NM		Yes	No	No	No	No	No	No	No	Yes
NY	NOVEL	Yes	No	No	No	Yes	Yes	No	No	Yes
NC	NC Live	Yes	No	Yes	No	No	Yes	No	No	Yes
NC	NC Wise OWL	Yes	Yes	No	No	No	No	Yes	Yes	No
ND	LaND	Yes	No	No	No	No	No	No	No	Yes
OH	INFOhio	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
OK	Dig Prairie	Yes	No	Yes	No	No	No	No	No	Yes
OR	OSLIS	Yes	Yes	No	No	Yes	No	Yes	Yes	No
PA	PowerLib	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes
RI	CLAN	Yes	No	Yes	No	No	No	No	No	Yes
SC	Discus	Yes	Yes	No	No	No	Yes	No	No	Yes
SD		Yes	Yes	Yes	No	No	No	No	No	Yes
TN	TEL	Yes	No	No	No	No	No	No	No	Yes
TX	TLC	No	No	No	No	No	No	No	No	No
UT	PIONEER	Yes	Yes	Yes	No	No	No	No	Yes	Yes
VT	VOL	Yes	No	Yes	No	No	No	No	No	Yes
VA	Find-It VA	Yes	No	No	No	No	No	No	No	Yes
WA	DLC Lib	Yes	No	No	No	No	No	Yes	Yes	No
WV		Yes	No	Yes	No	Yes	No	No	No	Yes
WI	BadgerLink	Yes	Yes	No	Yes	No	No	No	No	Yes
WY	GoWyld	Yes	No	Yes	No	Yes	No	No	No	Yes
Totals		48	17	29	19	21	9	7	9	42

High Level Comparisons

The inclusion of content databases was the most prevalent characteristic of all aspects of the various sites. This also follows that the sites are overwhelmingly sites serving multiple type libraries. It is the logical result of the initial focus of many of the sites, to act as buying consortia for libraries. The larger the groups to be served, deeper discounts were given by vendors. This continues to support the conclusion that the sites are the most cost effective method to provide these resources to K–12 students.

Given this conclusion, there are several anomalies in the states. It is logical to consider that the states would share as much as possible with each other, particularly in promoting the educational goals of the state. Florida is an interesting example to the contrary. The Florida Electronic Library (FEL) does not have a link from the Florida Department of Education (DOE). The Florida DOE does have links to the Library of Congress, the Internet Public Library and SunLink, a Union Catalog for K–12. FEL does have a link to SunLink, but not to the DOE. In North Carolina, NC Live supports public libraries and NC Wise Owl supports K–12 with online databases. They appear to overlap one another in their service to children and teenagers. A number of states make it a clear policy that school students are supported by the site dedicated to K–12.

Down side of the sites that serve K–12 in addition to higher education and public libraries, is the continued loss of grade and age appropriate portals for K–12. If leveraging the buying power of the large consortia to provide more resources to K–12, giving students more direction in what database to use is equally important. Only a little over a third of the sites do this. This has eroded from almost half of the sites in 2002. The sites most aligned with the goals of K–12 schools are the K–12 only sites, because their single purpose is creating efficient learning tools for students.

One content trend in 2005 is the emergence of the inclusion of statewide digitization projects, usually funded by the Institute for Museum and Library Services (IMLS). These sites typically provide digital images and information about the history of the state. While most states require some state history, they do not need images of primary source materials to fulfill the requirements. The problem is that the access is provided to a digital archive and not to a state union catalog. It underscores the conclusion that there is little relationship between the content provided and curricular goals and objectives.

Conclusion

The goal of having 100% of the states providing access to fee based content databases took a step closer in 2005, with the return of the OSLIS site. The four conclusions from the earlier surveys continued to be supported and a fifth emerged. Politics and policy impact the ability of the site to sustain itself and the content that it provides. The possibility of intervention from groups outside of the K–12 library community is a constant issue for the leaders of the sites to consider. The trend towards buying consortia serving multiple types of libraries has an impact on the access K–12 students have to the resources. These sites tend not to be well aligned with curriculum goals and student outcomes, including information literacy. Dedicated K–12 sites tend to provide better alignment with regard to those issues. The emergence of state level projects to create digital archives finds that more sites have these links than age and grade appropriate portals for K–12.

Politics is a way of achieving consensus to serve the public good. In the early part of the 21st century it has become the wielding of power to punish anyone who does not agree with a given point of view. Politics and applying a view narrow view of social policy created problems with the state supported virtual libraries in the past year. Others see what the Library and Information Science community see as a public good, as a threat to their view or social policy. It is a significant finding that may provide a clearer picture of the future for these sites than any other analysis.

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Appendix

K-12 Statewide Virtual Library Links

These URLs all relate to online database resources provided by states to K-12 students in the United States. Included in the listing for each state is a link to the department of education and the state library. Not all states provide these resources.

All links were tested and were active as of September 1, 2005.

Dan Fuller, Professor, School of Library and Information Science, San Jose State University compiled this list with assistance from SLIS students Michael Kaufmann and Dale David.

Alabama

AVL - Alabama Virtual Library
http://www.avl.lib.al.us/

Databases

Elementary School
http://www.avl.lib.al.us/databases/elem.html

Middle School
http://www.avl.lib.al.us/databases/middle.html

High School
http://www.avl.lib.al.us/databases/high.html

Higher Education
http://www.avl.lib.al.us/databases/college.html

General Public
http://www.avl.lib.al.us/databases/public.html

Alabama Department of Education
http://www.alsde.edu/html/home.asp

Alaska

SLED - Statewide Library Electronic Doorway
http://sled.alaska.edu/index.html

List of links to sites for K-12 Students
Pre-teens
http://sled.alaska.edu/kids.html

Teens
http://sled.alaska.edu/teen.html

Databases for Alaskans

http://www.library.state.ak.us/databases/home.html

Alaska Department of Education
http://www.eed.state.ak.us/

Arizona

Arizona Department of Education
List of Links for students K-12
http://www.ade.state.az.us/students/kids.asp

Arizona State Library, Archives, and Records
http://www.lib.az.us/

Arkansas

Arkansas State Library
http://www.asl.lib.ar.us/

Traveler - An LSTA project administered by the Arkansas State Library
http://www.asl.lib.ar.us/traveler/index.html

California

California Department of Education
http://www.cde.ca.gov/

California Learning Resources Network
http://www.clrn.org/home/
http://www.lessonplanbuilder.org/lessons/

California State Library
http://www.library.ca.gov/

California Digital Library
Public Version
http://www.californiadigitallibrary.org/

UC Student and Faculty Version - Higher Education
http://www.cdlib.org/

Colorado

Colorado Virtual Library
http://www.aclin.org/index.html

Colorado Department of Education
http://www.colorado.gov/education.htm

Colorado State Library
http://www.cde.state.co.us/index_library.htm

Connecticut

Icon - Connecticut Digital Library
http://www.iconn.org/

Connecticut State Department of Education
http://www.state.ct.us/sde/

Connecticut State Library
http://www.cslib.org/

Delaware

DelAWARE The Digital Library of the First State

http://www.state.lib.de.us/Collection_Development/Electronic_Resources/DelAWARE/

Delaware Department of Education
http://www.doe.state.de.us/

Delaware State Library

http://www.state.de.us/sos/dpa/collections/aghist/1420-001.shtml

Florida

Florida Electronic Library
http://www.flelibrary.org/

Florida Department of Education
http://www.fldoe.org/student/

Sunlink - Florida's K-12 Union Catalog
http://www.sunlink.ucf.edu/default2.html

State Library of Florida
http://dlis.dos.state.fl.us/stlib/

Georgia

GALILEO - GeorgiA LIbrary LEarning Online
http://www.galileo.usg.edu/

GALILEO - Kids
http://triton3.galib.uga.edu:80/cgi-bin/kidspage.cgi?nf=0

Georgia Department of Education
http://www.doe.k12.ga.us/

Georgia Public Library Service / Georgia's State Library Agency
http://www.georgialibraries.org/

Georgia Public Library Service - Kid's Page
http://www.georgialibraries.org/kids/

Hawaii

Hawaii's Public Schools
http://doe.k12.hi.us/

State Library of Hawaii
http://www.librarieshawaii.org/

Hawaii State Public Library System - Electronic Databases

http://www.state.hi.us/libraries/hsl/databases.html

Idaho

LiLI - Libraries Linking Idaho
http://www.lili.org/portal/

Idaho Department of Education
http://www.sde.state.id.us/Dept/

The Idaho State Library
http://www.lili.org/

Illinois

Find It! Illinois
http://www.finditillinois.org/

Illinois State Library

http://www.cyberdriveillinois.com/departments/library/

Illinois State Board of Education
http://www.isbe.state.il.us/

Alfy - Portal Kids Playground for teachers, parents and kids

http://www.alfy.com/index1.asp?FlashDetect=True

Indiana

INSPIRE - Indiana Virtual Library
http://www.inspire.net/index.html

INSPIRE - Indiana Virtual Library Kids' Links
http://www.inspire.net/inskid.html

Indiana Department of Education
http://ideanet.doe.state.in.us/

Indiana State Library
http://www.statelib.lib.in.us/

Iowa

SILO - State of Iowa Libraries Online
http://www.silo.lib.ia.us/for-ia-libraries/SILO/index.html

Databases for Iowans

http://www.silo.lib.ia.us/for_ia_libraries/databases/index.html

Iowa Department of Education
http://www.state.ia.us/educate/

Links PreK-12 Resources
https://www.edinfo.state.ia.us/web/links.asp?l=ed00000

State Library of Iowa
http://www.silo.lib.ia.us/index.html

Kansas

Blue Skyways - a service of the Kansas State Library
http://skyways.lib.ks.us/

KANFIND and KAN-ED Online Database Service
http://skyways.lib.ks.us/library/databases.html

Kansas State Department of Education
http://www.ksde.org/

Kansas State Library
http://skyways.lib.ks.us/KSL/

Kentucky

Kentucky Virtual Library - Kentucky's Information Source
http://www.kyvl.org/

KYVL For k-12 Schools
http://www.kyvl.org/html/k12/k12.shtml

Kids - Research Rocket
http://www.kyvl.org/html/kids/portal.html

Kentucky Department of Education
http://www.education.ky.gov/KDE/Default.htm
Kentucky Department of Library and Archives
http://www.kdla.ky.gov/

Louisiana

Louisiana Center for Educational Technology - K-12 Online Database Resources
http://www.doe.state.la.us/lde/lcet/328.html

Louisiana Department of Education
http://www.doe.state.la.us/lde/index.html

State Library of Louisiana
http://www.state.lib.la.us/

Louisiana Library Connection Databases
http://lalibcon.state.lib.la.us/

Maine

MARVEL! - Maine's Virtual Library
http://libraries.maine.edu/mainedatabases/
KIDS!

http://libraries.maine.edu/mainedatabases/kids.asp

Maine State Department of Education
http://www.state.me.us/education/

Maine State Library
http://www.maine.gov/msl/

Maryland

SAILOR - Maine's Public Information Network
http://www.sailor.lib.md.us/

Periodicals
http://www.sailor.lib.md.us/MD_topics/lib/_per.html

State Library Resource Center
http://pac.epfl.net/uhtbin/cgisirsi/0/0/x/55/30358/X/BLASTOFF

Maryland State Department of Education
http://www.marylandpublicschools.org/MSDE

State Library Resource Center / Central Library
http://www.epfl.net/slrc/

Massachusetts

Magazine and Newspaper Articles

http://mblc.state.ma.us/books/magazine/index.php

Massachusetts Board of Library Commissioners
http://www.mlin.lib.ma.us/flash3.html

Massachusetts Department of Education
http://www.doe.mass.edu/

Michigan

MeL - Michigan eLibrary
http://elibrary.mel.org/

Michigan Department of Education
http://www.michigan.gov/mde

Library of Michigan
http://www.michigan.gov/hal

Minnesota

WEB PALS
http://www.pals.msus.edu/webpals/

MNLink Gateway

http://gateway.mnlink.org/WebZ/Authorize?sessionid=0&bad=index.html&next=startscreen

Minnesota Department of Education

http://education.state.mn.us/html/mde_home.htm

Mississippi

MAGNOLIA: k-12
http://nt.library.msstate.edu/magnolia/

MAGNOLIA for Elementary Students
http://library.msstate.edu/magnolia/Elementary/

MAGNOLIA for Middle School Students

http://library.msstate.edu/magnolia/MiddleSchool/

MAGNOLIA for High School Students
http://library.msstate.edu/magnolia/Secondary/

Mississippi Department of Education
http://www.mde.k12.ms.us/

Mississippi Library Commission
http://www.mlc.lib.ms.us/

Missouri

MORE (Missouri Research and Education Network)
http://www.more.net/index.html

MORE Online databases
http://www.more.net/online/index.html

State Library Reference Services
http://www.sos.mo.gov/library/reference/Default.asp

KIDS!
http://www.sos.mo.gov/kids/

Missouri Department of Elementary and Secondary Education
http://www.dese.state.mo.us/

Missouri State Library
http://www.sos.mo.gov/library/

Montana

Montana Library Network
http://montanalibraries.org/

Montana State Library
http://msl.state.mt.us/

Library and Information Services Department
http://msl.state.mt.us/lisd/index.htm

Montana Office of Public Instruction
http://www.opi.state.mt.us/

Nebraska

Nebraska Access
http://www.nlc.state.ne.us/nebraskaccess/index.html

School K12
http://www.nlc.state.ne.us/nebraskaccess/school.html

Nebraska Library Commission
http://www.nlc.state.ne.us/

Electronic Library
http://www.nlc.state.ne.us/nsf/nel.html

Electronic Databases
http://www.nlc.state.ne.us/databases/

Kids Resource Pages
http://www.nlc.state.ne.us/libdev/kids.html#ap

Nebraska Department of Education
http://www.nde.state.ne.us/

Nevada

Nevada Department of Education
http://www.doe.nv.gov/

Nevada State Library and Archives
http://dmla.clan.lib.nv.us/docs/NSLA/

INFONEVADA
http://dmla.clan.lib.nv.us/infonevada.htm

Nevada Kids Page
http://dmla.clan.lib.nv.us/docs/kids/

CLAN - Cooperative Libraries Automated Network
http://www.clan.lib.nv.us/Polaris/

Library Services - Clark County School District Library Services
http://www.ccsd.net/schools/library/index.html

New Hampshire

Nhew Link - the Granite State's information Connection

http://www.nhewlink.state.nh.us/schools/databases.html

New Hampshire State Library
http://www.nh.gov/nhsl/

New Hampshire Department of Education
http://www.ed.state.nh.us/education/

New Jersey

Electronic Resources - New Jersey State Library
http://www.njstatelib.org/Electronic_Resources/

New Jersey State Library
http://www.njstatelib.org/index.php

JerseyCat - Statewide virtual catalog and interlibrary loan system
http://www.jerseycat.org/

New Jersey Department of Education
http://www.state.nj.us/education/

New Mexico

Magazines Online - New Mexico State Library

http://www.stlib.state.nm.us/services_more.php?id=203_0_13_0_M38

New Mexico State Library
http://www.stlib.state.nm.us/index.html

New Mexico Public Education Department
http://www.sde.state.nm.us/

New York

NOVEL - New York Online Virtual Electronic Catalog

http://unix2.nysed.gov/gate/esubject.htm#NOVEL

New York State Education Department
http://www.nysed.gov/

New York State Library
http://www.nysl.nysed.gov/index.html

North Carolina

NC LIVE - North Carolina Libraries for Virtual Education
http://www.nclive.org/

NC Wise Owl
http://www.ncwiseowl.org/

North Carolina Department of Public Instruction
http://www.ncpublicschools.org/

Student's Page
http://www.ncpublicschools.org/students.html

State Library of North Carolina
http://statelibrary.dcr.state.nc.us/

North Dakota

LaND (Online Library Resources)

http://ndsl.lib.state.nd.us/ElectronicResources.html#K12

North Dakota State Library
http://ndsl.lib.state.nd.us/

ODIN - Online Dakota Information Network
http://www.odin.nodak.edu/webpals/home.html

North Dakota Department of Public Instruction
http://www.dpi.state.nd.us/

Ohio

INFOhio - The Information Network for Ohio's Schools
http://www.infohio.org/

Ohio Department of Education
http://www.ode.state.oh.us/

State Library of Ohio
http://winslo.state.oh.us/

Ohio Public Library Information Network
http://www.oplin.lib.oh.us/

OPLIN Oh Kids!
http://www.oplin.lib.oh.us/ohkids/index.htm

Oh Teens!
http://www.oplin.lib.oh.us/teenhome.php

OhioLINK - Ohio Library and Information Network (Higher Ed and State Library)
http://www.ohiolink.edu/

Oklahoma

Oklahoma digital prairie - your electronic library
http://www.odl.state.ok.us/prairie/index.htm

ODL Online - Oklahoma Department of Libraries
http://www.odl.state.ok.us/index.html

Oklahoma State Department of Education
http://sde.state.ok.us/home/defaultie.html

Oregon

OSLIS (Oregon School Library Information System)
http://www.oslis.k12.or.us/index.php

Elementary OSLIS
http://www.oslis.k12.or.us/elementary/index.php

Middle and High School OSLIS
http://www.oslis.k12.or.us/secondary/index.php

Librarians & Teachers
http://www.oslis.k12.or.us/librarians/index.php

Oregon State Library
http://oregon.Gov/OSL/

Oregon Department of Education
http://www.ode.state.or.us/

Pennsylvania

ACCESS PA - The ACCESS Pennsylvania Database
http://www.accesspa.state.pa.us/

Power Library - Pennsylvania Online World of Electronic Resources

http://www.powerlibrary.org/Interface/POWER.asp

PDE - Pennsylvania Department of Education
http://www.pde.state.pa.us/

Commonwealth Libraries

http://www.statelibrary.state.pa.us/libraries/site/default.asp

Rhode Island

RILINK
http://www.rilink.org/

Rhode Island Department of Elementary and Secondary Education
http://www.ridoe.net/

Rhode Island Department of Elementary and Secondary Education - Students

http://www.ridoe.net/students/homeworklinks.htm

State of Rhode Island - Office of Library and Information Services
http://www.lori.ri.gov/

Find it! Rhode Island
http://www.find-it.state.ri.us/

South Carolina

discus - South Carolina's Virtual Library - K-12
http://www.state.sc.us/scsl/discus/school.html

discus - South Carolina's Virtual Library - Discus Kids
http://www.state.sc.us/scsl/discus/discuskids.html

Discus - South Carolina's Virtual Library
http://www.scdiscus.org/

South Carolina Department of Education
http://www.myscschools.com/

Know it all
http://www.knowitall.org/

South Carolina State Library
http://www.state.sc.us/scsl/

South Dakota

For Kids!
http://www.sdstatelibrary.com/forkids/

For Teens

http://www.sdstatelibrary.com/TeenCenter/index.htm

South Dakota Department of Education
http://www.state.sd.us/deca/

South Dakota State Library
http://www.sdstatelibrary.com/

Tennessee

TEL - Tennessee Electronic Library
http://www.state.tn.us/sos/statelib/tel/index.htm

Tennessee State Library and Archives
http://www.tennessee.gov/tsla/

Department of Education
http://www.state.tn.us/education/

Texas

Digital Knowledge Central - a virtual library
http://dkc.esc20.net/

Library of Texas
http://www.libraryoftexas.org/

Texas State Library and Archives
http://www.tsl.state.tx.us/

Texas Education Agency
http://www.tea.state.tx.us/

Utah

K-12 School's PIONEER
http://pioneer.uen.org/k12/index.jsp

Utah Education Network K-12
http://www.uen.org/k12student/

Public PIONEER - Utah's Online Library
http://pioneer.utah.gov/

State Library Division
http://library.utah.gov/

Utah State Office of Education
http://www.usoe.k12.ut.us/

Vermont

Vermont Department of Education
http://www.state.vt.us/educ/

VALS - Vermont Automated Libraries System
http://dol.state.vt.us/

VOL – Vermont Online Library
http://dol.state.vt.us/gopher_root5/libraries/schools/SLGUD04.HTM

Virginia

Find It Virginia
http://www.finditva.com/cgi-bin/main.cgi

http://www.teenspoint.org/

Virginia Department of Education
http://www.pen.k12.va.us/go/VDOE/

Kids Commonwealth

http://www.kidscommonwealth.virginia.gov/home/

Resources for Secondary Students

http://www.pen.k12.va.us/VDOE/Instruction/studentindex.html

The Library of Virginia
http://www.lva.lib.va.us/

Washington

Washington State Library
http://www.librarysmart.com/

Digital Learning Commons
http://depts11.u.washington.edu/lcommons/

DLC Library
http://www.learningcommons.org/students/library/

Office of Superintendent of Public Instruction
http://www.k12.wa.us/
State Library
http://www.secstate.wa.gov/library/

Kids and Students
http://www.librarysmart.com/working/LSPublic/02_kids.asp

Find It Washington
http://find-it.wa.gov/

West Virginia

Electronic Resources
http://librarycommission.lib.wv.us/E-resources.htm

West Virginia Library Commission
http://librarycommission.lib.wv.us/index.htm

West Virginia Department of Education
http://wvde.state.wv.us/

Wisconsin

Badger Link
http://www.badgerlink.net/

WISCAT - Online Catalog
http://www.wiscat.lib.wi.us/

Wisconsin Department of Public Instruction
http://www.dpi.state.wi.us/

Reference and Loan Library
http://www.dpi.state.wi.us/dltcl/rll/index.html

Libraries, Technology, and Community Learning
http://www.dpi.state.wi.us/dlcl/

Wyoming

GoWyld.net - Wyoming's Portal to Knowledge and Learning
http://gowyld.net/index.html

Wyoming Kids Sites
http://gowyld.net/wyoming/wykids.html

Online Databases
http://gowyld.net/dbases.html

Wyoming Department of Education
http://www.k12.wy.us/

Wyoming State Library
http://www-wsl.state.wy.us/

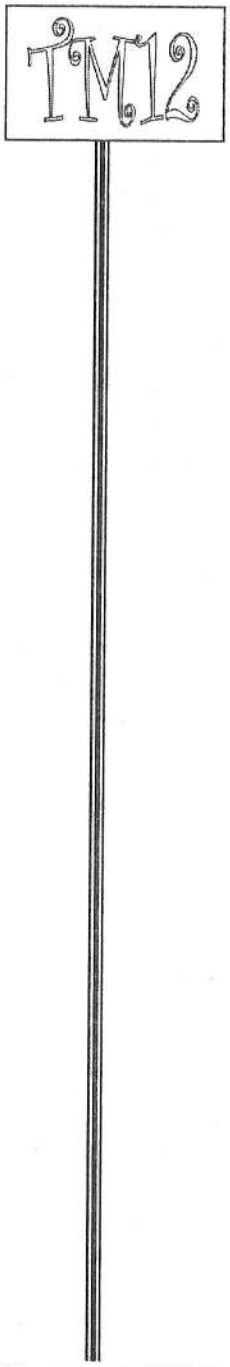
Other Links

To find a complete list of links to just the state libraries in the United States, use this link from the Library of Congress

http://www.loc.gov/global/library/statelib.html#r23

For a complete list of links to the various state departments of education in the United States use this link:

http://www.recruitingteachers.org/channels/clearinghouse/deptedu.asp



Thinking Globally, Acting Locally

Reflections on School and Public Library Collaborative Relationships in a Cross Cultural Context

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Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Introduction

International travel expands our personal knowledge of the world and spurs us to engage in deep reflection upon the state of affairs at home. This is a common occurrence for any thoughtful person who travels. Everyone thinks about home, with all its strengths and weaknesses, when experiencing a culture and language that is decidedly different; and this reflective process often results in significant personal and cognitive growth. Theorists speak of this phenomenon as transformational or experiential learning, a type of learning that is the result of individuals attempting to make meaning of new and strange experiences (Kolb, 1984; Mezirow, 1990). Transformational and experiential learning also occurs when visiting other countries to work collaboratively with professionals on projects of mutual interest. Research on global education indicates that cross-cultural professional experiences expand participants' interpersonal skills, content knowledge, and knowledge of world events. (Nava, 1990; Wilson, 1993; Wilson, 1982). Furthermore, according to Orndorff (1998) and Willard Holt (2001) even short term professional travel abroad results in meaningful and sometimes transformative experiences.

It is the purpose of this article to explore what it means to develop a global perspective as a professional in school librarianship, and to demonstrate how acquiring such a perspective makes a contribution to increasing professional knowledge and practice in library media education. As an example of how international experiences contribute to professional knowledge and practice in school librarianship, this article will describe how learning about the relationships between schools and public libraries in the autonomous region of Catalunya, Spain prompted me, as an educator of school librarians, to reflect on the status of the collaborative relationships between schools and public libraries in the U.S. and come to a new understanding of the issue from a global perspective.

I was one of two researchers from Western Kentucky University in Bowling Green who participated in a short term research project on developing an English language library for a private school in Spain. To gather background information on how school libraries functioned in Spain, we visited public and private schools throughout the autonomous region of Catalunya. We also toured a public library and talked with public librarians about services they provide to schools in their locale. Althoug we found the role of school libraries in the educational program of Catalunyan schools to be minimal or non existent compared with school libraries in the U.S., we also found that public libraries in Catalunya often played a vital and integral role in providing needed resources and reading appreciation programs to the schools in their area. The surprise of discovering the formal and informal collaborative relationships existing between school and public libraries in Catalunyan communities prompted me to engage in serious study and reflection on the state of collaborative relationships existing between these entities in the U.S.

Developing a Global Perspective

A series of research studies conducted over the past 40 years indicate that cross-cultural educational experiences may lead to developing an increased international understanding, cultural awareness, and professional competencies in a global setting Wilson (1993). According to Willard-Holt (2001) effects of international experiences on learners may include an increased value and sensitivity to cultural diversity, improved knowledge of other cultures, development of self-confidence and interpersonal communication skills, and a reduced tendency toward stereotyping individuals from other cultures. Most importantly for this article, the study found evidence that an international experience leads individuals to begin to consider themselves part of an international professional community with peers around the world (p. 21). Related studies of short term international experiences indicate that even short term educational trips abroad have a deep and lasting impact on the learner (Orndorff, 1998; Willard-Holt, 2001). In Orndorff's (1998) study of a short term study abroad program "participants increased cultural understanding and self-awareness, developed self-esteem and self-confidence, became more open minded, gained a

greater appreciation for their own country and culture, and developed new leadership skills" (p. 106). Although all of these personal and cognitive growth areas are important, in my own experience, the most transformative effect of our international experience in Spain was in the cognitive arena, resulting from a process of studying and comparing my own experience with school and public libraries in the U.S. to my study and observation of libraries in Spain, noting meaningful differences, and later engaging in reflection, study, and investigation of the issue.

The Status of School Libraries in Spain

In May of 2005, as professors in library media education from Western Kentucky University, my colleague and I visited the private K-12 school, Collegi SEK - Catalunya, in the town of La Garriga, Spain at the request of the school's English language program consultant. The goal of the visit was to develop a proposal for developing an English language library for the primary English program at the school. As part of our background research, we visited several public and private schools surrounding Barcelona.

Results of our preliminary literature reviews of school libraries in Spain indicate that school libraries are rare in both public and private schools throughout the country. When they do exist, neither are the libraries organized using standard classification schemes, nor do they play a formal role in the school's educational program (Gomez Hernandez, 2005; Gomez Hernadez & Pasadas Urena, 2003). According to a number of surveys done throughout Spain, school libraries have weak collection and circulation management and are not regularly staffed by trained library professionals (Salaberria, 2001). The tenuous status of school libraries in this country is primarily due to the fact that there are few school librarians working in Spanish schools and the function of school libraries as a resource center supporting the school curriculum is not well understood by education professionals (Baro, 2005). Our own observations in schools and libraries we visited in Catalunya confirmed these findings.

Knuth (1999) proposed a model for identifying different types of school libraries found internationally. In this model, types of schools libraries are placed on a spectrum ranging from a simple cabinet in a school classroom to a fully integrated school library media center. The school libraries observed on our visit could be placed somewhere in the middle of this spectrum, ranging from spare classrooms that function as book depositories for outdated classroom and professional development materials, to a dedicated room of fiction and non fiction titles maintained by a part time teacher-librarian. According to Knuth (1999), countries which do not provide funds or training for school librarians follow more of a British model which possesses the following characteristics: heavy involvement with public libraries that provide resources and programs, emphasis on recreational reading, and a textbook oriented educational system. The British model appears to be the one that best describes the schools we observed in Catalunya and helps the extensive school and public library collaborative relationships we discovered during our field observations.

School and Public Library Collaborations in Spain

According to Fitzgibbons (2001) school-public library collaborations can range from non existent, to informal, to formal relations and activities. The types of collaborative activities that can take place between these entities can also range from informal information and resource sharing, to collaboratively planned programs. Because schools in Spain do not have strong school libraries, perceived competition between school and public libraries for patrons is virtually non existent. The advantages to a model of school libraries that relies heavily on collaborating with public libraries is that resources and expertise can be shared and joint programs in reading appreciation and information literacy can be initiated making services to youth more effective in both institutions.

In Spain, public libraries have been the main provider of information resources and pleasure reading materials for P-12 students. Part of the formal mission of public libraries is to provide for the educational needs of youth (Salaberria, 2001). This mission is aligned with the International Federation of Library Associations (IFLA) *Guidelines for Public Library Services to Children* (n.d.) and the *IFLA/UNESCO Manifesto on Public Libraries* (2004). It is difficult to gauge the extent of school and public library collaborative relationships nationwide because research reports in this area are few and inconsistent. It appears from our observations in Catalunya that public libraries have developed a strong collaborative relationship with schools in Spain. Furthermore, according to Gomez Hernadez & Pasadas Urena (1993) public libraries in Spain have a long standing relationship providing materials and resources to support schools' academic missions. However, national studies reported by Salaberria (2001) do not support this assertion.

During our visit to Catlunya, we observed a range of collaborative activities between schools and public libraries. We toured two private schools, one public school, and one public library and spoke with a number of teachers, teacher-librarians, and public librarians about the relationship between schools and public libraries. The following sections describe the types of collaborative relationships and activities, ranging from informal resource and information sharing, to formal programming and resource networking relationships.

Formal Resource Sharing – St. Julia School

In the St. Julia School, a public rural primary school located in the Pyrenees mountain range, the public library plays an important and formal role in supporting this small rural school's academic program. The school serves a small number of primary grade students in multi-age and multi-grade classrooms. While the school's library collection is small, limited to about 1500 volumes, it is very broad, including titles in Catalan, Spanish and English, and organized using standard classification schemes for fiction and non fiction titles. One of the primary teachers at the school oversees the small collection and devotes one afternoon a week to maintaining the library. To supplement the need for resources to serve the school's multiage classrooms, the students use an online public access catalog to locate and request items from the public library located in nearby town of Berga. These items are delivered by a bookmobile to the school on a regular schedule. Along with requested items, the bookmobile also provides selections of titles for children to browse and take home for pleasure reading. The relationship between the St. Julia School and the Berga public library was the most formal example of school and public library collaboration we observed while in Catalunya, and demonstrated to us how a public library can enhance the school library collection and educational program by supplying resources and services that are beyond the means of the school to provide.

Informal Resource Sharing – La Garriga Public Library

Public libraries in Spain are the primary source for items students need for school projects that require additional resources beyond the information in the textbook. Students also use the public library for their recreational reading activities and Internet use. At the public library in La Garriga, a suburb of Barcelona, we learned through conversations with the public librarians on staff that students use the public library as the main resource for obtaining reading materials and information for school research projects. Support of the school's academic mission is not a formal process, but the relationship nonetheless appears to be very strong. Students and teachers in P-12 schools have unique library cards issued to them so that the public library can track usage and circulation statistics. Local teachers regularly schedule class visits to the library for bibliographic instruction or for specific instruction on finding resources related to a particular research project. The relations between the La Garriga public library and surrounding schools characterized the most informal school and public library collaborative relationships we observed and probably the

most typical kind of collaborative activity occurring between schools and public libraries on a daily basis in Spain.

Informal Resource Sharing and Joint Programming – Garbi School

At the time of our visit, the public libraries throughout Spain were providing promotional materials to schools on educational programs at various grade levels celebrating the 400th anniversary of Cervantes' classic, *Don Quixote*, as one of the many themes embodied in the nationwide celebration of the "2005 Year of the Book". In all the schools and libraries we visited there were posters and bookmarks celebrating this event. In the P-12 Garbi school located in the village of Espluges de Llogregat near Barcelona, the school and public library collaborated on a number of art and literature projects related to Don Quixote, including a poster contest, art projects, and student essays on a number of themes relating to the character and the novel. A series of educational programs using the novel as a theme were also held in the school. Teachers in the school presented the programs, but the educational materials were developed and created in collaboration with the public library located near the Garbi school. The public librarian and the literacy teacher at the school, who also managed the school's small library, coordinated these various activities. As the Garbi library did have a trained part-time teacher-librarian on staff, their small 3,000 volume library was heavily used by both the primary and secondary grades. The primary grades used the library for literacy and language arts activities, while the secondary grades used the library for locating and requesting resources from the public library via inter-library loan. The Garbi school's strong relationship with the local public library illustrates the extent of potential collaborative activities that are possible between school and public libraries when there is dedicated and motivated staff to carry out collaborative programs.

Reflections on Collaborative Relationships in the U.S.

Throughout my visit to Spain, during consultations with teachers, conversations with librarians, and tours of school and public libraries, I continued to reflect on the following question: why was collaboration between school and public libraries so strong in Spain compared with the collaborative relationships between these entities in the U.S.? The primary differences between school libraries in the two countries can be attributed to the fact that in Spain the development and implementation of school libraries is at the beginning stages, while in the U.S. school libraries are common and play an important role in the academic program of the school. There is advocacy for school libraries in Spain, and an acknowledgment of their importance by education leaders (Saleberria, 2001), but as yet, there are few well developed school libraries and even fewer school librarians. However, it is because Spanish schools lack libraries of their own--along with the resources they provide and the expertise of a professional librarian--that public libraries have a long standing and important relationship with schools in their locales. In Catalunya, we observed that collaboration occurs both informally and formally between the entities. Although this is also true in the U.S., a number of studies indicate that the collaborative relationship between our schools and public libraries is generally weak or non existent (Fitzgibbons, 2000). These studies identify the existence of a number of barriers hindering school and public library collaborative activities, including the lack of public policy and resources supporting collaboration, poor coordination and communication efforts between the entities, perceptions and attitudes of school and public library professionals, the institutions' divergent mission statements, and institutional competition (Fitzgibbons, 2000). However, generally speaking, school and public libraries in the U.S. have fewer barriers to overcome than those in Spain because school libraries are an integrated and accepted part of the school academic program and staffed by certified librarians. Certainly more effort on the part of librarians in both institutions could be made to work together and identify ways to collaborate both formally and informally, especially given the number of resources that can be shared via the Internet and ease of communication that email provides.

Conclusion and Recommendations from a Global Perspective

It wasn't until I traveled to Spain and saw how public libraries there supported the educational program of schools that I considered the lack of collaboration between school and public libraries in the U.S. to be a problem. Professional librarians in both countries assert that school and public libraries have shared roles and goals, and cooperative relationships between the two entities are an important component of student learning (Fitzgibbons, 2001; Saleberria, 1997). However, in the U.S., I have observed little collaboration between schools and public libraries, while in Spain I observed significant collaborative activities. The cognitive dissonance I encountered during my visit to Catalunya spurred me to reflect on my experiences and continue to research the subject further. This in turn, led me into new areas of knowledge related to collaboration, global education, and international comparative librarianship. The effect of my visit to Spain was indeed a significant and transformative experience, as described by researchers in global education (Nava, 1990; Orndorff, 1998; Wilson, 1993; Wilson, 1982), and will surely have a deep impact on my service to library media education students and the library profession.

I know that as a result of our visit to Spain my practice as an educator of school library media specialists has changed. Immediately on my return I developed a web site chronicling our work developing English language library classrooms with the Collegi Sek-Catalunya (http://edtech.wku.edu/~chouston/spain/elalc.htm). I have also strengthened the collaboration component in all of my library media education courses, emphasizing school and public library collaboration in addition to teacher and librarian collaboration. Most importantly of all, I have loosened my field requirements and now allow students to work in public library settings as well as school library settings, with the hopes that they will develop strong relationships with both institutions now and in the future. I am sure that had I not worked as a professional in Spain I would never have thought to explore school and public library collaborative relationships, nor would I have shared this information with my students. Now, however, because of my international experience, reflections, and consequent professional growth, I have developed a global perspective on the subject school and public library collaboration, increased my understanding of school libraries at home and abroad, and has significantly changed the way I approach the issue of collaboration with my students in Library Media Education.

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Examining Data From Multiple Perspectives

A Gestalt Approach to Library Information Science & Educational Research

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Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Introduction

> A man is not only a part of his field, he is also one among other men...Consider a group of South Sea Islanders engaged in some community occupation, or a group of children playing together. Only under very special circumstances does an "I" stand out alone (Wertheimer, 1924, p.4).

Although Wertheimer's words lack gender sensitivity, they are poignant to those of us who struggle to understand how children learn: This paper describes an ongoing research project that seeks to understand the instructional, technological, and social aspects of learning by focusing on the student as the central unit of analysis, and the school building, students' homes, and other "locations" as data collection points. The purpose of this paper will be to present highlights of a pilot study that was conducted in a rural K-12 school district and demonstrate how the results of that pilot have provided the foundation for the project's next stages. This project moves beyond basic summary descriptions of technology usage (who, what, where, when) by boldly asking *why* students use and access information and communication technology and *how* such technologies impact student learning. Additionally, by developing a collaborative team of researchers who represent different disciplines (library and information science, education, educational technology, sociology, research methodology, evaluative assessment, and educational administration) multiple lenses of perception can be simultaneously shared and exchanged continuously throughout the research process.

This research has important implications for school library research, as it not only examines student library usage within the school, but examines that usage within the context of *in-school* and *out-of-school* learning experiences. It is the students' out-of-school use that may provide educators with new ideas as to how to leverage the power of the Internet, and library services for learning. Although youngsters are very much "connected" and "turned on" by technology, there has been little research to date which examines the complexities and inter-connected relationships of students' in-school and out-of-school information technology engagement.

> Many schools and teachers have not yet recognized – much less responded to- the new ways students communicate and access information over the Internet. Students report that there is a substantial disconnect between how they use the Internet during the school day and under teacher direction. For the most part, students' use of the Internet occurs outside of the school day, outside of the school building, outside the direction of their teachers (Levin and Arafeh, 2002, p. 3).

It is difficult for many of us to imagine a time when the Internet did not figure prominently in our lives, and yet ten years ago only 14 percent of all Americans were online. In 1999, that number jumped to 50 percent, and by 2002 that number had increased to two thirds (Mindich, 2005). Teens especially are technology rich with 84% reporting owning at least one personal media device: a desktop or laptop computer, a cell phone or a Personal Digital Assistant (PDA) (Lenhart, Madden, and Hitlin, 2005, p. ii).
Lenhart, Madden, and Hitlin (2005) report that currently 87%, the vast majority of teens in the United States, use the Internet regularly. Not only has the teenage population grown up on the Web, but their use of the Internet has intensified:

- 81% of teen Internet users play online games (that number represents about 17 million people and a growth rate of 52% in the number of online gamers since 2000).

- 76% report getting their news online (that number represents about 16 million people and a growth of 38% in the number of teens getting news online since 2000).

- 43% report making online purchases (that number represents about 9 million people, and a growth of 71% in online teen shoppers since 2000).

- 31% use the Internet to get health information (that represents about 6 million people and signifies a growth of 47% in the number of teens using the Internet in this fashion since 2000) (Lenhart, Madden, Hitlin, 2005, p.i).

A New Media World

As the use of the Internet has become an essential element of American life, a growing number of Americans now vary their access points. The Pew Internet & American Life Project (Harwood and Rainie, 2004) found that 23% of American adults connect in places other than home or work. Within that group 27 % use the Internet at school, 26% use it at a friends' or neighbors' home, and 26% use it at libraries. There is no doubt of the pervasive nature of this technology, but understanding how technology shapes lives and how people shape technology are largely uncharted territories.

Young people have grown up in a very different media world than their parents and are accustomed to unlimited technology, usually in the form of entertainment, 24 hours a day (Mindich, 2005). It is impossible to understand how today's students learn without acknowledging the major impact technology has on all aspects their lives. Technology saturates the fabric of students' lives and determines how they live, learn, and play. As information scientists, sociologists, and educational researchers, we decided to begin to identify and carefully examine these technology threads and try to unravel the multifaceted relationship of technology and student learning. The K-12 school district discussed here in this pilot study, and the three districts that are currently engaged in the present study[1] all utilize ClassLink System 2000™, a technology which greatly facilitates the disentanglement of interconnected threads of technology. By studying technology usage in all places where students' media usage resides, this research begins to document not only the limitless aspects of learning anytime, anyplace, but more importantly, adds substance and depth to our now limited understanding of how media devices are changing the very foundations of childhood literacy.

The Skinny on Thin

ClassLink System 2000™ is a technology which enables the school districts to deliver curriculum software tools to their K-12 community 24 hours a day, 7 days a week, 12 months a year. Students can access the school's servers from any computer with an Internet connection. Since the software applications reside on centralized school servers, students are able to access the same set of technology tools and applications that are available to them within their classrooms, school library media centers, and labs. Even students who own legacy computers (older PCs and Apples) are able to access and use sophisticated software applications for once they are connected to the high speed district servers, they by-pass their own system's slower processors. Students are able to work when they want, and where they want on class projects, save their work remotely in their class folders; and have their assignments turned "in" to school before they themselves physically arrive. Thus, the traditional boundaries of where and when learning takes place are blurred and perhaps even erased.

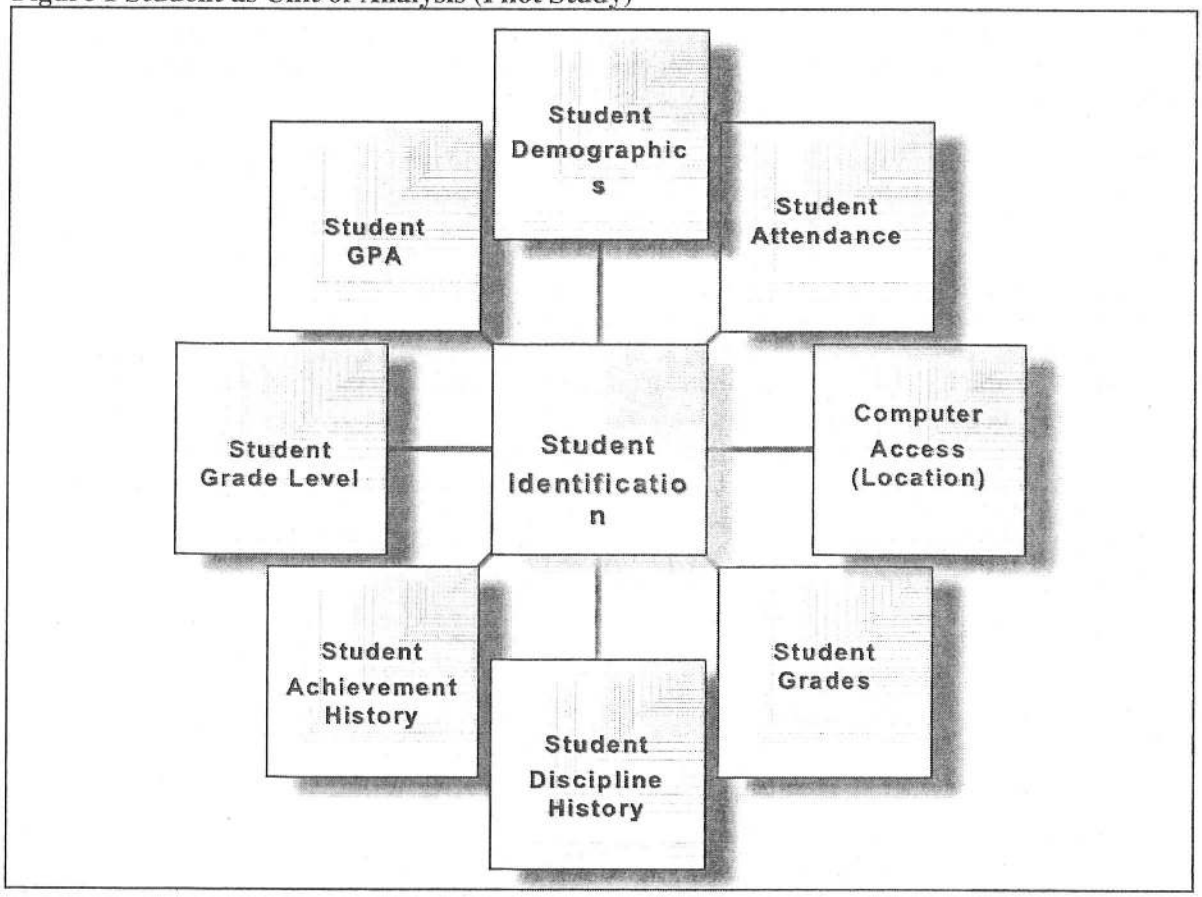
[1] Currently three additional school districts utilizing ClassLink System 2000™ have agreed to become partners in this project. These other districts represent an urban, a suburban, and a suburban-fringe/rural school district. At this time, the future suburban school district has already begun utilizing the survey instruments developed by the research team and administered in academic year 2004-2005 in the pilot district.

257

The Pilot Study – Identifying Who, What, When, & Where

A pilot study was conducted in 2002-2003[2], examining student technology usage on and off campus in one K-12 rural school district. The study's goal was to focus on students as the unit of analysis and to explore who was using technology, what type of technology was being used, when that technology was being used, and where the technology was being used both in-school, and out-of school. In addition, student usage data was juxtaposed against other student variables such as student background, student grades, student grade level, student attendance, and student discipline history (see Figure 1).

Figure 1 Student as Unit of Analysis (Pilot Study)



Utilizing the ClassLink System 2000™ system, we were able to capture statistical snapshots of technology usage each and every time any student accessed the school's server via ClassLink. We knew what software application(s) she used, what URLs she accessed, when she accessed the ClassLink system, and when she exited the system. The scope of the pilot study included:

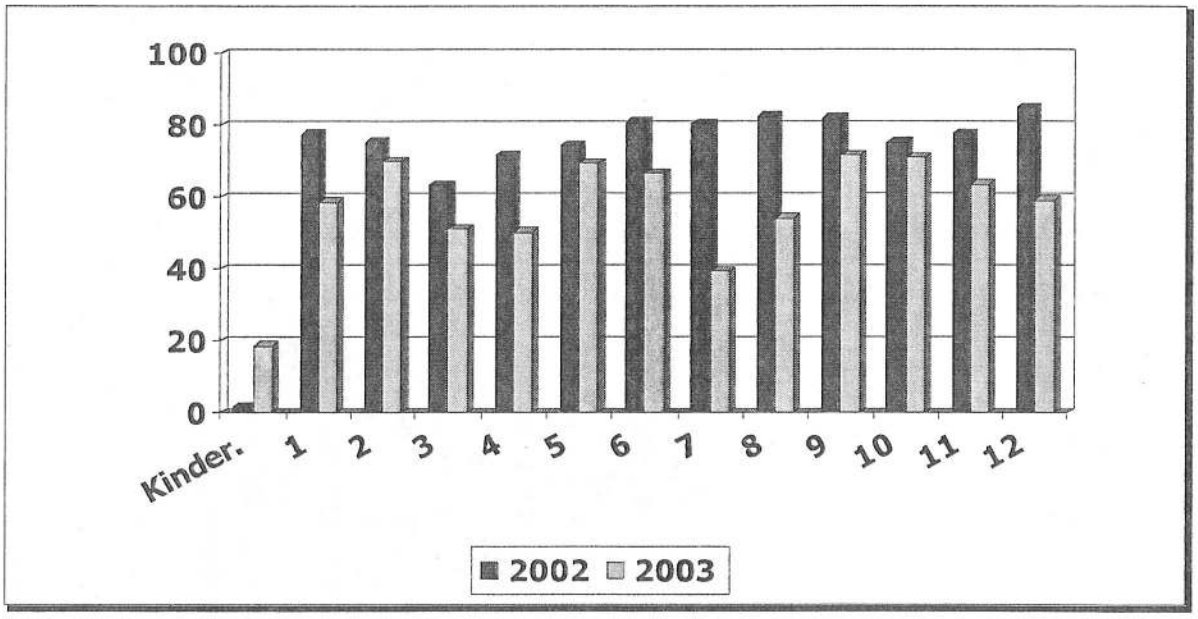
- Technology usage data in a rural K-12 school district
- Technology usage capture dates:
  November 19, 2002 – May 31, 2003 [limited to software applications]
  October 06, 2003 - March 01, 2004 [all software applications and all URLs accessed]

[2] The pilot study was conducted by Stefl-Mabry, J. and Wood, L. a doctoral student at the University at Albany, State University of New York during 2002 and 2003.

- 2,385 students
- Data analyzed at the individual and grade level
- Software applications accessed
- Online activity: URLS accessed
- Number of logons
- Date and time of logons
- Student demographics (gender, grade level, GPA, attendance, reduced or free lunch eligibility)
- Computer access locations (home, school, classroom, library, lab)

Millions of bits and bytes of student usage data was amassed during this time period and Figures 2 through 5 provide a few highlights of the who, what, when, and where's of student technology usage. For example, we were able to identify the percentage of users by each grade level (Figure 2); the top online (Web-based) applications used by each grade level, in this case 11th graders in 2002 (Figure 3); the number of all logons by students during the weekends; what time of day students were accessing the school server (Figure 4); and the number of online uses per person by gender (see Figure 5).

Figure 2 Percentages of Users by Grade (Pilot Study)



259

Figure 3 Top Online (Web-based) Applications Used by 11th graders in 2002 (Pilot Study)

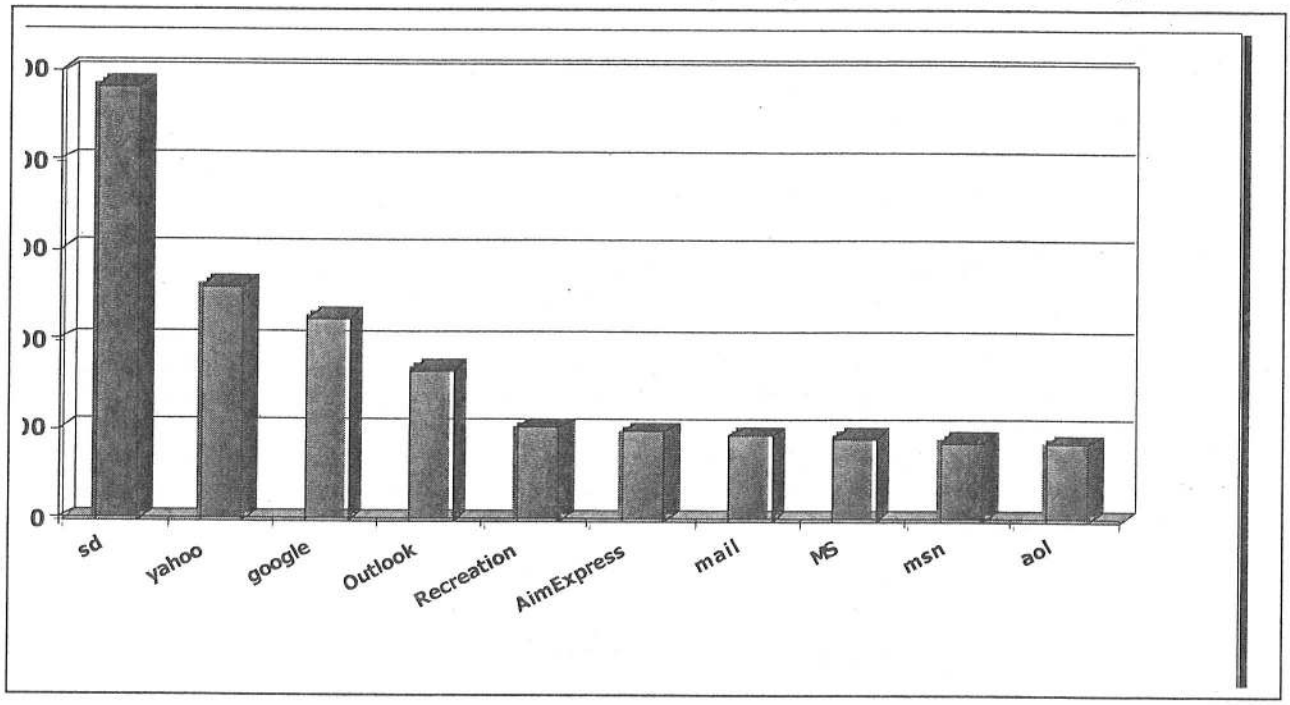


Figure 4 Student Logons by Hour Saturday and Sunday 2002 (Pilot Study)

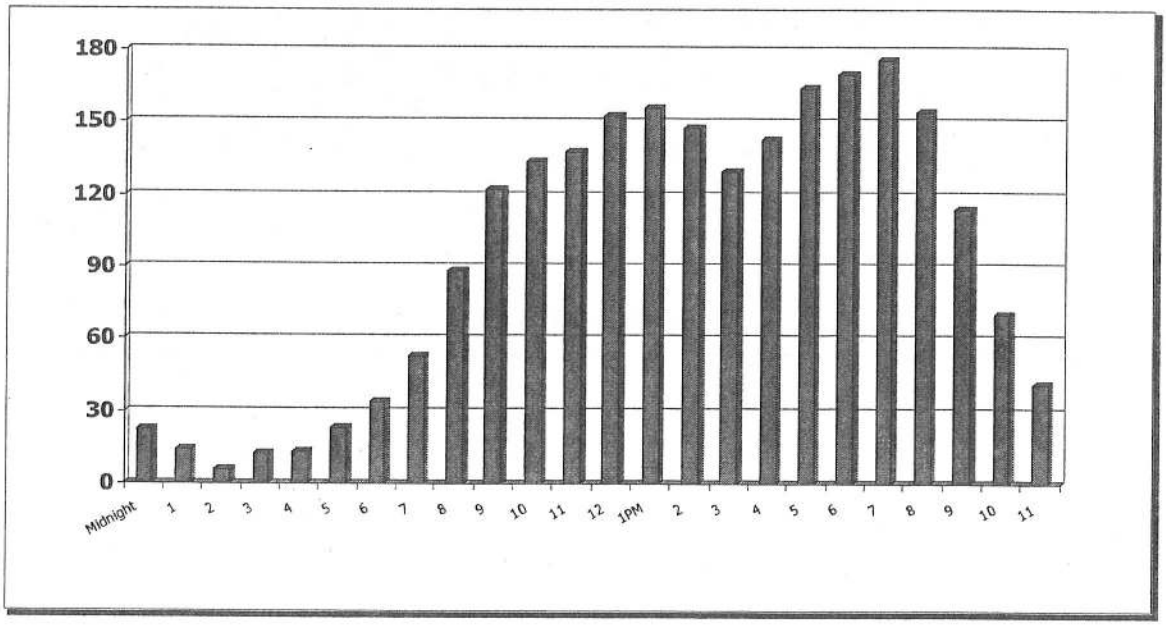
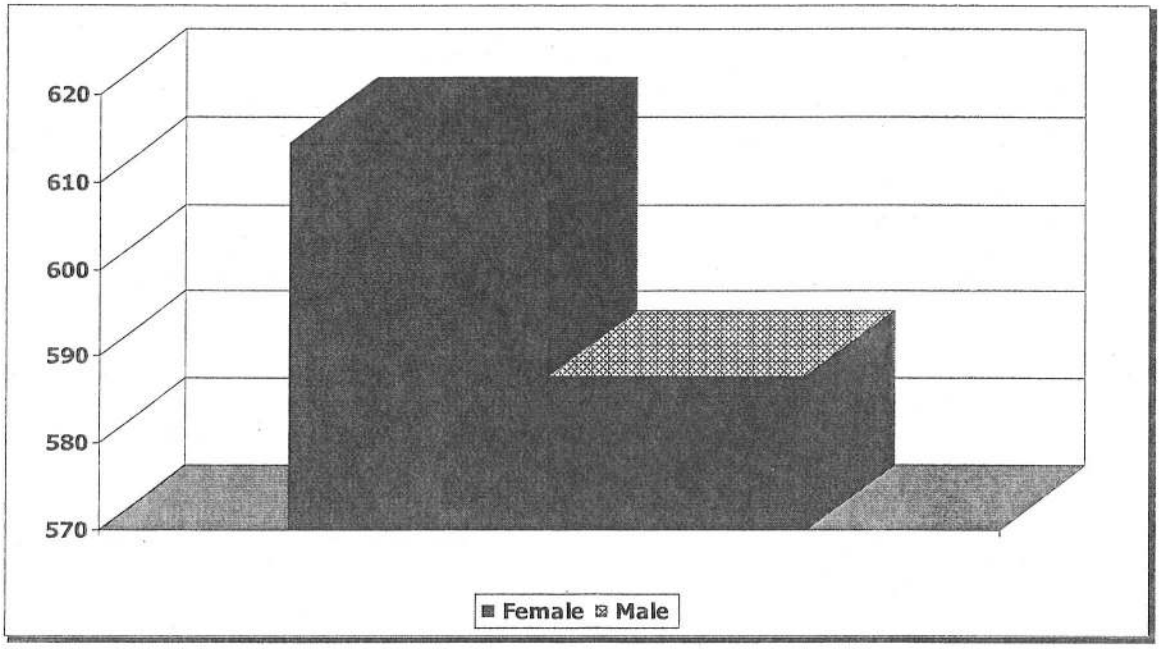


Figure 5 Online Uses per Person by Gender 2003 (Pilot Study)



While we were inordinately successful in identifying the *who* (via an anonymous student ID number), the *when* (time of day and date), the *what* (which software or online application was being used) and pretty much *where* (in-school vs. out-of-school, and even where within the school, although admittedly if the students were accessing ClassLink outside of school we could not determine *where* that *where* was), we still found ourselves no closer to understanding the *why*, *what*, or *how* students use technology then before the pilot began:

- *Why* were students using a particular technology? What prompted their usage of the technology? Was it related to curriculum, teacher pedagogy, social pressure (peers)?
- *What* were students doing with a particular application? What were they doing once they launched an application? Were they completing a class assignment, exploring self-interests, or fulfilling a social need
- *How* were students using the technology? As individuals? In groups? As a community? *How* did that particular technology contribute to or impact the student's performance?

The pilot study was however instrumental in helping us formulate the following research questions:

1. What is the amount of technology use in-school and out-of-school and what is the impact of this use on student outcome measures and assessments?
2. What are the patterns of technology use in-school and out-of-school (time, day, location, and applications)? How are they similar? How are they different? How do they evolve?
3. How are student, classroom, and school characteristics related to particular patterns of use?
4. Are there identifiable software application and Web application engagement patterns?
5. What is the relationship of technology usage with student achievement and other student outcome measures such as attendance and disciplinary referrals?

261

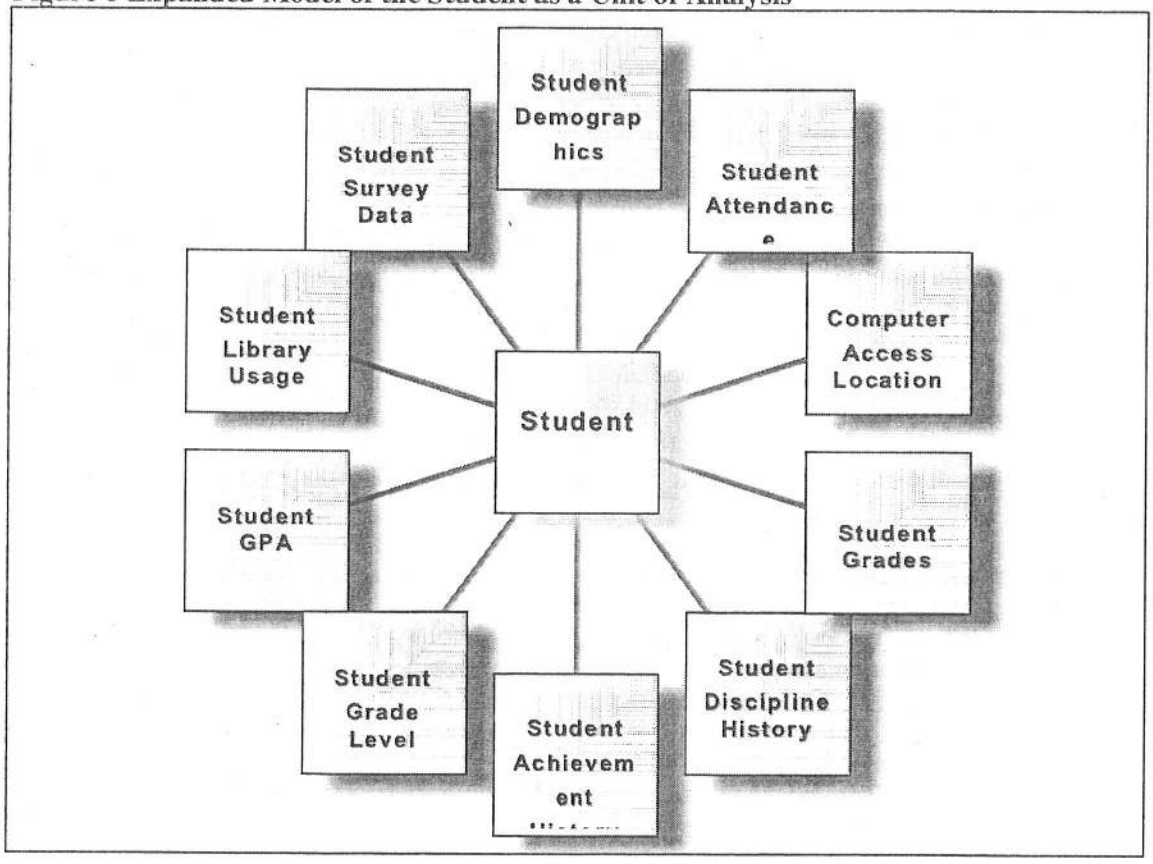
The pilot was also helpful in assisting the district articulate its own technology concerns:

1. What is the impact of technology usage on student learning?
2. What is the impact of technology usage on teaching?
3. Where is technology being used effectively?
4. How is "effectively" determined?
5. What types of technology are effective and for what purpose(s)?
6. How is technology expenditure justified?
7. How to ensure that teachers are using technology effectively in their classrooms?
8. What technology are students using in classrooms and for what types of activities? Homework? Classwork?

Thus, the results of the pilot study encouraged us to deepen our thinking about technology usage and prioritize the student as a "whole" over their "individual clicks". We need to view the child in her dynamic functional relationship to the whole from which it was lifted or we will never be able to understand her (Wertheimer, 1925).

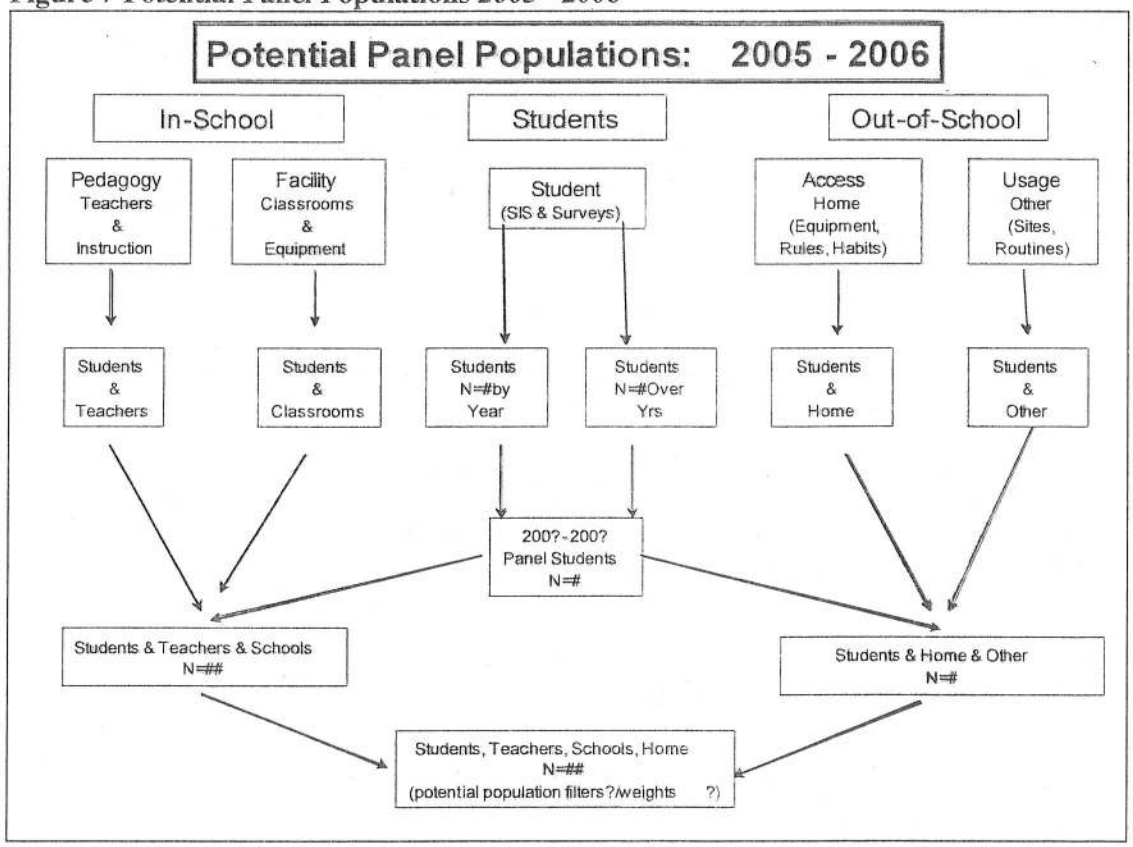
Based upon what was learned from the pilot study we expanded our original model, Figure 6 represents the new expansion:

Figure 6 Expanded Model of the Student as a Unit of Analysis



It is impossible to examine the student without considering the ecological environment surrounding that student. Figure 7 represents the possible panel populations that we will explore during the next stage of this project.

Figure 7 Potential Panel Populations 2005 - 2006



Next Steps: Embracing the Gestalt

We need to understand information technology and the multifaceted variables that impact student performance not as isolated independent variables but rather as an intricate enmeshed contributing part (negative and positive) of the child's environment. In the words of Wertheimer: "The programme to treat the organism as a part in a larger field necessitates the reformulation of the problem as to the relation between organism and environment" (1925). Although today's technologies provide us new and powerful ways to access greater amounts of information in less and less time "the world does not run on information: it runs on relationships" (Oblinger, 1997, p. 36).

A symbiotic view of the child reacting to and being reacted upon by the environment has led us to the next phase of our study. We are re-examining student usage statistics not in isolation, but as part of the context of "in-school", and "out-of-school" student "outcomes." This redesign has allowed us to build a unique research partnership that includes school and district personnel, university professors and researchers, state educational experts, and learning technology consultants along with technology innovators and developers. Our intention is to broaden our focus by utilizing a more complex research design via a mixed methods approach to gathering and interpreting data. This approach will allow us to conduct observations, surveys, interviews, focus groups and to collect archival as well as real-time data on student information technology usage, attitudes, expectations, and outcomes.

Understanding the basic fundamentals of youth technology usage-the *who*, the *what*, the *where*, and the *when* is fundamental but only begins to help build a foundation that will enable us to

263

understand actual student engagement - the *whys* and the *hows* endemic to our youths' media saturated lives. The pilot study has provided a basis on which to build our understanding of student technology usage but this is only the beginning of broadening our understanding of how technology impacts and is impacted by a youth media culture that does not stop (nor did it begin) at the school building. Harnessing this knowledge of how and why youth engage technology to broaden their lives and deepen their learning begins to provide educators with a glimpse into an integrated media saturated world and an opportunity for us to re-conceptualize how learning takes place.

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Understanding Cognitive Styles in the Library

Transforming Hypermedia and User Interfaces

Linda Swarlis

Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Introduction

Research results regarding cognitive styles are impacting learning in a variety of areas, but especially in transforming hypermedia learning and user interfaces for field-dependent (FD) learners. Psychologist Herman Witkin is credited with developing the terms field-dependent and field-independent while conducting research on the ability of individuals to orient themselves in space when the ground (field) can't be seen (Jonassen & Grabowski, 1993). Field-dependent individuals need to the field to orient themselves, field-independent individuals can orient themselves without seeing the field. Applied to learning situations, field-dependent (FD) learners are passive learners and are externally directed. They desire clear direction and structure and learn more globally. FD learners are usually more social, are more influenced by stress and are more appreciative of feedback than FI learners are more active learners, learn more through detail, prefer to direct their own learning, and are less influenced by social cues, external structure, and stress. Hypermedia is defined by Federico (2000) as "online settings where networks of multimedia nodes connected by links are used to present information and manage retrieval." The nodes can include a variety of presentations, texts, graphics, video, animations, models, simulations and visualizations that are available via a browser. The path through the nodes is determined by the user (Federico, 2000; Stanton, Correia & Dias, 2000; Lee, Cheng, Rai, Depickere, 2005). Cognitive styles are defined as "characteristic approaches of individuals in acquiring and organizing information" (Jonassen & Grabowski, 1993, p. 173). Cognitive psychologists created the term cognitive styles while conducting research in problem-solving, and in sensory and perceptual abilities (Sternberg & Grigorenko, 2001). Some research began with cognitive psychologists interested in differentiating between abilities and processes. Psychological research on cognitive styles is currently focused on perception, cognitive controls and cognitive process, mental imagery, and personality constructs (Riding & Raynor 1998). Cognitive styles are placed on a continuum that is bipolar, and one position on the continuum is not preferable to another, unlike ability continuums, which are unipolar and consist of set-points (Riding & Raynor, 1998). With the increase of educational opportunities available via web and computer-based learning, interest in the interaction between cognitive styles and hypermedia learning and design has increased. When cognitive style is matched with hypermedia design, hypermedia learning is most effective for learners, especially field-dependent learners. Two areas of psychology, cognition and personality, both of which are of interest to researchers in information science, converge in cognitive styles research.

Early theory described styles that were indistinguishable from abilities, and researchers were investigating styles in isolation. This led to the creation of many confusing labels for cognitive styles, a multitude of research models, and a variety of assessment tools. Sadler-Smith and Smith (2004) cite some of the research models from cognition-centered approaches, which include Witkin's perceptual functioning, field-dependence (FD) and field-independence (FI), Pask and Scott's holist and serialist thinking, Richardson's verbaliser-visualizer model, and Riding and Cheema's verbaliser-imager, wholist-analytic. To date, no unifying theory has been constructed to account for cognitive styles. Several researchers have attempted to connect the theories, but the connections and similarities are not supported by empirical evidence. Chen and Macredie (2002) reviewed the empirical research on hypermedia learning systems and through their examination of the research, introduced a new navigation model that recognizes needs of FI and FD learners. Parkinson, Redmond and Walsh (2004) created a user-centered design that accommodated field-dependent learners with apparent success; their research results suggest that the accommodations made for field-dependent learners do have a negative impact on learning for field-independent learners. See Appendix A, Table 1, Cognitive Styles Research of Significance to Hypermedia Design and Learning to view a table that compares the major research findings.

Difference between Cognitive Styles, Learning Styles and Thinking Styles

Cognitive styles are different from learning styles, although in some published research and in some databases, the terms are used interchangeably. The term individual differences is the overarching term for cognitive styles, learning styles, and thinking styles. For the purposes of this paper, the definitions developed by Riding and Rayner (1998) and Sternberg and Zhang (2001) will be used. Riding and Rayner (1998) classified learning styles into the following four groups: learning processes, orientation to study, instructional preferences, and cognitive skills. They view learning styles as the interface of individual differences with the learning process. Another definition of learning styles as used by Sternberg and Zhang (2001) is based on the way one prefers to learn. Also sometimes confused with cognitive styles are thinking styles. As defined by Sternberg and Zhang (2001), thinking styles are the ways in which one prefers to think about materials during or after the learning takes place. In contrast, cognitive styles are preferences regarding the approach to learning. Because of the confusion of terms and definitions, Desmedt and Valcke (2004) conducted a citation analysis through the *Social Science Citation Index* from 1972 to the present in order to see the highest ranking names of first authors, and to see which first authors were cited together for learning styles and cognitive styles.

Witkin's name heads Valke's list for three reasons. The first is that his field-dependence test has withstood empirical testing. It effectively determines field-independence, or one's ability to rely on an internal rather than external frame of reference. The research on FI and FD began within the Gesalt School of German psychology, which later developed into the theory of FI and FD. Witkin extended the research into FI and FD by researching the experiences of World War II pilots who flew through heavy clouds and were disoriented when they could not see the field or ground, and those who maintained their orientation despite not being able to observe the ground. The pilots who were disoriented were field dependent, and the pilots who were not disoriented were field-independent (Riding & Raynor, 1998).

The second reason his name is at the top of the list is that there is an active and continuing debate as to whether FI falls under the definition of a cognitive style. Assessments of cognitive style attempt to separate style from ability (Sternberg & Zhang, 2001). Two of the tests most often used are Witkin's test for field-independence, known as Group Embedded Figures Test (GEFT), and Riding's Cognitive Styles Analysis (CSA).

The third reason is that some form of Witkin's embedded figures test has been a standard in the field for a number of years. Its primary drawback is that it tests for field-independence and infers field-dependence by a low score in field-independence. Riding's Cognitive Styles Analysis tests for both field-dependence and field-independence. Cognitive Styles Analysis is sometimes considered to be a more accurate test, although there is some question about its validity. FI and FD have proven to be an area of critical importance for learners. Studies have shown repeatedly that field-dependent learners learn very differently than field-independent learners. In general, field-independent learners score higher in tests of fluid intelligence and spatial ability, but with adequate accommodations, field-dependent students can score as well in learning situations, especially learning situations that involve hypermedia.

Empirical tests have shown a correlation between spatial ability, intelligence, and field-independence. Cognitive styles are considered to be on a continuum, all with equal validity, unlike intelligence where a higher score is preferable to a lower score. Miyake, Witzki, and Emerson (2001) cite McKenna's (1984) research on the correlation between field-independence and ability and suggest a statistically significant correlation between spatial visualization ability and fluid intelligence. MacLeod, Jackson and Palmer (1986) also demonstrate a correlation between the Rod and Frame Test and the Embedded Figures Test to a test of spatial ability using the Space Relations Test and the Block Design Test. Miyake, Witzki and Emerson (2001) cite the MacLeod, Jackson and Palmer (1986) results in a research study to explore the connection of working memory to field-independence. One of their hypotheses is that the capacity of the visual buffer or the visuospatial sketchpad and the efficiency of the central executive function cause variations in performance on spatial tests. Miyake, Witziki & Emerson (2001) suggest that field-dependence and field-independence be considered a cognitive ability rather than a style because their

research suggests that the efficiency of working memory, especially the visuospatial and executive components, determines the results of tests on field-independence and field-dependence. The visuospatial component (the visuospatial sketchpad) seems to maintain visual memory, while the central executive monitors and tracks changes in the visual memory. Different scores on field-dependence and field-independence will occur because individuals differ in visuospatial capacity and efficiency of the central executive component (Miyake, Witziki & Emerson 2001). The working memory and central executive components are two of the dimensions of visual memory influencing research on cognitive styles.

Impact of Cognitive Style on Hypermedia Learning and Design

Another visual dimension of cognitive styles is making an impact on hypermedia design.
Chen and Macredie (2002) reviewed the empirical research on hypermedia learning systems; through their examination of the research they introduced a new navigation model that recognizes needs of field-dependent and field-independent learners. Chen and Macredie (2002) address five areas of hypermedia research for field-dependent and field-independent learners in their article: nonlinear learning, learner control, navigation in hyperspace, matching and mismatching, and learning effectiveness. Based on an examination of empirical studies, the authors suggest that the preference of field-independent students is to learn in a nonlinear way in the hypermedia environment. Field-independent learners also use the index, find, or other navigational tools to navigate. Field-dependent students experience confusion when the information is not presented linearly and prefer more structure in the presentation of information. Also, field-dependent learners prefer a map, prefer to work with a clear structure in place, and frequently use home or backward/forward keys to reorient themselves. The authors present a new model for the design of hypermedia navigational systems that considers learning preferences; they also suggest strategies for maximizing effectiveness for field-dependent and field-independent learners.

Their literature review was comprehensive, although there were few references from current journals of psychological research. Each area addressed is supported by empirical studies, and is balanced in the reporting of results. In some areas no results were observed when alterations were made in hypermedia design. For example, the research review shows that learner control has no significant impact on learning and the authors suggest areas for further research. Conversely, the research does show that nonlinear learning increases confusion for field-dependent learners and that their confusion can be alleviated by incorporating some of the research findings in system design. However, some research studies have found a relationship between intelligence and field-dependence and field-independence. These research findings and similar research findings were not discussed or mentioned in this article. Sternberg and Grigorenko (2001) mention a review of 20 research studies by Goldstein and Blackman (1978) that suggest that field-independence has a moderate correlation with verbal and performance intelligence. The MacLeod, Jackson, and Palmer (1986) study also suggested a statistically significant relationship of field-independence with spatial ability. Neither of these research findings was mentioned in the review of current empirical research by Chen and Macredie (2002). While the focus of the review was current empirical research, the debate about field-dependence or field-independence was not acknowledged. From the perspective of the hypermedia learning system designer or instructor, the question of intelligence may not be important. If the goal is to have the information processed in the most efficient and effective way by the user, then applicable research results on field-dependence and field-independence need to be taken into consideration during user interface design since it would be nearly impossible to restrict any system to only FI or only to FD learners. The suggestions that the authors propose, and the table of learner characteristics provided in the article, can help in system design.

In another area of research, Ford, Wilson, Foster and Ellis's (2002) study examined Gordon Pask's (1976) serialist and holist cognitive styles which are similar to FI and FD. Pask developed the holist and serialist categories to explain some of the cognitive style differences that he saw in his research. He described holists as using a global approach: the holists saw the big picture first and filled in the details later. The holists move between theory and real world with ease, and the holist approach to learning creates description building and learning comprehensively. In building a description, the holist creates a mental map of the concept and fits the details into the map. Holists rely on comprehension more than

memorization. Pask also found a correlation between divergent thinkers and holist thinkers. Divergent thinkers tend to be more creative and make connections across broad areas. Ford, et al. (2002) cite research findings by Ellis, Ford and Wood (1992) who used the Study Processes Questionnaire and found that the navigation of serialists differed from holists in a hypertext environment. Holists use the concept map for comprehending their location in the global context of the structure of the material. In contrast, serialists must comprehend the details before they can create the big picture and they have a difficult time with ambiguity. Another term that Pask used with serialist was procedure building, i.e. the fine detail of how things work operationally. Serialists cannot build a cognitive map for their learning until they understand the details fully. Pask also called them operational learners. Serialists are unable to meld theory into real world practice until very late in their learning and they can be distracted by irrelevant information. Serialists also tend to rely more on memorization than comprehension. Convergent thinkers use a serialist approach to tasks and utilize logic to construct new understandings in a sequential way. In a hypertext environment, serialists make use of the keyword index for navigation. Although versatile learners can employ both strategies to learn, even versatile learners have their preferences for learning serially or holistically. At the extreme end of holist learners are the learners who cannot move beyond the superficial global concept into understanding details, something that Pask calls *globetrotting*. At the extreme other end of the spectrum is the serialist learner who gets caught in the details and can't seem to form the big picture. For these learners, Pask (1976) coins the term *improvidence* (Ford, Miller and Moss, 2001). The research of Ford, et al. (2001) on serialists and holists presents evidence of empirical evidence to support the idea that holist learners are deep learners and that serialists' approach to operation learning is a more superficial type of learning. The authors also recommend further research on the impact of cognitive styles on serialist and holist search processes and information seeking skills.

The similarities between Witkin's field-dependent and field-independent cognitive styles and the wholist-analytic styles of Riding and others have been noted, but no empirical evidence exists to connect the two styles. In previous tests, field-dependence was derived from an absence of strength in field-independence. The Cognitive Styles Analysis developed by Riding circumvents the problem by testing directly for both field-dependence and field-independence. Moving beyond field-dependence, many recent studies have been published on visual memory; one of the most fascinating is on two kinds of visual memory, high spatial and low spatial, and their impact on learning.

A highly intriguing research study suggests a revision of the visualizer-verbalizer dichotomy. This dichotomy predicates that verbalizers process information through verbal means and visualizers process information via visual means. Kozhevnikov, Hegarty & Mayer (2002) have found evidence of two kinds of visualizers; visualizers with high spatial ability and visualizers with low spatial ability. The visualizers with low spatial ability can construct detailed visual images of objects while visualizers with high spatial ability can manipulate spatial images and visualize spatial relationships between objects. The authors call visualizers with low spatial ability the iconic type and visualizers with high spatial ability the spatial type. Research into visualizers involves research into working memory, the exploration of the central executive, a phonological loop for the processing of verbal information, and the visuospatial sketchpad for processing visual-spatial information. Kozhevnikov, Hegarty and Mayer (2002) cite a study by Krutetskii (1976) that examined visual spatial relationships in which he found that people process mathematical problems differently. The results of the study suggest that while some groups solve problems geometrically (through visual methods), some solve them analytically through verbal-logical methods, and a third group solves them using language and imaging methods equally.

In differentiating between two types of visualizers, Kozhevnikov, Hegarty and Mayer (2002) were able to account for some of the inconsistencies in prior research. Only a few researchers had differentiated between different types of spatial abilities when reporting their results. Kozhevnikov, Hegarty and Mayer (2002) point to research by Casey, Winner, Brabeck and Sullivan (1990) that shows engineers, physicists, and mathematicians having high levels of spatial ability. Visual artists have lower average spatial ability, but score higher in comparison on visual memory tests. The implications for research are intriguing. For example, the authors suggest that students with low spatial ability may need additional support in interpreting graphs because they interpret them literally, as pictures of actual movement rather than as

representations of abstract ideas. The results suggest that there is a need for further research in the use of imaging in designing instructional strategies.

Parkinson, Redmond and Walsh (2004) conducted research to develop strategies to accommodate field-dependent learners. The authors redesigned instructional materials for both a text-based and a web-based course. When the design included more cues, a well-defined structure, learning maps, positive feedback, and topic headings, and included less text and fewer graphics per page, the field-dependent learners were better able to recognize salient information and process it more effectively. The design adaptations allowed field-dependent learners to perform as well as field-independent learners in both text and web environments. In a similar study, Redmond, Walsh and Parkinson (2003) investigated accommodations for field-dependence/field-independence, verbaliser-imager (Riding) and wholist-analytic (Riding). In prior studies, when no accommodations were made for FD learners, FI learners outperformed FD learners. The results for wholist-analytic learners were not as clear. Their scores for both text and web-based courses could not be predicted. However, verbalisers outperformed imagers in both text and web-based courses, despite additional accommodations for imagers.

Research Potential

Parkinson, Redmond and Walsh (2004) question the validity of the Cognitive Styles Analysis in determining verbaliser/imager styles. Their results appear to support the research done by Kozhevnikov, Hegarty and Mayer (2002) in which the authors call for a revision of the visualizer dimension to differentiate learners with high spatial ability (spatial) and low spatial ability (iconic). Applying this differentiation of iconic and spatial abilities, to other research studies may give clarity to research results that had previously been inconclusive or inconsistent. It would be interesting to see how many of the inconclusive research results could become statistically significant with a differentiation between the two kinds of visual memory.

Field-dependent learners and field-independent learners process information and learn differently. Although field-dependence and field-independence have been heavily researched, their application to hypermedia design and learning are not as well-researched. Despite the debate on the question of field-independence and field-dependence as a style or ability, research has shown that, with accommodations, field-dependent learners can learn as well as field-independent learners. Still remaining is the question of designing systems with accommodations that will work for both field-dependent and field-independent learners equally well.

Since FD and FI individuals learn differently in a hypermedia environment, it might follow that their methods of information retrieval are as varied as their view of the relevance of the results. Since FD learners are more global learners, are they satisfied with less than complete results due to their more superficial grasp of the research? Do FI learners go too far in the other direction, getting bogged down in minutia, and losing the global picture because they encounter too many details? What strategies would work best in designing useful user interfaces and guiding users through the information seeking process in an online environment?

Conclusion

Applying cognitive styles research, especially in the areas of information seeking, hypermedia learning, and user interface design has the potential to transform learning and information seeking for a new generation of students, especially for the FD learner. Instructors and designers can utilize the research results for more effective teaching and learning strategies for all students.

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Table 1: Cognitive Style Research of Significance for Hypermedia Design and Hypermedia Learning

Name	Field Independent(FI)/ Field Dependent (FD)	Serialist/ Holist	Verbaliser/ Visualizer	Verbaliser/Imager Wholist/Analytic	Visualizer/Verbalizer Revision with two types of visualizers iconic and spatial	Hypermedia and the Field Dependent and Field Independent learner.
Key Researchers	Witkin and Asch (1948a, 1948b) Herman Witkin is the major researcher in the field.	Pask and Scott (1972) Pask (1976)	Paivio (1971); Riding and Taylor (1976); Richardson (1977); Riding and Calvey (1981)	Riding (1991, 1994, 1996); Riding and Cheema (1991); Riding and Rayner (1995)	Kozhevnikov, Hegarty and Mayer (2002)	Chen and Macredie (2002)
Tests for Style	Group Embedded Figures Test (GEFT) Riding's Cognitive Styles Analysis (CSA) Rod and Frame Test Children's Embedded Figures Test (CEFT) Hidden Figures Test (HFT) Closure Flexibility Test (Concealed Figures Test) Auditory Embedded Figures Test Tactile Embedded Figures Test	Spy Ring Test Clobbits Test Caste and Intuition Study Preference Questionaire (SPQ) Short Inventory of Approaches to Studying	Visualizer/Verbalizer Questionnaire (VVQ) Verbal and Visual Learning Styles Questionnaire Swassing-Barbe Perceptual Modality Instrument Edmund's Learning Style Identification Test (ELSIE) Space Relations Test of Differntial Aptitude of Test Battery Flag—A Test of Space Thinking	Cognitive Styles Analysis (CSA)	Paper Folding Test Foam Board Test Card Rotation Test Cube Comparison Test	Their research is an examination of all research in hypermedia navigation and cognitive styles.
Implications for LIS	Field Dependent Learners need more structure and their instruction should be sequential Field Independent learners prefer to learn independently and prefer to create their own structure for their learning as opposed to having someone else determine the structure and sequence..	Serialists need to understand the details first to create the global picture. Holists learn best by first understanding the global picture and then fitting the details into their global understanding.	Visualisers create understanding through images and illustrations such as charts, graphs or pictures. Verbalizers understand best through words, outlining, and sequential presentation of information.	Wholists assimilate information as a whole. For example, wholists comprehend more when the title of a work is read aloud prior to a read-aloud session. Discrimination skills not as strong. Analytics assimilate by parts of the whole and usually only a few parts at a time. Reading the title aloud prior has no impact. Good at seeing differences and similarities. Verbalizers information is represented verbally. Tend to be more social. Imagers tend to be less social and have an inward focus.	High visual imagers are called Iconic types have less working memory because they visualize individual objects in rich detail. Graphs are viewed as pictures. Iconic learners have less spatial memory available. High spatial imagers are called spatial types visualize the relationship between objects. Graphs are viewed as representation of movement.	FD learners need structure to minimize disorientation. User interfaces should include highlighting of salient information, giving continuous feedback including background information on the links, providing graphics, breadcrumb trails of pages visited. FI learners are not impacted by accommodations for FD learners, although the interface could include a way to turn off the extra cues and clues and to allow them to learn in nonlinearly.

A Proposal for Kansas State Department of Education Research Study

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&
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Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

A Proposal for Kansas State Department of Education Research Study

This brief proposal provides an overview of the 1) background and research focus; 2) methodology; 3) model for linking student learning across the curriculum, and 4) time line for completion of the research. Inspired by the April, 2005 CISSL-IMLS Research Symposium, the study seeks to better understand student learning as indicated in state assessments where instruction is based on Kansas Library-Media and Technology Standards that are aligned with Kansas assessed content standards. Utilizing quantitative and qualitative results, it will describe relationships between student learning and student access to a fully qualified library media specialist, and will serve to describe *school libraries of distinction*. This term, "school libraries of distinction," is for now a concept-holder. We believe that we are likely to discover a more appropriate term, one that will accurately describe excellent 21st century school libraries, and that will resonate with students in today's schools.

Background of the Study

This study titled *School Librarians, Technology and Instruction to Achieve Academic Standards* is sponsored by the Kansas Department of Education. It is coordinated through Kansas School Library Coalition members including individuals from: Emporia State University (ESU); Kansas State Department of Education (KSDE); Kansas Association of School Librarians (KASL); Kansas Association for Educational Communications and Technology (KAECT); and the Kansas State University (KSU). Primary researchers are: Mirah J. Dow, PhD, Assistant Professor, Emporia State University; and, Jacqueline McMahon Lakin, PhD, Information Management Education Program Consultant, Kansas State Department of Education.

This research has its origin in five decades of research on the impact of school librarians/libraries on student learning. Most recently, research conducted by Dr. Keith Curry Lance et al. involving 3,000 schools and over three million students shows the positive impact of credentialed libraries and curriculum-centered library program on improving student test scores. Ohio built upon the Lance studies by examining the multi-dimensional dynamics of student learning through school libraries from the student point of view. Also, Kansas conducted its own studies in student learning and collaboration with school librarians and fellow teachers utilizing *The Handy 5*. *The Handy 5* research provides a model for planning and assessing integrated information skills instruction. Precise data were used to ensure standardization of data collection by a research team consisting of university faculty, state department staff, professional organizations and school librarians.

Today there is an opportunity in Kansas to continue building upon these research-based findings. In Kansas, the department of education has reached a "tipping point" in terms of researching student learning. The 2005–06 school year is a crucial turning point in the State's accreditation system. Changes include implementation of:

- a new five-year assessment window (based on criterion reference testing) in reading, mathematics, writing, social studies (history/government), and science;
- Kansas Individual Data on Students (KIDS) database for managing student records;
- revised library-media standards with the addition of technology standards;
- locally administered 8th grade technology assessment; and,
- revised Kansas Quality Performance Accreditation system to meet No Child Left Behind (NCLB) requirements.

The KIDS database will allow state content assessment scores to be compared to student access to full-time librarian(s), part-time librarian(s), or no available school librarian.

Research Focus

Statewide studies in Alaska, California, Colorado, Iowa, Massachusetts, Minnesota, Oregon, Pennsylvania, Texas, Ohio and Kansas present one clear and consistent finding: A school library media program with a full-time, credentialed library media teacher, support staff, and a strong computer network (one that connects the library's resources to classrooms and labs) leads to higher student achievement, regardless of social and economic factors in a community. On the basis of what is already known about how students benefit from effective school libraries, this study seeks to extend these findings by analyzing quantitative and qualitative data from schools where students are instructed based on aligned state content, library-media and technology standards for student learning. Our goal is to answer these questions:

1. Do student performances on state assessments improve as a result of instruction based upon State Library-Media & Technology Standards that are aligned with state assessed content areas?
2. Is there a positive correlation between student performances on state assessments and students' access to a fully qualified library-media specialist?

We will use this data to provide recommendations for engagement in teacher and teacher-librarian partnerships for creating and delivery of instruction, model for integration of assessed standards, tools for use in teacher-librarian data collection, educational policy development, and continuous dialog about improvement and professional development across Kansas.

Research Methodology

School library media programs from across Kansas will be selected for this study through review of KSDE assessment results. Judgment sampling process and a Kansas expert panel will make the selection of approximately 10 schools in each of three assessment results categories (high, middle, low). Case studies, which utilize a combination of interview, survey, and observation, will be conducted in the selected schools. The research process is outlined and briefly described in three parts.

Part one will be a quantitative analysis of student access to fully qualified librarians, and student learning as indicated in state criterion-based assessments results (mathematics, reading, science, social science, and writing) by:

- student (approximately 471,000);
- grade level (three – eight, and one high school)
- school (1,431) ;
- district (300); and,
- instructional planning reports.

Part two will be conducted using case study methodology. Cases (schools) will be selected from the State assessment results indicating schools that reached standards of excellent in any content area; schools that are on the "watch list" in that they did not make adequate yearly progress during current school year; and, schools that are on improvement for not making adequate yearly progress. Also, the amount of time on-site by the school librarian will be a determining factor in case selection.

Case studies methods will utilize: 1) OELMA (2004) surveys, a model for understanding how students benefit from school libraries through elaborating "conceptions of help" (the nature and extent of "help" provided by the school library in relation to student learning) and providing some measure of the extent of these "helps," as perceived by students and faculty; 2) 21st Century Education Model, a research-based education model that incorporates six key elements of 21st century learning; and, 3) IMPACT!, a software program to document school librarian collaboration with teachers.

Part three will investigate results of 8th grade, locally designed and administered technology assessment (based on the library-media and technology standards) and collected by the school librarian and/or school technologist. This summative data will be reported to KSDE at the end of the eighth grade year. It will be used in this study as a student learning data-set. We will learn from this whether or not students who have participated in instruction based upon State Library-Media Standards meet the 8th Grade Technology Standards.

Visualization of Research Variables

What does a curriculum-centered model for assessing student learning look like? This research begins with a model that is likely to become clarified through the research process. This initial model is a visualization of the merger of content, school library media, and technology assessed standards coming together to form data sources.

Timeline

Years one-five Quantitative Study

Years two-five Case Studies begin; training modules begin

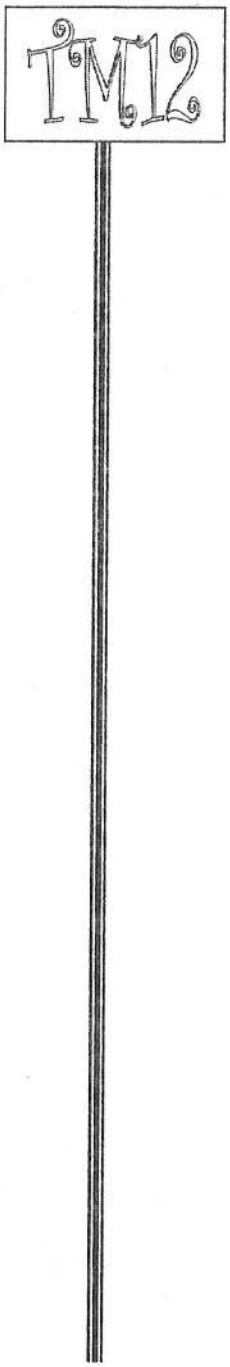
Year-six Trend research reporting

This study is designed to provide tangible and clear evidence of the significant impact of school libraries on student learning. In times of budget, resource and staffing constraints, it is extremely important to communicate empirical evidence about the impact of school librarians/libraries on student learning. With increased focus on standards-based education, many school administrators, school boards and parent for looking for documented evidence of the impact of libraries on student learning as a basis for making decision about library funding, technology, and hiring of professionals and paraprofessionals. From these data, we will identify *school libraries of distinction*; communicate best practices for collaboration and instruction; and, develop training modules for teachers and teacher-librarians. Early in the five year cycle, we will act on immediate Kansas library-related needs.

Treasure Mountain Research Retreat #12 provides a forum for discussion of this proposal. We invite your comments and suggestions about how to best undertake and utilize this opportunity. We welcome your comments and suggestions. Please feel free to contact us at dowmirah@emporia.edu or jlakin@ksde.org

Referenced Studies

http://slim.emporia.edu/kschool/docs/reference.htm
http://www.lrs.org/impact.asp
http://www.oelma.org/
http://www.skyways.org/kasl/handy5rev.html
http://librarypublishing.scholastic.com/content/stores/LibraryStore/pages/images/slw_04.pdf



Appendix A

Keeping Up With the Research Linking School Library Media Center Programs to Achievement

A Handout

David V. Loertscher
School of Library and Information Science
San José State University

Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Keeping Up With the Research Linking School Library Media Center Programs to Achievement

A Handout

American Library Association Conference

June 2005

Compiled by
David V. Loertscher

Content current as of: June 21, 2005

Research Summaries and Bibliographies

- Lance, Keith Curry and David V. Loertscher. *Powering Achievement: School Library Media Programs Make a Difference*. 3rd ed. Hi Willow Research & Publishing, 2005. ISBN: 1-933170-14-X. available from http://www.lmcsource.com Provides summaries and PowerPoint presentations plus discussion starters of all the Lance studies plus other evidence of library media center links to achievement.

- David Loertscher's biography of school library media research. At: http://www.davidvl.org

- Keith Curry Lance's bibliography of school library media research. At: http://www.lrs.org/impact.asp

- Check out the bibliography done as part of the IASL website (International Association of School Librarianship) titled: School Libraries Make a Difference in Student Achievement at: http://www.iasl-slo.org/isld.html

Tools for Linking School Libraries to Achievement

- The most comprehensive list of measures is in: Loertscher, David V. and Ross J. Todd. *We Boost Achievement* Hi Willow Research and Publishing, 2003. ISBN 0-931510-93-7 available at http://www.lmcsource.com

- Ross J. Todd and Carol Kuhlthau are developing various measures for linking libraries to achievement. During 2005, watch their website at: http://cissl.scils.rutgers.edu/

- Miller, Nancy. *Impact!* Hi Willow Research & Publishing, 2004. This Excel spreadsheet allows school librarians to track collaborative efforts on a daily basis and then print out amazing reports for presentations. Available from http://www.lmcsource.com Nancy also expects to have a time tracking spreadsheet analysis tool available late 2005.

- The School Library Association of Great Britain has published two self-evaluation guides for school libraries in that country, one for elementary and the other for secondary. See their website at: http://www.sla.org.uk/ The titles of the two publications are printable as PDFs and are:

    a. *Improve Your Library: A Self-Evaluation Process for Secondary School Libraries and Learning Resource Centers.*
    b. *Improve Your Library: A Self-Evaluation Process for Primary Schools*

Ongoing projects Linking School Libraries to Achievement

National

- Ban Those Bird Units Research Project created by David V. Loertscher at http://www.davidvl.org asks school librarians and teachers to use 15 models of teaching and learning in information-rich and technology-rich information environments and report the improvement in higher-order thinking skills.

- Project Achievement created by David V. Loertscher (http://www.davidvl.org) asks school librarians to create measures and do action research linking their local programs to achievement and report those efforts.

- Check out the CISSL website by Ross Todd and Carol Kuhlthau for developments over time. At: http://cissl.scils.rutgers.edu/

State

1. Virginia Department of Education Office of Educational Technology.
    a. Virginia Linking Libraries and Academic Achievement: Every district has to develop a plan for how they plan to teach and integrate information literacy standards.
    http://www.pen.k12.va.us/VDOE/Technology/OET/library.shtml

2. Washington State
    a. http:///www.k12library.info
    b. Designed to provide school librarians with the skills, tools and training needed to make a positive impact on student achievement
    c. Includes: Study to improve school administrators' perceptions of librarians
    d. Contact Betty Marcoux at elm2@u.washington.edu

3. Ohio
    a. ILILE (Ohio) Project Sails Assessing Information Literacy Skills as they enter College. Also developing an assessment for 9th grade students. Kent State University – at: http://www.ilile.org/

6. Oklahoma Study
    - What do Librarians do all day? Study to track hours/minutes spent in professional and nonprofessional activities for:
        - FT School Librarians with Clerical Assistants
        - FT School Librarians without clerical assistance
        - Non-Professionals in school without full-time librarians

    Project under the direction of Ellen Duecker, Tulsa Public Schools with Nancy Miller and David Loertscher. The results to be reported late 2005

with the development of a tool that individual school librarians can use to compare their use of time with those in the study. Watch http://www.lmcsource.com for the announcement of this tool.

7. Delaware (coming soon from R. Todd) Check the CISL site for more information as this develops.

8. Kansas: Revised Kansas assessments for Spring 2006 provide:
    - Instructional reports for curriculum alignment
    - Student reports
    - Kansas has had these types of reports before, but revised assessments will provide more accurate data with additional grades (3-8). Also, KIDS, a student database, will be up for 2005-2006 school year. Should be able to conduct research down to student level.

Federal Efforts and Reports

- NCES: *The Status of Public and Private School Library Media Centers in the United States: 1999-2000* USDoE NCES 2004-313 E.D. At: http://nces.ed.gov/programs/quarterly/vol_6/1_2/6_1.asp

- School Library Media Centers: Selected Results From the Education Longitudinal Study of 2002 (ELS:2002) at: http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2005302

- *Fifty Years of Supporting Children's Learning: History of Public School Libraries and Federal Legislation From 1953 to 2000* NCES 2005-311 (National Center for Education Statistics) at: http://nces.ed.gov/pubs2005/2005311.pdf

Conferences

Ongoing

- The **Treasure Mountain Research Retreat**, held irregularly but also usually just before the AASL National Conference, is a group of school library scholars and practitioners who get together to share research and practice. Anyone interested in school library research may attend the retreats and information about the upcoming retreat on Oct. 5-6, 2005 in Pittsburgh is available at: http://www.davidvl.org

- At the annual ALA conference, the AASL Research Committee usually sponsors a research program that reports the results of the Highsmith Research Award winner.

- The Judy Pitts Research Forum is held at the biennial AASL national conference and features selected research papers.

- At both the midwinter and annual conferences of the American Library Association, the AASL Research Committee meets usually during the All Committee meeting time. Anyone can attend this committee meeting and it is a great place to keep up-to-date and rub shoulders with some great researchers in the field.

- The International Association of School Librarianship annual conference has research reports from varying countries. The 2005 conference is in Hong Kong. See at: http://www.iasl-slo.org/isld.html

- ISTE (The International Society for Technology in Education) holds an annual conference known as the NECC conference where research on technology in education always has a spot on the program. See at: http://www.iste.org/

Past

- During 2005, two invitational conferences had research threads. The SLJ Summit held in New York City during 2005 had a research thread and its report is available at: http://www.schoollibraryjournal.com/article/CA517173.html Also, CISSL held an international conference in New York City during 2005 and its information is available at: http://cissl.scils.rutgers.edu/

- On June 4, 2002, Laura Bush hosted a White House Conference on School Libraries to discuss the latest research on libraries, student achievement and successful local programs. Mrs. Bush was joined by her co-host, Dr. Robert Martin, Director of the Institute of Museum and Library Services. This website has the full text of papers by Keith Curry Lance ("What the Research Tells Us About

the Importance of School Libraries"), Gary Hartzell, and Kathleen Smith, among others. See at: http://www.imls.gov/pubs/whitehouse0602/whitehouse.htm

Periodicals and Articles

Periodicals

- *School Library Media Research* (SLMR) is the online research journal of AASL and regularly publishes formal studies done about school library media programs. At: http://www.ala.org/aaslslmrTemplate.cfm?Section=slmrb

- School library publications regularly review various research studies in a more popular format: *Teacher Librarian, School Library Journal, Knowledge Quest*

- *School Libraries Worldwide* is the official publication of the International Association of School Librarianship that reports research from around the world. See at: http://www.iasl-slo.org/slw.html

Articles

- "Research in the School Library Media for the New Decade: Polishing the Diamond." *Library Trends*, Spring 2003.

- "Print Environments: Between High and Low Socioeconomic Status (SES) Communities." *Teacher Librarian.* February 2005 (Study examined the access of books among six communities in the greater Los Angeles Area.)

- Also, take a look at Lynn Schrum's editorial in the *Journal of Research and Technology Education* (March, 2005) She expresses her concern about the fact that there is no research linking technology and systemic improvements in student learning. (Could insert "library programs" in the place of "technology" throughout her article and it would still make sense. [from D. Johnson])

- Coiro, J. 2003. "Reading on the Internet: Expanding our Understanding of Reading Comprehension to Encompass New Literacies." *The Reading Teacher*, 56, 458-464. Available online at Reading Online. (http://www.readingonline.org/electronic/elec_index.asp?HREF=rt/2-03_column/index.html)

- Plucker, Jonathan. "Trend Analysis of Indiana K-12 Library Services since the School Library Printed Materials Grant." Center for Evaluation and Education Policy October 8, 2004. At: http://www2.evansville.edu/mgrnweb/2winter05.htm

- Newcomb, Amelia. AASA. "Peter Senge on Organizational Learning:" Of particular note look at "The Learner's Accountability" Q: How does a school

leader combine standards and accountability with the constructivism that you talk about? http://www.aasa.org/publications/sa/2003_05/SengeQ&A.htm

- Possible "Gaps" in the Research. The following research links (and authors) who are not showing "links" with school libraries. . . A wake-up call to us to "get connected" with these organizations and researchers:
  - http://www.nswtl.net/info/research/achieve.htm
  - http://www.tcrconnections.com/research-big6.html
  - http://www.pen.k12.va.us/VDOE/Technology/OET/llaa/overview.html
  - http://www.gatesfoundation.org/Education/ResearchAndEvaluation/Research/StandardsAssessment.htm
  - http://www.ed.gov/offices/OERI/ResCtr.html
  - http://www.ncrel.org/gap/research.htm
  - http://nces.ed.gov/pubs2001/2001030.pdf (Are strong school library media programs noted as indicators of school quality? Why or Why not?)

The Lance Studies

Here is a list of the Lance studies and their predecessor, the Gaver studies. All are linked at: http://lrs.org (Colorado State Library)

Gaver 1963	Gaver, Mary V. *Effectiveness of Centralized Library Service in Elementary Schools*. 2nd ed. New Brunswick, NJ: Rutgers University Press, 1963 (out of print, find in many academic libraries or school district professional libraries).
Colorado I 1993	Lance, Keith C, Linda Welborn, and Christine Hamilton-Pennell. *The Impact of School Library Media Centers on Academic Achievement*. Castle Rock, CO: Hi Willow Research and Publishing, 1993 (available from LMC Source, PO Box 720400, San Jose CA 95172, and online at http://www.lmcsource.com).
Colorado II 2000	Lance, Keith C., Marcia J. Rodney and Christine Hamilton-Pennell. *How School Librarians Help Kids Achieve Standards: The Second Colorado Study*. San Jose, CA: Hi Willow Research and Publishing, 2000 (available from LMC Source, PO Box 720400, San Jose CA 95172, and online at http://www.lmcsource.com).
Alaska 2000	Lance, Keith C., Christine Hamilton-Pennell, Marcia J. Rodney, with Lois Peterson and Clara Sitter. *Information Empowered: The School Librarian as an Agent of Academic Achievement in Alaska Schools*. Revised ed. Juneau, AK: Alaska State Library, 2000 (available for $10 from The Alaska State Library, PO Box 110571, Juneau, AK 98811). Executive summary and order information at: http://www.library.state.ak.us/dev/infoemp.html
Pennsylvania 2000	Lance, Keith C., Marcia J. Rodney and Christine Hamilton-Pennell. *Measuring up to Standards: The Impact of School Library Programs & Information Literacy in Pennsylvania Schools*. Greensburg, PA: Pennsylvania Citizens for Better Libraries, 2000. At: http://www.statelibrary.state.pa.us/libraries/lib/libraries/measuringup.pdf
Massachusetts 2000	Baughman, James C. *School Libraries and MCAS Scores*. Preliminary Edition. Boston, MA: Graduate School of Library and Information Science, 2000. See the study at: http://web.simmons.edu/~baughman/mcas-school-libraries/Baughman%20Paper.pdf

Texas 2001 — Smith, Ester. *Texas School Libraries: Standards, Resources, Services, and Students' Performance*. Austin, TX: EGS Research & Consulting, 2001. Available at: http://www.tsl.state.tx.us/ld/pubs/schlibsurvey/index.html

Oregon 2001 — Lance, Keith Curry, Marcia J. Rodney and Christine Hamilton-Pennell. *Good Schools Have School Librarians: Oregon School Librarians Collaborate to Improve Academic Achievement*. Salem, OR: Oregon Educational Media Association, 2001. Available in print from: LMC Source (http://www.lmcsource.com) and online at: http://www.oema.net/Oregon_Study/OR_Study.htm

Iowa 2002 — Rodney, Marcia J., Keith Curry Lance and Christine Hamilton-Pennell. *Make the Connection: Quality school Library Media Programs Impact Academic achievement in Iowa*. A Research Project by Iowa Area Education Agencies, published by the Mississippi Bend Area Education Agency, 2002. Available at: http://www.aea9.k12.ia.us/download/04/aea_statewide_study.pdf

New Mexico 2002 — Lance, Keith Curry, Marcia J. Rodney, and Christine Hamilton-Pennell. *How School Libraries Improve Outcomes for Children: The New Mexico Study*. Sante Fe: NM: New Mexico State Library, 2002. (Available from LMC Source online at http://www.lmcsource.com).

Michigan 2003 — Rodney, Marcia J., Keith Curry Lance, and Christine Hamilton-Pennell. *The Impact of Michigan School Librarians on Academic Achievement: Kids Who Have Libraries Succeed*. Salt Lake City: Hi Willow Research and Publishing, 1993 (available from LMC Source online at http://www.lmcsource.com).

Illinois 2005 — Lance, Keith Curry, Marcia J. Rodney, and Christine Hamilton-Pennell. *Powerful Libraries Make Powerful Learners: The Illinois Study*. Canton, IL: Illinois School Library Media Association (available via http:/www.islma.org).

Other Research Studies on School Libraries and Achievement

Florida 2003 — Baumbach, Donna J. *Making the Grade: The Status of School Library Media Centers in the Sunshine State and How They Contribute to Student Achievement*. Salt Lake City: Hi Willow Research and Publishing, 2003. (available from LMC Source at PO Box 131266 Spring TX 77393 or online at http://www.lmcsource.com)

Ohio 2003	Todd, Ross J. *Student Learning Through Ohio School Libraries: A Summary of the Ohio Research Study*. OELMA. Study available at http://www.oelma.org/StudentLearning/documents/OELMAResearchStudy8page.pdf and other resources at http://www.oelma.org/studentlearning.htm
Scotland 2001	Williams, Dorothy and Caroline Wavell. *The Impact of the School Library Resource Centre on Learning.* Library and Information Commission Research Report 112: Report on Research Conducted for Resource: The Council for Museums, Archives and Libraries. Aberdeen, Scotland: The Robert Gordon University for The Council for Museums, Archives and Libraries, 2001. Available at: http://www.rgu.ac.uk/files/SLRCreport.pdf
Minnesota 2003	Baxter, Susan J. and Ann Walker Smalley. *Check It Out!: The Results of the School Library Media Program Census*. Saint Paul: Metronet, 2003. Available at http://metronet.lib.mn.us/survey/index.cfm
Missouri 2003	Miller, Jamie, Jinchang Want, Lisa Whitacre, and Quantitative Resources. *Show Me Connection: How School Library Media Center Services Impact Student Achievement*. Available at http://dese.mo.gov/divimprove/curriculum/librarystudy/libraryresearch.pdf
Australia 2003	Lonsdale, Michele. "Impact of School Libraries on Achievement: A Review of the Research: Report for the Australian School Library Association." Australian Council for Educational Research. Melbourne. March 2003. At: http://www.asla.org.au/research/
North Carolina 2004	Burgin, Robert and Pauletta Brown Bracy. *An Essential Connection: How Quality School Library Media Programs Improve Student Achievement in North Carolina.* Salt Lake City, Hi Willow Research & Publishing, 2004. Available at http://www.rburgin.com/NCschools2003/NCSchoolStudy.pdf and an updated version from LMC Source at http://www.lmcsource.com
Indiana Ongoing	Ongoing. Follow online at http://www.ilfonline.org/Units/Associations/aime/Data/index.htm
Delaware 2005	Todd, Ross. Should be released some time in 2005. A Google search plus notifications in library periodicals should provide access when published
Smalley 2004	Smalley, Topsey N. "College Success: High School Librarinns Make a Difference," *Journal of Academic Librarianship*, vol. 30, No. 3, May, 2004, p. 193-98.

Other Research Reviews of Interest

Krashen 2004	Krashen, Stephen. *The Power of Reading*. 2nd Edition. Libraries Unlimited, 2004 (available for sale online at http://www.lu.com).
McQuillan 1998	McQuillan, Jeff. *The Literacy Crisis*. Portsmith NH: Heinemann, 1998 (available for sale online at http://www.heinemann.com).
Carnegie Corp. 2004	*Reading NEXT : A vision for action and research in middle and high school literacy* (A report to Carnegie Corporation of New York) Alliance For Excellent Education. 2004 Carnegie Corporation of New York. At: http://www.all4ed.org/publications/ReadingNext/
Brock Study 2005	*Brock, Cathy Collins.* "Trade Books: How they Significantly Increase Students' Vocabulary, Comprehension, Fluency, and Positive Attitudes Toward Reading." Institute for Literacy Enhance Research Report 1739-004 A Research Investigation. 2005. (Google the first five words of the title for a copy)
Scholastic Reading Bibliography 2005	Scholastic has published a pamphlet "Research on Reading" that lists a number of research articles connected to reading. See them under research on trade books at: http://teacher.scholastic.com/products/paperbacks/articles.htm
Scholastic Library Bibliography 2004	"School Libraries Work!" A Research Foundation publication by Terry Young. Scholastic, 2004. This pamphlet was disseminated by the thousands by Scholastic and is due to be revised by Terry in 2005. It is downloadable at: http://librarypublishing.scholastic.com/content/stores/LibraryStore/pages/images/slw_04.pdf
Loertscher And Woolls 2002	Loertscher, David V. and Blanche Woolls. *Information Literacy A Review of the Research*. 2nd Edition. Hi Willow Research & Publishing, 2002. Available from http://www.lmcsource.com
Chelton and Cool 2004	Chelton, Mary K. and Coleen Cool. Eds. *Youth Information Seeking Behavior: Theories, Models, and Issues.* Scarecrow Press, 2004.
Marzano 2000+	The Robert Marzano What Works Guides are indispensable as a key to research in educational theory and curriculum development. Begin with: *What Works in Schools: Translating Research into Action* ASCD, 2003.
Cawelti Buide 2004	Cawelti, Gordon, ed. *Handbook of Research on Improving Student Achievement*. 3rd ed. Educational Research Service, 2004. A very useful summation and analysis of the research in various parts of the curriculum and education in general.

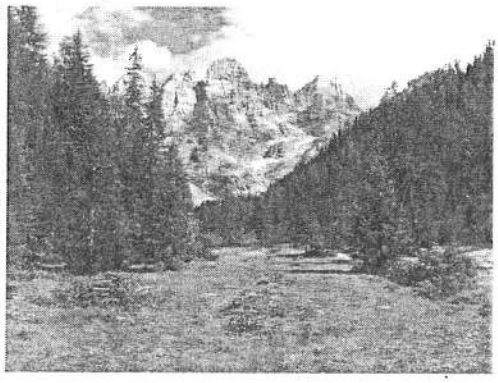
ASCD 2004+	Check out the March 2004 issue of *Educational Leadership* with the issue title: What Research Says About Reading. Numerous articles reviewing the research.
Krashen	Subscribe to Krashen@sdkrashen.com to keep up with Krashen's pithy and pointed critique of reading research and his replies to editors, newspapers and journals throughout the world. There is no truer friend to libraries and their impact on reading.
Technology And Canada	Check out the research reports connecting technology learning at: http://www.hrsdc.gc.ca/asp/gateway.asp?hr=en/hip/lld/olt/Skills_Development/Research_reports.shtml&hs=lxt
CARET	CARET is the research on technology databank sponsored by ISTE (The International Society for Technology in Education. Check out their site at: http://caret.iste.org/index.cfm?fuseaction=resources
What Works Clearinghouse	Check out the What Works Clearinghouse that describes itself as: "The What Works Clearinghouse was established in 2002 by the U.S. Department of Education's Institute of Education Sciences to provide educators, policymakers, researchers, and the public with a central and trusted source of scientific evidence of what works in education." At: http://www.whatworks.ed.gov/whoweare/overview.html

Appendix B

Understanding the No Child Left Behind Act of 2001

Scientifically Based Research

Learning Point Associates
www.learningpt.org



Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

Understanding the No Child Left Behind Act of 2001

NCREL quick key 7

Scientifically Based Research

LEARNING POINT Associates

The No Child Left Behind Act of 2001

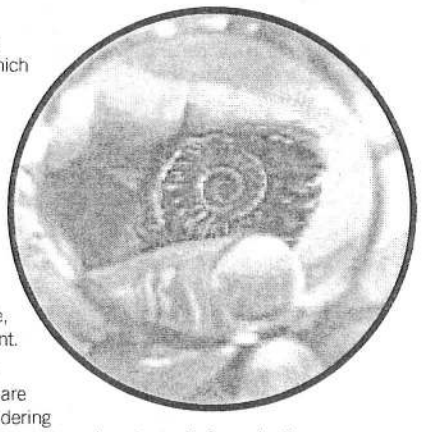
As a reauthorization of the Elementary and Secondary Education Act (ESEA), Congress passed the No Child Left Behind (NCLB) Act of 2001. Signed into law by President Bush in January 2002, the legislation brings many significant changes to schools nationwide.

As a result of the NCLB Act, schools and districts are seeking information to identify, plan, and implement federally funded programs and practices that have been proven to be effective through scientifically based research (SBR). The purpose of this brochure is to help administrators, educators, parents, and community members understand the applicability of SBR and its components as they relate to school improvement efforts under NCLB legislation. It is designed to help you understand how to identify SBR, evaluate evidence of effectiveness, ask key questions about the research you find, and apply SBR to your school improvement efforts.

According to the NCLB Act (2002), a local educational agency or consortium can use federal funds to enact an improvement effort that:

> "Has been found, through scientifically based research to significantly improve the academic achievement of students participating in such program as compared to students in schools who have not participated in such program; or has been found to have strong evidence that such program will significantly improve the academic achievement of participating students" [Section 1606a, 11A-B].

Evidence of Effectiveness—Scientifically Based Research



When school staff members meet to address school improvement efforts, they should first determine their needs and then decide which intervention, program, or model may best address those needs. Under NCLB legislation, funded schools must implement reform strategies informed by "scientifically based research" (SBR), which is defined in Title IX as having six specific components. To make these concepts more readily understood, we are providing more detailed explanations and examples to illustrate the six components. SBR must:

- **Use empirical methods.**

Quality research is conducted in a systematic and consistent manner with great attention to detail. The methods are appropriate, and conclusions are based on systematic observation or experiment.

Practical example: You are the principal of an elementary school serving 500 students. In Grades 1–3, 70 percent of your students are bilingual and not achieving to grade-level standards. You are considering adopting a literacy model that claims to benefit all students, including bilingual students. Before adopting a new program, you should ask some questions about the research: Was this program tested under controlled circumstances in which some schools used the program and some did not? Was the sample size reasonable and relevant to the service provided?

- **Involve rigorous and adequate data analyses.**

Data collected in a high-quality study should be examined with appropriate statistical measurements to test the stated hypothesis and justify the conclusions drawn from the research. Failure to use proper statistical measurements could result in inaccurate or misleading results.

Practical example: You are reviewing a study related to the effectiveness of a K–6 mathematics curriculum that claims significant increases in student achievement over a comparable program. Does the analysis account for students who have not stayed in the program for the length of the study? If yes, does it address how the data change as a result of students dropping out? Was the same measurement (test or assessment tool) used over time, and are comparisons and interpretations really possible given the tools used?

- **Rely on measurements or observational methods that provide reliable and valid data.**

Quality data produce accurate and credible findings. SBR utilizes measurements that provide reliable, valid data across multiple measurements and observations. Reliable instruments allow repeated measurements to produce similar results over time. Valid data will show that the assessment tool measures only what it is designed to measure. There must be a connection between the research question and the observed behavior; the research findings are based on that connection. Repeated measurements should yield identical or similar results from one evaluation to the next.

Practical example: You are an elementary school reading specialist looking to improve reading comprehension. A professional development provider shows evidence that in a particular school that adopted its literacy approach, scores increased on a state assessment of third graders. You may reasonably have some concerns about bias, because the service provider may have selected the success stories. You might also have concerns about validity, because the test measures several aspects of reading performance in addition to comprehension.

- **Use either an experimental or quasi-experimental design.**

Quality studies use experimental research designs in which there is random assignment into at least two equivalent groups. One group participates in the program (receives the treatment), and the other group does not. If random assignment is not an option, quasi-experimental designs allow researchers to match the experimental and control groups as closely as possible.

Practical example: You are a concerned parent and member of the school improvement planning team. An external provider's Web site reports the following: "In 20 schools that have used the MathStar approach, student performance on standardized tests increased by over 15 percent in three years compared to national norms!" Was there a control group? If so, were students assigned randomly? Did similar students in the area also make gains in mathematics performance over the same period?

- **Allow for replicability.**

Quality studies include a clear description of the method, instruments, and data used—a description sufficiently detailed to allow a different researcher to conduct the same study. Findings should be free from jargon to allow an informed lay reader to understand them.

Practical example: A research study in a popular journal looked at the achievement of at-risk students in a computer-mediated environment. Does the study allow the reader to actively "participate" in the research process? Can the research process be recreated in another classroom with the same setting? Does the study provide enough information to carry out the experiment?

- **Undergo expert scrutiny.**

Quality studies have been reviewed and approved by independent expert reviewers. A form of quality control has been executed through expert analysis via rigorous, objective, scientific review of the research.

Practical example: A teacher conducted a detailed case study of her experiences in implementing a new reading curriculum. The editor of a popular magazine that addresses a variety of educational issues decided that the experience was interesting and informative, so it was published. Would you consider this to be a highly scrutinized study?

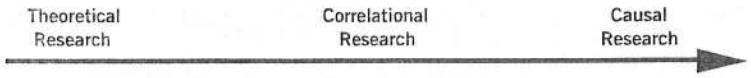
Evidence of Effectiveness—Cumulative Evidence Base

School leaders must make decisions based on the best available evidence, as well as professional judgment, when implementing their programs (U.S. Department of Education, 2002). School reform programs, and the strategies and methods that make up programs, must reflect SBR (as defined above).

It is important to remember that one study, even if it meets all the criteria of SBR, is not enough to be considered sufficient evidence of effectiveness. In most cases, a mix of research exists composed of numerous studies using various methodologies, including but not necessarily limited to experimental or quasi-experimental designs. If an experimental or quasi-experimental design has not been used, however, claims of causality are more tenuous and should be treated with caution. For a thorough but nontechnical guide to assessing the quality of research studies, see *Identifying and Implementing Educational Practices Supported by Rigorous Evidence: A User Friendly Guide* (U.S. Department of Education, 2003).

It might be helpful to note that research exists on a continuum—from research that is purely theoretical in nature, to research that shows a correlation between variables, to research that shows causation. As shown in the diagram, an educational reform program typically starts out as a theoretical relationship between the

variables of interest, is then subjected to correlational studies to understand the relationships of the variables, and finally is subjected to causal studies to examine whether the variables in question are actually causing, for example, changes in student achievement.



Progression from theory to scientifically based practice

While this process does not always happen in the "real world," when you are examining research that purports to make causal claims, look for evidence of this process. Because a program must adapt to meet the specific needs of a particular student population, it is important that clear evidence explains why and how a program works, not just that it does. For answers to the "why" or "how" questions, there must be a theory underlying the program, and evidence that previous research found that the theory successfully predicts certain outcomes.

In order to meet NCLB criteria, school leaders must find ample research evidence for their reform program of choice. Finding SBR and building a cumulative research base are certainly daunting tasks, but resources are available to help. Some are listed in the next section.

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LEARNING POINT ASSOCIATES KEY RESOURCES

Learning Point Associates has resources to assist you in understanding and implementing NCLB in your school and district. Visit our Web site (www.learningpt.org) and *Ahead of the Curve* Web site (www.ncrel.org/policy/curve) containing NCLB information.

NCREL's Learning Point magazine article **"Wake-Up Call"** (www.ncrel.org/info/nlp/lpsp03/wakeup.htm) outlines the challenges of implementing SBR in schools.

NCREL's Learning Point magazine article **"Digging Out"** (www.ncrel.org/info/nlp/lpsp03/dig.htm) focuses on using the best strategies to locate and identify SBR.

Making Good Choices: A Guide for Schools and Districts (www.ncrel.org/csri/tools/makegood/title.htm), a revised publication, provides a process for examining school needs for reform and creating a reform initiative that will address those needs.

Pathways to School Improvement Web site (www.ncrel.org/pathways) is designed primarily to help school improvement teams as they go through the phases within the school improvement process.

ADDITIONAL KEY RESOURCES

Scientifically Based Research and the CSR Program (*Comprehensive School Reform [CSR] Guidance: Appendix C*) (www.ed.gov/programs/compreform/guidance/appendc.pdf) is designed to help school staffs increase their understanding of what SBR is, and use that understanding to assess the quality, relevance, and usefulness of the research they examine.

What Works Clearinghouse (www.w-w-c.org) Web site contains Web-based databases that provide a compendium of high-quality scientific research studies and reviews of scientific evidence of effectiveness of educational programs, practices, products, and policies.

Identifying Research-Based Solutions for School Improvement (www.goodschools.gwu.edu/pubs/sbrsub.php), an online workshop from the National Clearinghouse for Comprehensive School Reform, is designed to provide educators with the skills they need to find, identify, and make good use of the best available educational research.

The Iowa Professional Development Model (www.state.ia.us/educate/ecese/tqt/tc/doc/ipdm02.pdf) provides a framework intended to assist districts, schools, and individuals as they design professional development programs.

Education Commission of the States Web site (www.ecs.org) contains resources and a Web-based summary of state policies and activities related to NCLB requirements and SBR.

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Glossary of Common Research Terms

case study: An extensive study of an individual unit, group, institution, organization, or program. It provides a thorough analysis of the object being studied.

causality: The relationship between the cause and the effect. Causality exists under three conditions: the intervention (e.g., a reform model) must come before the outcome (e.g., increased student achievement); there must be covariance (e.g., if the intervention increases slightly, the outcome will increase slightly); and there must not be extraneous explanations for the observed outcome.

control group: A group of individuals whose characteristics are similar to an experimental group but who do not receive any of the program services or products being evaluated.

correlation: A standardized measure of linear association between two variables. Its values range from -1 (strong negative association) through zero (no association) to +1 (strong positive association).

empirical research: Research conducted for the purpose of collecting measurable data in terms of attitudes, behavior, or performance. Designed to generate projectable, numerical data on a topic.

evidence of effectiveness: A term used in the NCLB legislation, which states that programs must "prove evidence of effectiveness," meaning a program must show—through student achievement data—that it improves achievement.

experimental group: A group in an experimental design that receives the treatment or program.

experimental research: A research design that involves random assignment of study participants to either an experimental or control group. This allows researchers to compare the outcome (e.g., test scores) of the experimental group to that of the control group, and to assess the effect of the treatment. The strongest research design for establishing evidence of effectiveness.

qualitative research: Collection of nonnumerical data using interviews, observations, and open-ended questions to gather meaning from nonquantified narrative information.

quantitative research: Collection of numerical data in order to describe, explain, predict, and/or control phenomena of interest.

quasi-experimental research: A research design that includes some type of intervention or treatment and provides a comparison. Lacks the degree of control over all elements (environment, intervention, subject selection) found in experimental research design, but may provide some evidence of effectiveness. Comparison groups are frequently used, but maximum controls are employed to minimize threats to validity; random selection is typically not possible or practical.

reliability: The degree to which an instrument *consistently* measures in the same way on repeated trials (e.g., a math test given to a student one day would yield roughly the same score if given to the same student the next day).

theory: A comprehensive explanation of a given set of data that has been repeatedly confirmed by observation and experimentation, and has gained general acceptance within the scientific community, but has not yet been decisively proven.

validity of an instrument: The degree to which a measure accurately assesses the specific concept it is designed to measure (e.g., whether a reading-comprehension assessment focuses on students' understanding of a story or their ability to read the story).

validity of a research study: A study has *internal validity* when the possibility is minimal that other (confounding) variables are responsible for the effect in question. *External validity* is the extent to which the results of a study are generalizable and transferable to different populations, settings, and conditions.

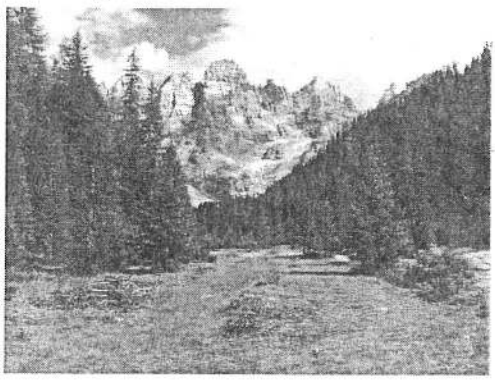
Appendix C

Assessment of 21st Century Skills

The Current Landscape

Executive Summary

Partnership for 21st Century Skills
http://www.21stcenturyskills.org/



Understanding in the Library
Papers of the Treasure Mountain Research Retreat #12
Pittsburgh, PA, October 5–6, 2005

Hi Willow Research and Publishing

EXECUTIVE SUMMARY

How can we best prepare students to succeed in the 21st century? The Partnership for 21st Century Skills, a coalition of leading education, business and technology organizations, organized to address this question and create a powerful vision for 21st century education. The group's members recognize the profound gap between the knowledge and skills most students acquire in school and those required in today's 21st century communities and technology-infused workplaces. In its 2003 report, *Learning for the 21st Century*, the Partnership synthesized the perspectives of business, education, and government leaders to create a common language and strategic direction for efforts to infuse 21st century skills into K-12 education and make U.S. education more globally competitive.[1] In its subsequent reports and tools, the Partnership has continued to provide guidance to the education community, policymakers and other leaders as they work to embed 21st century skills into learning to better meet the demands of the global economy.

In order to bring its vision to fruition and successfully integrate 21st century skills into our educational system, the Partnership recognizes that another critical question must be asked: "How do we measure 21st century learning?" The Partnership believes that the movement to embrace and foster widespread adoption of 21st century skills hinges on identifying ways to assess students' acquisition and application of this knowledge. In light of this, the Partnership has developed its current report, *Assessment of 21st Century Skills: the Current Landscape*. In it, we have not reviewed assessments of traditional core content areas, understanding that many studies and reports have already addressed these types of assessments. Rather, we have surveyed the current landscape of assessments that measure key dimensions of 21st century learning: 21st Century Content (Global Awareness, Financial, Economic and Business Literacy and Civic Literacy), Learning Skills (Information and Communication Skills, Thinking and Problem-Solving Skills, and Interpersonal & Self-Directional Skills), and Information and Communication Technology (ICT) Literacy. These key elements of 21st century learning are critical for every child's success as a worker and citizen in the 21st century. These are explained briefly here:

- The concept of *Global Awareness* acknowledges that students need a deeper

[1] This report, as well as more detailed information on the Partnership framework, is located at www.21stcenturyskills.org

understanding of the thinking, motivations, and actions of different cultures and countries in order to successfully navigate and respond to communities and workplaces extending beyond their neighborhoods.

- The concept of *Civic Engagement* recognizes that students need to understand, analyze, and participate in government and in community, both globally and locally, in order to shape the circumstances that impact their daily lives.

- The concept of *Financial, Economic and Business Literacy* responds to the growing demand on people to understand business processes, entrepreneurial spirit, and the economic forces that drive today's economy.

- The concept of *Learning Skills* acknowledges the need for students to think critically, analyze information, comprehend new ideas, communicate, collaborate, solve problems, and make decisions, while *ICT Literacy* recognizes that technology is essential to realizing these learning skills in today's knowledge economy.

Assessments of student achievement, from widely recognized standardized tests to classroom-based measures, have become an essential component of educational practice and a crucial ingredient of educational reform. While the assessment landscape is replete with assessments that measure knowledge of core content areas such as language arts, mathematics, science and social studies, there is a comparative lack of assessments and analyses focused on elements of 21st century learning. Additionally, there is a growing consensus that current assessments are not adequately measuring a student's ability to engage in the kinds of complex thinking and problem-solving tasks required of a 21st century learner. With spending on assessment development expected to grow into the billions of dollars this decade ($3.9 billion according to recent Government Accounting Office estimates (GAO, 2003)), it is vital that our investment focuses not merely on fulfilling federal requirements, but on preparing today's children to face the challenges of tomorrow's complex communities and workplaces. New assessment tools must be developed.

The Partnership is encouraged that the movement to foster 21st century learning as well as to develop the means to measure complex, higher-order thinking skills is emerging. States are meeting to discuss global awareness education and some have civic-skills assessments

tied to accountability measures. Economics education has received federal recognition with the passage of the Excellence in Economics Education Act. With regard to learning skills and ICT literacy, both private and public sector organizations are demonstrating new approaches to assessing 21st century skills. And internationally, a broad consensus exists among education ministries that ICT literacy must be treated as a core skill area in the new century. While these examples are encouraging, they do not yet indicate a broad focus on assessing 21st century skills. Most K-12 assessments in widespread use today—whether they be of 21st century skills and content or of traditional core subject areas—have thus far measured only a student's knowledge of discrete facts, not a student's ability to apply knowledge in complex situations.

As more of our economic competitors move to foster 21st century skills within their educational systems, the United States faces a critical challenge to keep pace in preparing our students to meet the demands of today's global community. While U.S. students have improved their performance on international assessments of discrete knowledge—falling near the middle of the pack on the Trends in International Mathematics and Science Study (TIMSS)—their performance on the Programme for International Student Assessment (PISA), which measures how 15-year-olds apply reading, mathematics and science content knowledge and skills to analyzing and evaluating information and solving problems and issues in real-life contexts, places the U.S. in the bottom third. Without a shift in focus in the U.S., it seems likely that this 21st century learning gap will only widen as other nations continue to stress 21st century skills in their national education plans.

Clearly, there is much to be done to ensure that U.S. students emerge from our schools with the skills needed to be effective workers, citizens and leaders in the 21st century. The Partnership envisions this report as a significant first step toward creating a comprehensive agenda focused on assessing 21st century skills and 21st century content.

Key Findings

ASSESSMENT OF GLOBAL AWARENESS

Global awareness, while not wholly absent from American public education, has historically not been viewed as necessary to the lives of average American citizens. In recent

years, however, interest has grown in promoting "international education" or "international studies." Though K-12 international education is now teeming with activity, the creation of global awareness assessments remains a largely unexplored area. Existing assessments are tied closely to geography education; no measures currently exist that address students' understanding of global and international issues. What activity has occurred has taken place largely at the state level with many states convening meetings to explore global awareness education. Notable examples include Connecticut, Delaware, Kansas and Massachusetts. The current assessment landscape is limited primarily to geography education, specifically the *National Assessment of Educational Progress (NAEP), Geography Assessment* and *Intermediate-Level Geography Test.*

ASSESSMENT OF CIVIC ENGAGEMENT

Civic Engagement is one of the oldest and most well established fields among those that the Partnership has chosen to examine. A number of major organizations have long track records of involvement in creating resources and educating the public about civics and civics-education issues. Nineteen states have some civic-skills testing, and eleven of those states tie the tests to accountability measures. Our survey identified a number of innovative studies and projects aimed at creating new and better assessments of young people's civic knowledge, attitudes, and behavior. In the last four years, the Center for Information and Research on Civic Learning and Engagement (CIRCLE), based at the University of Maryland's School of Public Policy has partnered with an array of other organizations to develop indicators and assessments of students' civics knowledge and civic-oriented practices, including the *Civic Engagement Quiz* and the *Databank of Civic Assessment Tools.*

ASSESSMENT OF FINANCIAL, ECONOMIC AND BUSINESS LITERACY

The importance of economics education, in particular, has been recognized on the federal level with the passage of the Excellence in Economics Education Act, a component of NCLB. A 12th grade NAEP (*National Assessment of Educational Progress*) examination is currently under development. A number of organizations have advocated the importance of both economic and financial literacy as a key component of K-12 education and are working on raising awareness, developing programs, creating curricula, providing training, and

developing assessments that can be used to gauge student knowledge in these domains. With respect to entrepreneurial skills, a number of assessments have been developed; however, there are no large-scale, cross-program assessments in the area of entrepreneurship. With respect to economic and financial literacy at the pre-college level, a number of assessments have been developed, including the *Junior Achievement Economics Test Bank* and *Jump$tart Assessment of Financial Literacy*.

ASSESSMENT OF LEARNING SKILLS

In psychological and educational literature, learning skills—information and communication skills, thinking and problem solving skills, and interpersonal and self-directional skills—have a long research and development history. We limited our examination of existing learning skills assessments to instruments that have been published and have undergone the appropriate testing or those that are under development that show promising tendencies for new and creative assessment techniques. While a significant number of assessments are quite old, dating back more than 40 years, a new and growing crop of assessments that place greater scrutiny on the kind and quality of skills being measured are beginning to appear, sometimes embedded within larger content-area assessments, as in the PISA (*Programme for International Student Assessment)*, an internationally-administered assessment developed by Organisation for Economic Co-operation and Development (OECD). A number of other learning skills assessments are currently in development, including *The Rainbow Project's* large-scale thinking-skills assessment, sponsored by the College Board and led by Robert Sternberg of Yale University; the Metiri Group's *Self-Directed Learning Inventory*; and the Council on Aid to Education's *Assessment of Analytic Reasoning and Communication Skills*. While some of these new assessments are targeted at the college level, they may have future application in the high school arena.

ASSESSMENT OF ICT LITERACY

A broad consensus exists among education ministries and major education-oriented

NGOs throughout Europe, Asia, Australia, and the Pacific Rim that ICT literacy must be treated as a core skill area in the new century. In logical conjunction with this increased emphasis on ICT literacy, interest has grown in developing assessments that (a) reveal the cognitive skills that students employ in conjunction with their use of technology and (b) use technology as their means of delivery. The process of creating such assessments is only beginning even among the leading-edge education ministries, with the exception of the United Kingdom.

The U.K.'s emerging tools, particularly the new *Key Stage 3* (age 12-13) *ICT Literacy Assessment* created by the British government's Qualifications and Curriculum Authority (QCA), are attracting the attention of other ministries of education in Europe and Asia. One of the most promising new assessments we found in any of our five content areas, the Key Stage 3 instrument assesses both content-area and thinking skills as well as provides both national data on students' capabilities and information on individual students pertinent to classroom-level instruction. The QCA plans to rollout the assessment nationwide by mid-2006. In the United States, only the Educational Testing Service's new ICT Literacy Assessment for higher-education settings approaches the work being developed in Great Britain. It is currently targeted at college age students, though it may well have implications for future assessment at the K-12 level, particularly in high schools. The International Society for Technology in Education (ISTE) and Microsoft are developing a performance-based assessment aimed directly at eighth grade, the *NETS Online Technology Assessment.*

RECOMMENDATIONS:

In keeping with its role as the advocate for 21st century learning, the Partnership has identified the following key principles and strategic recommendations to guide efforts at building assessments of 21st century skills.

Key Principles For Assessing 21st Century Learning

- We need assessment tools that will:
  - measure student mastery of 21st century skills.
  - diagnose where students require intervention in terms of 21st century skills.
  - measure the educational system's effectiveness in teaching 21st century skills.
  - permit students to demonstrate their proficiency in 21st century skills to educational institutions and prospective employers; high stakes assessments alone do not generate evidence of the skill sets that the business and education communities believe will ensure success in the 21st century.
- No single assessment tool will accomplish all these objectives. A diverse menu of assessment tools must be available.
- Technology should be integrated into assessment tools to effectively measure 21st century skills.

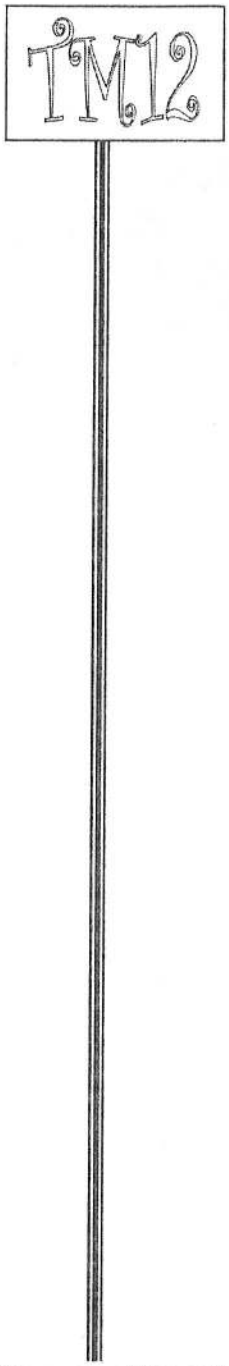
Assessing 21st Century Skills: Five Strategic Recommendations

- Articulate and build national consensus around the assessment of 21st century skills through large-scale public education initiatives.
- Implement a policy that supports a broad vision for the adoption of assessments of 21st century skills.

- Support an R&D infrastructure for building assessments that measure cognitively complex and real-world-related tasks, led by the federal government and education research institutions in higher education and the public sector.

- Develop support in the private and public sectors to create viable production and distribution networks for assessment instruments and tools that measure 21st century skills.

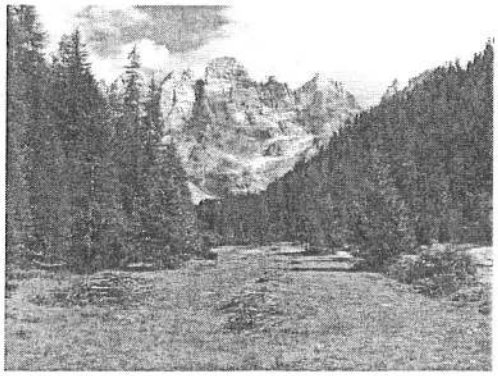
- Challenge every state to adopt a system that assesses the full range of 21st century skills and 21st century content knowledge by 2010.



Appendix D

Caret Technology Research Excerpts

http://caret.iste.org



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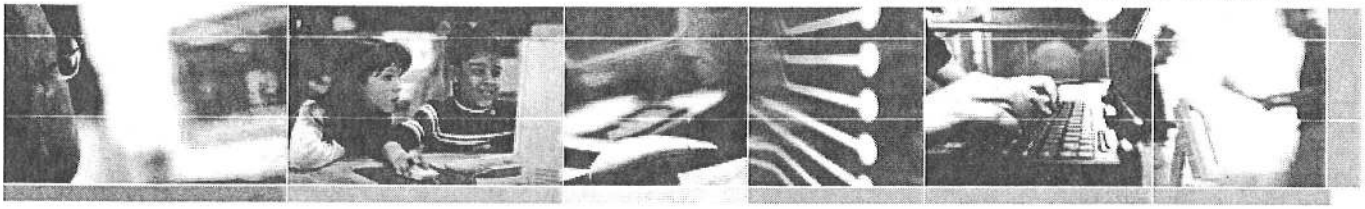
Research guideposts to better technology decisions



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Welcome to CARET

CARET bridges education technology research to practice by offering research-based answers to critical questions.

- Browse Questions & Answers to learn what studies show about topics such as student learning, curriculum and instruction, and professional development.
- Click on Search to find and read CARET reviews of articles and their implications.
- Create your Profile to receive notice of new reviews and topics.

CARET NEWS

CARET Presents at NECC (6/14/05)
CARET staff will present on **"Shovels and Tweezers: Approaches to Using Research for Decisions"** at the National Educational Computing Conference in Philadelphia, **June 30, 2005, 1:30-2:30 in room 108A** of the Philadelphia Convention Center. The presentation will focus on using different research databases, such as CARET and WWC, to meet different needs.

CARET invites you to contact us with your questions and feedback.

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Research guideposts to better technology decisions

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TOPIC: Student Learning

Q: How can technology develop higher order thinking and problem solving?

Click on an answer below to find research evidence, references, and CARET selected studies:

a. Technology can enable the development of higher order thinking skills when students are taught to apply the process of problem solving and are then allowed opportunities to apply technology in development of solutions.

b. Technology can enable the development of higher order thinking skills when students work in collaborative groups while using computers to solve problems.

c. Technology can enable the development of critical thinking skills when students use technology presentation and communication tools to present, publish, and share results of projects.

Submit another topic or question

CARET is a project of the International Society for Technology in Education in partnership with Educational Support Systems. CARET was founded in 2000 with a grant from the Bill & Melinda Gates Foundation.

TOPIC: Student Learning

Q: How can technology develop higher order thinking and problem solving?

A: Technology can enable the development of higher order thinking skills when students are taught to apply the process of problem solving and are then allowed opportunities to apply technology in development of solutions.

RESEARCH EVIDENCE

Computers, combined with drama and Socratic dialogue, build thinking skills. The Higher Order Thinking Skills (HOTS) pull-out program, developed in the early 1980s to build the thinking skills of students through exposure to a combination of computers, drama, and Socratic dialogue, enabled disadvantaged fourth through seventh graders to achieve:

- twice the national average gains on reading and math test scores,
- honor roll status for 10 to 15 percent of the students in 1994, suggesting a transfer of the students' cognitive development to learning specific content, and
- increased performance on measures of reading comprehension, metacognition, writing, components of IQ, transfer to novel tasks, and grade point average (Coley et al., 1997; Pogrow, 1996).

Higher-order thinking skills improve with home and school access to computers. Students who were supplied home computers and modem access to the school were compared with students who didn't have this equipment. The students with home computers and modem access to school realized:

- an increase in all writing skills,
- better understanding and broader view of math,
- greater problem-solving and critical thinking skills,
- ability to teach others,
- greater self-confidence and self-esteem, and
- more confidence with computer skills. (Coley et al., 1997; Rockman & Sloan, 1995).

Software tools that promote student collaboration also promote "higher level" science discussions. Fourth and fifth grade students were divided into teams of four or five for a 10-week project designing a lesson for teaching third graders about the brain. Science discussions that led fourth and fifth grade students to reformulate the academic content at higher levels also enabled them to:

- focus on the design of software screens,
- choose their research question within the confines of the science subject,
- choose the software screens to design, and
- choose the methods for conducting their research for teaching third graders

about the brain.

Students who were experienced with collaborative software design tools provided better learning opportunities for their peers who were newcomers to the software. "Their extensive questioning functioned as a way for their teams to bootstrap up to the next level of engagement." The combination of whole-classroom science activities with more individualized research questions allowed both for content coverage as well as for activities that were intellectually and socially meaningful to individuals (Kafai & Ching, 2001).

On-line use can increase thinking skills. In a study of twenty-two fourth and sixth grade classes in seven urban school districts, half of the students participated in a civil rights curriculum using online communication and the Internet and half did not use the online resources with the curriculum. The study demonstrated that online use can increase thinking skills. Fourth grade students scored higher on measures of presentation of a full picture or overview of an issue and of 'bringing together' different points of view. In contrast, sixth grade students scored higher on measures of effective presentation, accuracy of information, presentation of full picture, completeness of the assignment, and they scored higher overall (Center for Applied Special Technology, 1996).

The CAST study also found that when students used the Internet to research topics, share information and complete a final project within the context of a semi-structured lesson they became independent, critical thinkers (Coley et. al, 1997).

An evaluation of technology programs in California authorized between 1989 and 1992 reported teacher ratings of changes in student achievement as a result of technology use with classroom instruction. Using a scale of 1 to 5, where 0-1 was 'not at all, '2-3 was 'moderate,' and 4-5 was 'significant, positive change in student problem-solving and higher order thinking skills was rated 3.6 (Cradler, 1991).

A RAND project based on a review of the effectiveness literature and focus groups with practitioners in educational technology reported that through the use of technology, students gain a greater sense of responsibility for their work. They produce higher-quality assignments that reflect the increased depth and breadth of their knowledge and talent. (Glennan & Melmed, 1996).

Interactive video programs have been demonstrated to increase problem-solving skills. Students across nine states who used Jasper video software as a centerpiece for mathematics instruction for 3 to 4 weeks were compared with students who did not. The comparative research demonstrated that the students in classrooms that used the Jasper video programs were better at complex problem solving (Cognition and Technology Group, 1992).

Eighth grade students whose teachers effectively used technology for 'simulations and applications' to enhance higher-order thinking skills performed better on the National Assessment of Education Progress test than did students whose teachers did not use the technology. Students whose teachers used the technology primarily for 'drill and practice' (generally associated with lower order thinking skills) performed worse on the NAEP (Wenglinsky, 1998).

Powerful technologies are now available to significantly augment the skills that are necessary to convert data into information and transform information into knowledge. In an historical review of computers in education, research shows that educational technology, when properly applied, can provide an effective means for learning. (Molnar, 1997).

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TOPIC: Student Learning

Q: How can technology develop higher order thinking and problem solving?

A: Technology can enable the development of higher order thinking skills when students work in collaborative groups while using computers to solve problems.

RESEARCH EVIDENCE

Working in pairs can increase test scores. In one study, Integrated Learning Systems (ILS) were combined with cooperative learning. Students who completed the ILS activities in cooperative pairs performed better on mathematics achievement tests than students who worked on the activities individually. The mean posttest score for the cooperative group was more than four points higher than the mean score for the individual group. In addition, students enjoyed helping one another and they remained focused and on task longer when working in pairs. (Brush, 1997).

Teachers spend more time and provide a higher quality of assistance to students in small groups than they do with the whole class. The pairing of students allowed the teacher to spend more time with the students who needed help and to provide a greater amount of small-group tutoring on difficult concepts (Hertz-Lazarowitz & Schacher, 1990).

Discussions of disagreement within a cooperative group can lead to increased performance. Computer learning environments (Logo) were combined with cooperative learning situations in which students are encouraged to disagree and challenge the thinking of their partners. This situation resulted in even greater gains (i.e., students scored higher on subsequent measures of achievement and perspective taking) than situations in which students are encouraged to seek concurrence and avoid disagreement. However, even students who discussed their ideas without apparent conflict, made greater cognitive gains than those who worked alone, leaving open the possibility that cognitive growth is facilitated even when inter-individual conflict is not apparent (Clements & Nastasi, 1999).

StarLogo is an effective tool for promoting understanding of complex systems among pre-college students. When used with pairs of students over 8 to 10 sessions, each session lasting 60 to 90 minutes, students were able to make a strong personal connection with the underlying models of the StarLogo programming software because the programs describe how individual creatures (rather than whole populations) behave. In the initial sessions students were closely guided by the instructor/researcher, and then were encouraged to develop their own project ideas and to construct their own models, based on their personal interests. (Resnick, 1999). According to (Ackermann, 1996), the individual creatures are relatively intuitive and enable learners 'to dive into' the model.

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[go to CARET review]

Submit another topic or question

TOPIC: Student Learning

Q: How can technology develop higher order thinking and problem solving?

A: Technology can enable the development of critical thinking skills when students use technology presentation and communication tools to present, publish, and share results of projects.

RESEARCH EVIDENCE

Hypermedia presentations promote retention and higher order thinking over time. In a study of ninth graders who developed hypermedia presentations on topics such as World War I, Lifestyles between 1870 and 1920, and Immigration and Imperialism, students' on-task behavior increased over time. As students perceived the benefits of planning with the hypermedia, students also developed generalizable skills such as taking notes, finding information, coordinating their work with other team members, writing interpretations, and designing presentations (Lehrer et al., 1994).

The process of integrating relevant words and images is a key step in meaningful learning and is facilitated by presenting an explanation using words and pictures in close proximity to one another. According to (Mayer, 2001, p.189), "When both words and pictures are presented, learners can engage in selecting images, organizing images, and integrating words and images."

Online tools and resources allow students to gather and evaluate information efficiently, then communicate their thoughts and findings. Technology creates opportunities for students to do meaningful work that has value outside school, receive feedback on their work, and experience the rewards of publication or exhibition. Technology provides a widespread audience for students' work. Computers link students to the world, provide new reasons to write, and offer new sources of feedback on ideas (Peck & Dorricott, 1994).

In a study of twenty-two fourth and sixth grade classes in seven urban school districts, half of the students participated in a civil rights curriculum using online communication and the Internet and half did not use the online resources with the curriculum. Fourth grade students scored higher on measures of presentation of a full picture or overview of an issue and of 'bringing together' different points of view. Sixth grade students scored higher on measures of effective presentation, accuracy of information, presentation of full picture, completeness of the assignment, and they scored higher overall (Center for Applied Special Technology, 1996).

The CAST study also found that when students used the Internet to research topics, share information and complete a final project within the context of a semi-structured lesson they became independent, critical thinkers (Coley et. al, 1997).

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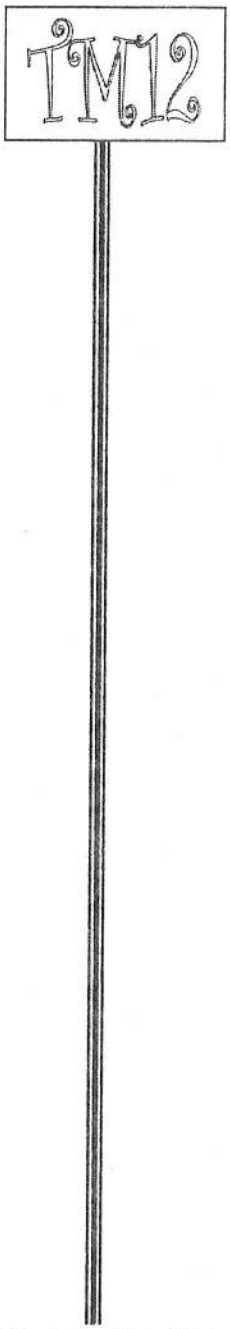
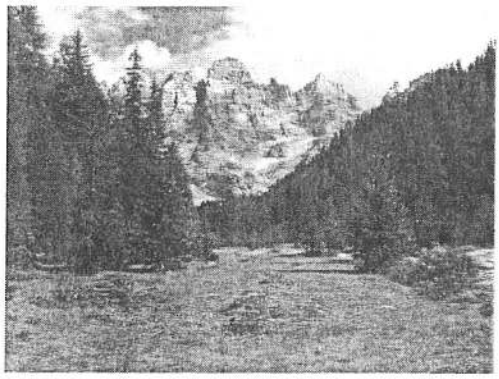
Submit another topic or question

CARET is a project of the International Society for Technology in Education in partnership with Educational Support Systems. CARET was founded in 2000 with a grant from the Bill & Melinda Gates Foundation.



Appendix E

Late Additions



Using Digital Primary Sources with Secondary School Students: Framing the Question for Research Projects

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How many of us in the real world of work and careers have the luxury of spending the day "finding interesting facts"? Most days are filled with problems and puzzles to solve. In reality, life is an ongoing effort to find solutions and locate answers, thus school library professionals should recognize a need for teaching students to use library resources for specific problems and focused research questions. Forming questions is an important part of learning. As students generate valid questions, concept attainment related to standard curriculums could be greatly enhanced [1]. Constructivist classrooms and laboratories are common in K12 schools. Resource and project-based learning are highly valued [2]. Higher order thinking include processes for content analysis, synthesis of new ideas, and evaluation of documents, all of which are the valued outcomes for inquiry-based projects[3]. Too often however, research questions consist of trivial pursuits or investigations into facts and one-liners lacking any transfer to authentic life situations.

> *We are fighting a long school history of topical research. For decades students have been sent to the library to "find out about" some topic. This tradition has led to information gathering but little analysis or thought. Essential questions set students and staff free from this tedious and wasteful ritual. Research becomes motivating and meaningful.* [4].

Answers to essential questions are not found, but rather are generated [5] by students through investigation, inductive thinking, and evaluative processes [6]. Because students analyze information, evaluate contents, and draw their own conclusions, the learning process is more likely to be applied to their own lives. Solutions and conclusions related to their questions may lead to a deep personal interest and continued topic investigation[7]. Gellis further supports this viewpoint, "One of the most important factors in creating a successful writing process is to clearly define a question that will guide the student's inquiry. The purpose of the research paper is, after all, to answer a question or solve a problem for an audience."[8]

Primary source documents are excellent resources for guiding students in constructivist thinking. Some of the benefits for using primary sources documents include historical thinking [processes], point of view, and identifying bias [9]. In addition, students can be taught to become active investigators who will gather evidence that can be used to write their own history book[10]. These types of activities naturally lead to analytical and evaluative thinking. Students are motivated to read first person accounts, especially when the author is a young person who may have lived in a different time period[11]. For example, the strong and sustained interest in the journals of Anne Frank is an indication that young people relate to the personal writings of peers who have lived in different times and cultures. Through many years of personal observation of students at the elementary and secondary levels, as well as preservice teachers, this author suggests that use of primary source documents in digital format could be an effective tool for guiding students to frame research questions that will lead to effective instruction in information literacy skills. In North Carolina, the standard curriculum for information literacy includes skills that will be strongly supported using primary source research. For example:

3.01 Describe personal cultural heritage and environment.
3.02 Collect and compare information about diverse cultures, environments, and peoples.
3.03 Identify bias and stereotypes.[12]

This paper proposes that high school students may use use primary source documents as an effective research method to describe personal and cultural heritage, compare diverse cultures, and identify bias.

Description of the Project

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Following the review of the literature, a partnership was formed with a nearby high school in a rural area of the state. The library media coordinator, a classroom English teacher, and the researcher met to plan a research project using primary source documents. Students were instructed to select a topic of interest before receiving instruction in the use of primary source documents. They were to use the results of their research to create electronic slide presentations using Microsoft PowerPoint. The students were instructed to use three websites to search and locate the primary sources for their presentation projects. The three sites included:

1. The American Memory Project, [13]
2. Documenting the American South,[14] and
3. North Carolina Digital History and Fiction.

The North Carolina[15] site is still being developed with ongoing addition of artifacts during the timeframe of the project. Because the state social studies curriculum includes intensive study of North Carolina history and culture, it is a useful site for North Carolina educators.

Two goals were established for this project: 1. to evaluate students' use of digital primary source documents for meeting state information literacy standards, 2. evaluate methods for guiding students in the use of framed questions for a research presentation. Two areas of emphases were included in the instruction to the students. First, students were taught the importance of framing their research by using a focused research question(s). Second, students were given an introductory lesson in how to use primary source documents to draw conclusions or propose solutions to their focused research question[16]. The lesson had five elements: theme, frame, focus, evidence, and conclusions. An outline of the lesson as designed and developed by the researcher is in Table 1.

Table 1. Contents of lesson presentation on use of Primary Source Documents for a research project

Step 1. Find Your Theme: Find your theme. Locate specific information. This requires front end work, but reduced in-class time searching and browsing
-look for variety of perspectives. Because of enormous amount of information, develop information literacy skills

Step 2. Frame Your Question(s). Framed questions give boundaries to your research. Book chapters are like frames within the textbook. Information in the book must relate to the chapters. Research questions should relate to your theme.

Step 3. Keep a Clear Focus. Fuzzy question: What was life like in the South at the end of the Civil War? Focused questions within the frame of the Civil War: Was life different for a Negro slave girl and the daughter of a small land owner during the time of the Civil War? What was different about their clothes? their education? their home life? their

parents?

Step 4: Gather Evidence. Read, read, read. You are reading other people's mail, diaries, and personal documents. Try to figure out what they are saying. It's not an encyclopedia. Evaluate for accuracy or reliability.

Step 5: Draw Conclusions. Review your research questions. What is the focus? What boundaries make up the frame? Summarize or outline the information you've read. Use the outline to answer your own questions. The conclusion should always answer the framing question(s).

Students were instructed to research a topic and locate information that would provide answers or a conclusion to the focus questions. Results from their research of primary sources were presented electronically by developing PowerPoint slides. At the conclusion of his or her presentations, each student completed a reflective response sheet. Students responded to questions related to their interest in digital primary sources, the most helpful websites, usability of the websites, what significant things were learned, satisfaction levels for the use of the technology, and what parts of the project caused frustration and anxiety. Students were also questioned on their understanding of primary sources and the benefits for using this kind of resource for research. Comments from the reflective surveys were summarized and analyzed for patterns that might indicate a major theme underlying attitudes and understanding of primary source documents. . As can be seen in Table 2. comments fall into two categories. About half the students found the sources helpful and enjoyed the project. In contrast, nearly half reported frustration and lack of satisfaction.

Table 2. Digital Primary Sources: What was helpful and what was frustrating.

What was helpful	What was frustrating
• The document helped me write my focus question [note: student research strategy is in reverse order] • I read, in depth, some documents and made inferences. • More interesting and more useful [than secondary] • "Enjoyed going into the school library to work" comments = 4 total • My focus question helped me stay on topic and not include information that did not support or relate to my topic. • ...much more accurate because it was written by the people of that time period. • Focus question narrowed my search and it was less time consuming for the research. • I learned that people living in different places had different and like experiences, but also people felt different about things like the war... • ...learned to dig deep into a database • ...learned that some views in modern times and history disagree with the views of people during that time... • You get first person views of your research ...you learned about how people reacted to a historic event....	• "can't find anything" comments= 8 total • navigation problems; dead links= 7 total • Hard work, had to dig into the information to find answers • Sometimes the websites were confusing and hard to use ...confusing and outdated.... • Primary research is much harder than using [just] any source available. • ...time consuming, missed being in the classroom... time consuming • ...just did searching and wrote my focus question at the end....[reverse order] • ...learned it is difficult to do a presentation from newspapers and diaries...

Students were clear and consistent in their description and definition of the primary sources. Most students responded that primary source documents were those written or produced by a first person witness, someone who had actually "been there to see" the time in history. Many also (inaccurately) suggested that the information in primary source documents was entirely true. The majority of the students made no mention that first hand eyewitness accounts could also be inaccurate and biased.

> *"Primary sources...were written by different people who lived in that specific time periods, therefore the information must be true and accurate."* Chad

Many of the students were confused about the best use of primary source documents. There were many complaints that the documents "didn't have the information needed" and they "couldn't find answers to my questions". Clearly many of the students were using the primary documents with a textbook or encyclopedia mentality. Many of students also commented that the documents were useful for research in gaining point of view, or various perspectives, however, only a few of the students reported outcomes from their research by using the primary sources as evidence rather than factual information files. Provided below is a summary of several examples of "point of view" reporting.

Ben located original letters and diaries that reported a very different perspective on *Carpetbaggers* from the post-Civil War South. When asked to reflect on, "What was the most significant piece of information you learned in doing this project?" Ben responded:

> *I learned that some views in modern times and history disagree with the views of people during that time. The men called Carpet Baggers were brave soldiers or gallant officers of the Union army who went South immediately after the end of the war. They took with them abundant capital and engaged in legitimate business enterprises." Most people have been made to believe that the ill-will of the South was caused by the Carpet Baggers, whose misgovernment exasperated the white men of that section. Nothing could be farther from the truth."* Ben

Chad's reflections showed that he needed additional instruction on evaluating primary sources for accuracy of content and for understanding how these are used to reveal bias and personal opinion.

> *I learned that primary research is much harder than using any source available. I also learned that primary sources are much more accurate because it as written by the people of that time period. . .* Chad

Amanda became frustrated in the early stages of her project.
Searching for basic facts from diaries, letters, and other personal accounts resulted in her comment,

> *"Patience is a virtue!."*

Like Chad, Amanda did not understand the concept of bias, personal accounts, and disconnected information that are characteristic of primary sources.
She said,

"the documents are always true because they are personal accounts of historic happenings."

One student reflection clearly demonstrates an understanding in the value and appropriate use of primary sources. Leslie's project, on the other hand, showed great potential for research with point-of-view. She clearly demonstrates understanding of primary sources as biased and that the researcher must "write history" based on comparison of a variety of documents. In response to reflective question, "*What was the most significant piece of information you learned in doing this project,*" she responded:

"Opinions vary greatly depending on what you are reading and who you are reading. Also, since you are reading ***opinions*** *don't take everything as fact."* Leslie

With guidance from the librarian or the teacher, Leslie could see the value in digging deeper for answers from personal opinions. Because this was a slide presentation, and not a complete paper with extended statements and conclusions, the project lacked clearly defined conclusion.

"I used the opinions of others to explain the pros and cons to women's suffrage. My main questions were the men and women's reasons in editorials and fliers showing their positions portrayed their messages more accurately...
I found all my answers [to the focus questions] ...people in the 1800's and early 1900's were diligent writers and documented everything. I read fliers and newspaper articles from both sides." Leslie

Analysis of projects revealed a pattern that students earnestly look for facts or general information related to a topic rather than investigation of data to identify point of view for drawing conclusions- Frustration was high:

"I didn't enjoy picking a topic, looking up information, and not finding enough on it...I became frustrated over many things such as lack of information on my topic...I never reached a point of nonfrustration... I believe the question I had was good but not good enough. Most of the questions I had, didn't have a lot of information on it..."

When students were asked, "What did you learn about primary sources for doing research?"*...that primary sources we had were not very good at finding information"*, strongly indicates a need to provide more effective methods for instruction in the purpose and best use of primary source documents.

Summary and Conclusions:

Primary sources are useful when teaching students to make comparison for point-of-view and defending a point of view. Students should understand that the information in a document is personal opinion, first person account that may or may not be entirely accurate. Analysis of the data show that students appear to have gained understanding in the writing of carefully framed

research questions, but lack understanding in the best use of the resources. Students should be taught to recognize the value in use of first person accounts to identify bias, strong emotion, and personal perspective that can be only be reported by an eye witness.
When using primary sources for writing projects, students should generate a focused research question. The question should be *framed* within a specific time, location, and cultural environment. This will help the student to locate information that is useful and applies specifically to his or her question(s). It helps deter random browsing, i.e. aimless wandering on the web. Conclusion statements should always refer to the original research questions. Students should avoid general fact-gathering projects in which topics of personal interest are the focus of random facts that will not contribute to conclusions. Primary sources can be highly motivational for students. Students in the Jamesville High School project adopted strong personal conclusions on several of the topics. Comments and content of the slides suggest that students internalize the conclusions and apply these to their own attitudes and worldview. Students were motivated to continue with searches that would support a particular point of view. Topics of personal interest were particularly successful as motivated students spent additional time to dig deeper into online resources.

Students can become frustrated when using the Internet to locate digital primary sources. Many of the students in this project complained that their search often ended with dead links. This was typical of an earlier project conducted at the same school but with different students. The library media specialist should work closely with students and classroom teachers to ensure that *pathfinders* are provided with a healthy list of available resources. In addition, students should be free to engage in additional browsing to access reliable sources provided in the pathfinder or bookmarked to workstations in the library.

The combination of carefully framed questions to investigate the contents of first person accounts, letters, maps, broadsides, and other original documents can result in very successful research projects Results from the Jamesville High School project suggests that secondary students in rural areas can be successful in using primary source documents to examine contrasting points of view and for drawing reasonable conclusions related to a carefully framed research question.

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16. Many thanks to Mrs. Kaye Dotson and Ms. Cynthia Grimes at Jamesville High School, Martin County North Carolina.

The Question is the Answer to Understanding
Carol Koechlin
Sandi Zwaan

'What an important task we have...to create learning that compels our students past twilight, imbued with a feeling of investigating something enormous!
Debbie Abilock Knowledge Quest 2004

This imaginative definition of the important work of educators says so eloquently what we hope readers will feel as they explore this book.

Teaching and learning is so exciting but ever so complex. For this reason alone we will attempt to keep it simple. We all want our students to be successful. We often measure success with a sigh of satisfaction when we realize, "they got it, they understand." Having said that we all know that there is nothing simple about the ability of the human mind to acquire and demonstrate understanding of skills, knowledge and ideas. Fortunately there are many scholarly studies and resources available to assist us in working out our own personal 'understanding' of what student understanding looks like, sounds and feels like. Each individual teacher will build and rebuild their own schema over and over as their experiences build and new challenges unfold.
Wiggins and McTighe in *Understanding by Design* tell us, "You understand it only if you can teach it, use it, prove it, explain it, or read between the lines."
Patricia Wolfe in *Brain Matters*, tells us, "The more we understand the brain the better we'll be able to design instruction to match how it learns best.....certain activities and strategies are more effective than others in increasing student understanding."
One point all the academic experts would agree on is that understanding is a process not a destination point. With this in mind we suggest that the most critical key to understanding is the 'question'. Without an inquiry catalyst student learning would be forever stuck in memorization and recall gear. It is the question that stirs the intellect, wakes up the neurons and provides the stimulus for students to do something with the raw numbers, facts and data they have gathered or been presented with. The Question can be prompted by both the curiosity of the student and the instructional intent of the educator. Both sources of questions are necessary if students are to learn and ultimately reach real understanding of topics and issues.

The Question is the answer to understanding.

Questioning is often thought to be an innate skill right up there with eating and walking. If you think about it though eating and walking are nurtured skills. So it is with questioning. In spite of the fact that our wee kindergarten students arrive at school bursting with 'why' and 'how come' questions, by the time they are in middle school many have lost this delightful and valuable curiosity. They are so used to answering teacher questions, worried about marks and giving the 'right' or expected answer, that they are now stuck in answer gear. How can understanding ever be achieved in this atmosphere? It is not surprising that some students in the middle years become very jaded about school and feel it has no relevance for them. They are tired of answering what we will call 'fake' questions generated by the need to cover curriculum content. We are not

saying that teachers should not develop questions for students to answer. These questions are a necessary component of teaching students how and when to question. What we are saying is just try letting go, put the spoon in their hand and see what happens. It is not so difficult to turn the tables and teach students how to develop 'real' questions that uncover personal understanding for them. Allowing students the exhilaration of learning in an environment where their questions are valued and celebrated will reap rich rewards. When students have some ownership of their learning experience, enthusiasm, effort and efficacy will be generated.

Motivation is part of our rationale for teaching students to question. Our main objective is the chemistry that takes place between questions and understanding. The number one reason that many research projects in classrooms are ho-hum bristol board displays or plagiarized reports is because they are driven by the 'all about' syndrome. It is very easy to fix this! If you really want your students to demonstrate their personal growth and understanding through assigning research projects then they must process the data they have gathered through the lens of a good inquiry question or challenge.

The mere formulation of a problem is far more essential than its solution, which may be merely a matter of mathematical or experimental skills. To raise new questions, new possibilities, to regard old problems from a new angle requires creative imagination and marks real advances in science.
Albert Einstein

Students cannot be expected to think critically and creatively about the ideas and knowledge of others unless they possess that magical chemical ingredient, the question, to start kick the process. The question can take the form of an inquiry question or statement. It could be a challenge, problem to solve or a decision to make but it must be there or the assignment becomes an exercise in pretend research. We all know the result - cut, paste and plagiarize!

The information available to students today renders it impossible to approach learning without questioning skills. Vast volumes of data available today on any given topic can only be managed and analyzed by the information literate. Educating students for the 21st century requires educators to teach students how to be critical and creative users of information. Neither of those attributes can be accomplished unless students are also effective questioners.

"Once you have learned how to ask relevant and appropriate questions, you have learned how to learn and no one can keep you from learning whatever you want or need to know."
Neil Postman and Charles Weingartner

Questioning also plays a huge role in learning to learn. This kind of questioning is not as easy to define as the research question. These are questions that are often not voiced but mumbled inside our heads as we proceed with a task. Making students aware of these inner mumblings will help them develop metacognitive abilities. It is necessary to nurture these kinds of questions so that students have better strategies for interacting with text. It is the question that allows students to make the important self to text relationship.

Without the silent head question analysis of data and ideas would not take place. We can model these questions for students in think alouds and show them how we question in our heads as we read a newspaper article or a bill from the Hydro Company or examine an art object.

At first, I see pictures of a story in my mind. Then creating the story comes from asking questions of myself. I guess you might call it the 'what if - what then' approach to writing and illustration.
Chris Van Allsburg

Help students with the transition of becoming conscious of these silent head questions and controlling the quality of their quests by having them write questions down for a while. We offer several tasks in this book to help with this strategy.

The only questions that really matter are the ones you ask yourself.
Ursula K. Le Guin

Questioning skills will also equip students with the tools to self analyze. It is with self questioning that we assess our results and our effort as well as set goals for improvement. Again we need to model how this works and give students ample opportunities to drive their own bus.

Without strong questioning skills, you are just a passenger on someone else's tour bus. You may be on the highway, but someone else is doing the driving.
Jamie McKenzie

It is our belief then that questioning is at the very core of understanding. Every nugget of learning germinates from an investigation of some kind.

Questioning needs to be nurtured and developed at all ages and for all disciplines.

Questioning is an essential skill.

Questioning is the answer to understanding.

The Question is the Answer to Understanding

Increase learning and student achievement by elevating the level of investigation.

Curriculum Focus - Identify what it is you want students to know and be able to do as well as how students will demonstrate their understanding.

Rich Information - Gather the best resources available to support learning. Consider variety, readability, balanced perspectives, and accessibility.

Engaging Thinking - Design experiences for students to explore the topic with these rich resources and look for connections. These activities should spark their curiosity and wonderment about the topic as well as build background information.

Building the Question(s) -Ensure that students own the question(s).Provide opportunities and tools to help students design lots of questions until they find the *'just right'* question for them and/or their specific information need.

Deep Thinking – As students work with information the guiding question(s) will keep them on track and kick start critical and analytical thinking about the data they collect. This kind of analysis elevates thinking beyond just gathering and recording; cutting and pasting.

Deeper Understanding – Answering the question will ensure that students reach levels of synthesis. They will draw conclusions, solve problems, make decisions, invent, and create new meaning for themselves when their thinking is driven by their question. Deeper thinking based on effective questions eliminates the possibility of plagiarized reports!

So What ! Students must have opportunities to share their learning in an authentically with others for them to further value and understand the significance of their findings. They must have opportunities to transfer and apply their learning; to reach metacognition.

The cycle continues as students formulate new questions and/or decide to take action.

Questioning for Success

Carol Koechlin Koechlin@sympatico.ca and Sandi Zwaan hzwaan@sympatico.ca

How can questions and questioning elevate the quality research projects and student understanding?

- shift thinking from 'product' to 'processes'
- teach questioning skills
- move from assignments to 'teachments'
- build a culture of inquiry

Research without questions is 'fake' research

- all about regurgitation
- cut, paste and plagiarize
- fill in the blanks
- quote the experts

Research based on effective questions

- stimulates curiosity
- demands rich information sources
- guides and focuses research
- provokes deep thought
- prompts analysis and synthesis
- enables personal understanding
- encourages transfer

Three designs for developing understanding with questions

Student as Questioner

T provides exploratory activities to build background knowledge
T instigates activities to spur thinking
S experiments building questions until they have 'the just right' question
S conducts research with their question as guide

Teacher as Questioner

T poses an engaging question
S builds background knowledge with the question as there guide
T poses a higher level concept forming question
S works with information and ideas to achieve understanding

Teacher and Students as Question Partners

T designs an overarching question to frame the unit.
T provides exploratory activities to build background knowledge
T instigates activities to spur thinking
S experiments building questions until they have 'the just right' question
T brings class back to the unit overarching question

Bottom Line

Questions are the answer to building knowledge and understanding.

Power-up Your Inquiry Question

Question starters		Focusing questions			Looking for relationships	
Who	Discover	changes	types	kinds	significance	compare
What	Investigate	jobs	roles	importance	consequence(s)	contrast
When	Compare	purpose	structure	characteristics	project	cause
Where	Uncover	value	lifestyle	relationships	implication	effect
Why	Determine	function	defense	adaptations	connection	value
How	Examine	capacity	survival	conditions	correlation	analyze
Which...	Study	intent	result	infer	pattern(s)	
	Research		outcome	imply	trend(s)	

Use this checklist to review your inquiry question(s)

- ☐ Stimulates your curiosity
- ☐ Encourages you to dig deep for your information
- ☐ Challenges you to think about your discoveries
- ☐ Prompts you to analyze your findings
- ☐ Guides your research quest
- ☐ Keeps you on track
- ☐ Sparks your imagination
- ☐ Helps you to make personal meaning

Use one or more of the **focus** or **relationship** words in your question to give it research power. Brainstorm your question ideas and record your best efforts here.

Review your questions with the checklist above and record your inquiry question(s) here. Conference with your teacher and teacher-librarian before you begin your quest.

Question Builder Frames

Who is, are, was, were did, does can, could would, should will, might	
What is, are, was, were did, does can, could would, should will, might	
When is, are, was, were did, does can, could would, should will, might	
Where is, are, was, were did, does can, could would, should will, might	
Why is, are, was, were did, does can, could would, should will, might	
How is, are, was, were did, does can, could would, should will, might	
Why is, are, was, were did, does can, could would, should will, might	
Which..... is, are, was, were did, does can, could would, should will, might	

Information and Technology Literacy Framework

PreK-12

The Context of the Information and Technology Literacy Curriculum

A planned, systematic, ongoing and integrated curriculum for information and technology literacy represents a major paradigm shift from the way information and technology literacy programs are currently being delivered. The following chart illustrates the change in perspective that will lead to the type of program that must be in place to ensure that all students have the opportunity to learn and practice information and technology skills and competencies.

A New Perspective on Information and Technology Literacy (I&TL)

Moving From	Moving To
I&TL Curriculum as Local Initiative • Based on existing resources • Separate computer and library instruction • Often not districtwide	**I&TL Curriculum Based on State and National Standards** • Learning Resources and Information Technology Framework (now Information and Technology Literacy Framework) • *Information Power: Building Partnerships for Learning* • *National Educational Technology Standards for Students (NETS)* • *e-Learning: Putting a World-class Education at the Fingertips of All Students*
A Stand-alone Curriculum • Discrete skills taught • Stand-alone lessons • Developed by library media specialist(s) and/or technology teacher(s) in isolation • Implemented by I&TL professionals • Instruction is random, available to students on an uneven basis – not articulated K-12 • Tends to focus on the integration of information and technology resources • Rigid scheduling for I&TL facilities	**A Well-defined, but Integrated Curriculum** • Instruction integrated into and across content areas, K-12 • Developed by I&TL professionals in cooperation with other educators • Instruction implemented by I&TL professionals working with classroom teachers • Instruction is planned, systematic and ongoing for all students • Formal alignment with content areas • Focus is on student acquisition of I&TL skills and competencies • Flexible access to I&TL facilities and resources
Cooperation • Working cooperatively with teachers who are interested • Delivering I&TL instruction as requested	**Collaboration** • Working with all teachers • Working with all phases of the instructional process: planning, delivery and assessment
Personality Driven • I&TL instructional program works because of the person(s) running it • I&TL professionals in some schools, but not others – sometimes an entire level not served • Lacks administrative support	**Program/Curriculum Driven** • I&TL instructional program works because it has been embedded in the educational process • I&TL professionals in all schools • Strong administrative support
Student Competency/Performance Not Systematically Assessed • Grade-level benchmarks have not been defined • Assessment may occur within some lessons	**Student Competency/Performance Assessed** • Grade-level benchmarks or performance standards have been defined • Mechanisms for regularly assessing all students' competencies have been developed and implemented (e.g., assured experiences)

INFORMATION AND TECHNOLOGY LITERACY

By the end of Grade 12, all students will be independent, competent, responsible and confident users of information and technology and able to apply related strategies for acquiring basic skills and content knowledge, collaborating with others, communicating ideas, solving problems and pursuing personal interests.

PROGRAM GOALS

As a result of education in Grades K-12, each student will attain a level of information and technology literacy skills that will enable them to:

- Communicate information and ideas, conduct research, organize data and solve problems, and create original works;
- Demonstrate responsible, legal and ethical use of information and technology.
- Use effective and efficient strategies to explore and use a wide range of information and technology resources to gain knowledge, deepen understanding, make informed decisions and solve problems for educational, career and personal pursuits;
- Apply information and technology competencies to learning in the content areas;
- Locate, evaluate, interpret and synthesize information from print, nonprint and digital sources; and
- Use technology tools to enhance learning, increase productivity and promote creativity.

K – 12 CONTENT STANDARDS

1. Technology Use	Students will operate and use computers and other technologies as tools for productivity, problem-solving and learning across the content areas.
2. Responsible Use	Students will demonstrate the responsible, legal and ethical use of information resources, computers and other technologies.
3. Definition and Identification of Information Needs	Students will define their information needs and identify effective courses of action to conduct research and solve problems.
4. Information Strategies	Students will understand and demonstrate a command of information skills and strategies to locate and effectively use print, nonprint and/or digital resources to solve problems and conduct research.
5. Information Processing	Students will apply evaluative criteria to the selection, interpretation, analysis, reorganization and synthesis of information from a variety of sources and formats.
6. Application	Students will use appropriate technologies to create written, visual, oral and multimedia products to communicate ideas, information or conclusions to others.
7. Assessment	Students will assess the effectiveness and efficiency of their own choices and uses of information and technology for problem-solving and communication.

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Sample Enduring Understandings and Essential Questions, K-12

CT Information Technology Content Standards	Enduring Understandings	Essential Questions
Responsible Use: Students will demonstrate the responsible, legal and ethical use of information resources, computers and other technologies.	• The way you present and represent information is a reflection of your academic integrity.	• Why do I need to cite sources to give credit?
Definition and Identification of information needs: Students will define their information needs and identify effective courses of action to conduct research and solve problems.	• There are numerous ways to solve information problems. • The quality of the question determines the quality of the results. • Asking questions leads to identifying important problems to be solved.	• How do I find what I am looking for? • What makes a good research question? • How do I know what questions to ask? • Where do I read first? • What are the benefits of being a skeptic?
Information processing: Students will apply evaluative criteria to the selection, interpretation, analysis, reorganization and synthesis of information from a variety of sources and formats.	• Information is available in many formats; spoken, visual and written. • Information is the currency of meaning.	• How do I conduct research? • What plan do I use? • How is solving an information problem like the job of a detective? • What makes what I'm finding reliable? How can I be sure?
Application: Students will use appropriate technologies to create written, visual, oral and multimedia products to communicate ideas, information or conclusions to others.	• Information can be interpreted and manipulated. • Information skills require students to become independent learners.	• How do I make information work for me? • How does the way I present information shape the way it is received? • How can I use what I learn in the library to be more successful in the classroom? To be more successful in life?
Technology Use: Students will use technologies for productivity, problem-solving and learning across the content areas.	• The relationship between literacy and technology is transactional. • New literacies are multiple in nature and change rapidly	• What is the right tool for the job? • How does technology enhance my learning? When does it make it more difficult?
Assessment: Students will assess the effectiveness and efficiency of their own choices and uses of information and technology for problem-solving and communications.	• Students understand that all learning involves active participation and ownership.	• What is my job when I'm looking for information? • How do I know when I'm done? • What would I fix or change next time?

Determine Acceptable Evidence *How to evaluate whether the desired results have been achieved*	
Performance Tasks	**Other Evidence**
Create a portfolio of original writings from each genre which explains, persuades, teaches or entertains, to a specific audience, using criteria from each genre. (e.g., tall tales/falsehood, fables/moral, etc) Research and describe (orally, visually, power point) a fable/tall tale that changed/influenced people's perception of their world.	-Quizzes on specific elements from each genre discussed -Essay/John Collins Writing Assignments (effects of technology and media) -Identification quizzes on different genres -Portfolio of original writings -Portfolio self assessment -Research assignments -Presentation/peer assessment rubric

Stage 3: Develop Learning Plans

- Introduction to the Unit:
- Big Picture: Post Essential Questions-What does a culture's stories say about the people within those cultures? Why don't author's just say what they mean? What does this story have to do with me? What makes writing worth reading?

(rational) *EU#1 Literature captures or reflects the human experience and condition.*
Topics for direct instruction/discussion/debate, journal reflection, homework connection:
storytelling vs. written word?
cultural trends past and present?
how does media influence culture?

- Read selected stories from Aesop's Fables:
- Introduce morals

(rational) *EU#2 Literature sets us free to examine our own lives.*
Topics for direct instruction/discussion, debate, journal reflection, homework connections, writing assignments:
What can we learn about specific cultures through its literature?
What are the cross cultural effects?
(rational)*EU# The most powerful stories rely on more than word choice to convey a message.*

- Introduce folk tales, tall tales, legends, fairy tales-

Topics for direct instruction/discussion/debate: discuss cultural bias, tone, humor, personification, allusion, differences/similarities/commonalties
How are different cultures reflected through literature?

- Traditional Fairy tales vs. Modern-

Topics for discussion/direct instruction/debate: Compare/contrast, What are the cultural issues then and now? How are different cultures reflected through Fairy Tales?

Compare written works to animated production. How has technology influenced/changed the expansion, culture and audience of specific written works?

Unit Name: Fables, Fairy Tales and Folk Lore Unit	Estimated # of weeks: 3

IDENTIFY DESIRED RESULTS

What all students are expected to know, be able to do, and understand

Content Standard(s)

Lit 3 L: Understand how both readers and writers are influenced by personal, social, cultural and historical contexts. [NH]
Lit 3 C: Make connections between personal experiences, prior knowledge, and the characters and events in literature in order to accomplish various goals. (e.g., To make sense of society and one's place in it, to gain insight into the lives of past Americans) [NHEIAP, MK,NRD]
Lit 3 E: Know ideas, themes, archetypes and symbols that appear in various genres and literary texts [NH, E, MK NRD]
C 1 D: Understand influences on a reader's response to a text (e.g., personal values, perspectives, experiences) [NRD]

Enduring Understandings	Essential Questions
*Literature captures or reflects the human experience and condition. *Literature sets us free to examine our own lives. *The most powerful stories rely on more than word choice to convey a message. *Who you are influences how and what you write. .	*What does this story have to do with me? *What does a culture's stories tell us about the people? *What makes writing worth reading?

Knowledge and Skills

- Characteristics of a specific genre (e.g., personification, allusion, humor, persuasive techniques, bias) and apply knowledge.
- Apply language, style, tone, and structure appropriate for the characteristics of each genre and specific audiences.
- Interpret common writings (Aesop's Fables, Legends, Folk Tales, Tall Tales, Fairy Tales) to identify themes and characters.
- Explain how media and technology has influenced the expansion of fables/folk lore. (Disney)
- Explain where storytelling still exists today and how it is important in today's society.
- Describe how a fable/folk lore that describes how a specific story influenced people's perception of their world.
- Compare two cultures folk tales and explain how they represent their society's culture.
- Recognize organization of text as well as conflicts and resolutions

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Oklahoma Association of School Library Media Specialists Time Task Study

Judy Pitts Research Forum — AASL 2005

Nancy A.S. Miller — October 7, 2005 — Pittsburgh, PA

Data Analysis by project consultant, Nancy A.S. Miller, INTEConsulting, Inc. Lafayette, IN
Coordinated by Ellen Duecker, Tulsa OK Schools, with assistance of Barb Phrehm, OK State Dept. of Ed.
Research design and other sage advice provided by Dr. David Loertscher, San Jose State University

Premise: A decade of research, starting with Dr. Keith Lance's well-known "Colorado II Study," has shown that quality library media programs contribute to academic achievement and student success.[1] Many school libraries, however, remain so understaffed that they fail to achieve their potential to impact student learning. Staff reductions and program elimination, we believe, is often due to a lack of understanding of what professional librarians do. Successful school librarians support teaching and learning while they manage the day-to-day operations of the library media center when they have the assistance of clerical staff. This study sought to clarify the various roles of professional librarians and show how much time is contributed to each in a nominally staffed library that includes one or more professionals and one or more library assistants.

Goals: The study had four goals:

- Identify and organize descriptors of school library media roles and specific tasks.
- Measure the amount of professional and clerical time needed on specific tasks to provide quality services.
- Determine the balance and relationship between "professional time" and "clerical time" spent in quality library media programs.
- Develop a baseline profile of a school library media specialist and assistant for communication and reflective practice purposes. The results may also provide a piece of a rationale to support full staffing of school library media programs.

Methodology: Using characteristics of quality library programs described in Lance's Colorado Study, schools were identified by Ellen Duecker, Tulsa Schools, with the assistance of Barb Phrehm, Oklahoma Department of Education. Librarians from approximately 50 schools met in September 2004 to discuss the parameters of the project and review the checklist drafted by Ellen Duecker and David Loertscher before its final editing. I constructed an *Excel*™-based tracking tool based upon the final checklist.

Ultimately, twenty-two school librarians from Oklahoma and their library assistants participated in the main study, tracking their daily activities every third workday between October 2004 and January 2005 for a total of 15 "typical" days. Each school recorded the number of students who visited the library and the number of library materials used or checked out during each tracked day. They also submitted brief profile information about their schools and library programs concerning enrollment, number of teaching staff, hours that the library is open and contract hours for themselves and their library assistants. After data collection was complete, each participant was asked to respond to some reflective questions regarding the project and to share any "ah has" or "uh ohs" discovered as each one recorded or reflected upon their tracked data. In late spring of 2005, a smaller follow-up study with a group of six exemplary librarians who do not have assistants in their programs tracked their respective activities.

Most participants used the customized spreadsheet checklist that listed 60 separate tasks then automatically added the hours and minutes to reveal total on-task hours for the day. The tool also provided space to record notes about unusual or other "undefined" activities as well as some graphs and charts to visually represent the individual's responses in various activity comparisons.

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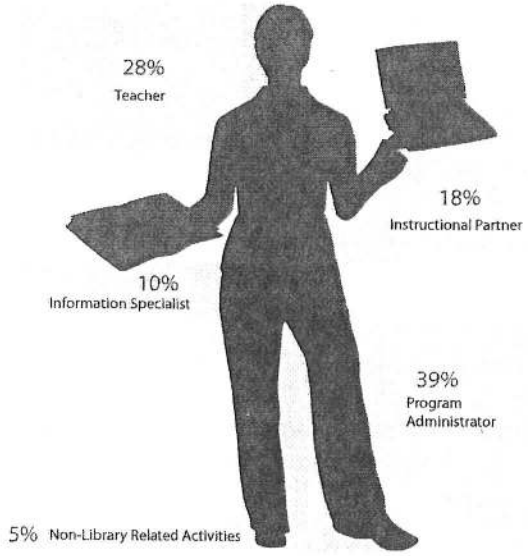
[1] Lance, Keith C., Marcia J. Rodney and Christine Hamilton-Pennell. How School Librarians Help Kids Achieve Standards: The Second Colorado Study. San Jose, CA: Hi Willow Research and Publishing, 2000.

Data Analysis: Once all completed instruments were submitted, we extracted the data and compiled a "composite picture" of the school librarian and the school library assistant based upon the four roles identified in chapter one of *Information Power: Building Partnerships for Learning* (ALA/AECT, 1998):[2]

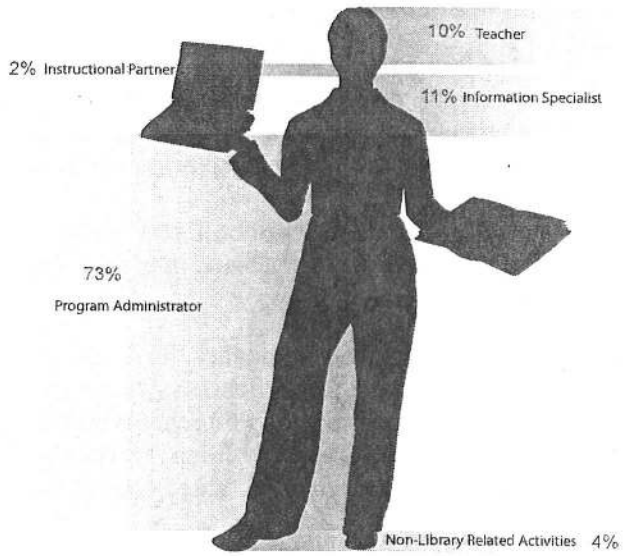
Teacher
Instructional Partner
Information Specialist
Program Administrator

We also provided for that ever-present catchall category of "Non-Library Related Duties."

Composite Results: Since the study involved a relatively small number of schools and personnel, we feel the results can only provide a general basis or description that should be honed through additional trials. The composite *Librarian* and the *Library Assistant* profiles for the Oklahoma Time Task Study 2004/2005 are illustrated below.



Roles of a Librarian
who has an assistant



Roles of a Library Assistant

Clearly in the case of these schools, all having professionals and assistants, the professional's time is much more evenly spread across all four roles than is the library assistant's time. "Program administrator" encompasses all materials handling, circulation, and virtually all of the other clerical tasks associated in the lay person's mind with a librarian's job. Therefore, the vast majority of the library assistant's time is spent in this category. This same major category, however, also includes highly professional tasks, requiring knowledge and skills that typically only certified librarians have, in categories such as: Collection Development, Advocacy/Outreach, and Program Development. The charts that follow show the time on task for each of the subtasks identified in "program administrator" role for the librarian and the assistant. Compare the emphasis of effort shown by each "composite" worker.

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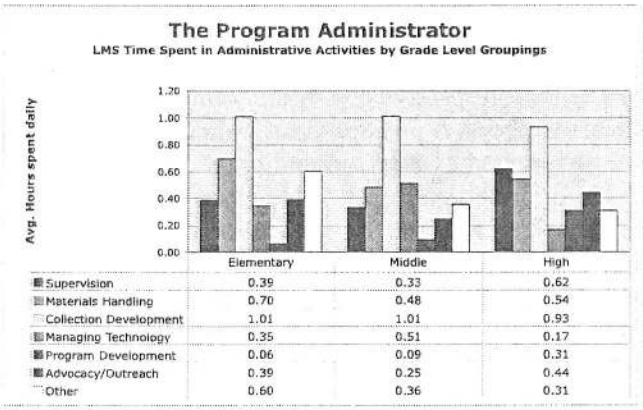
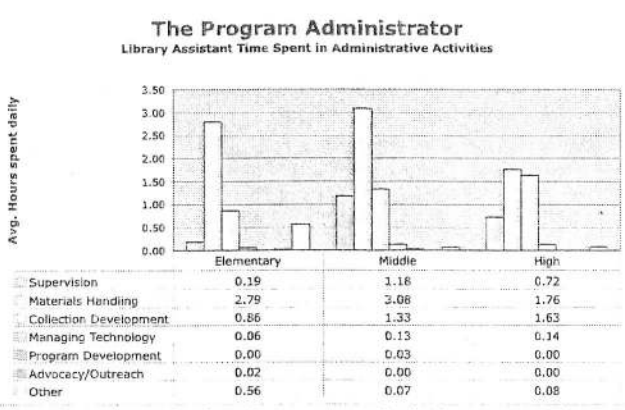
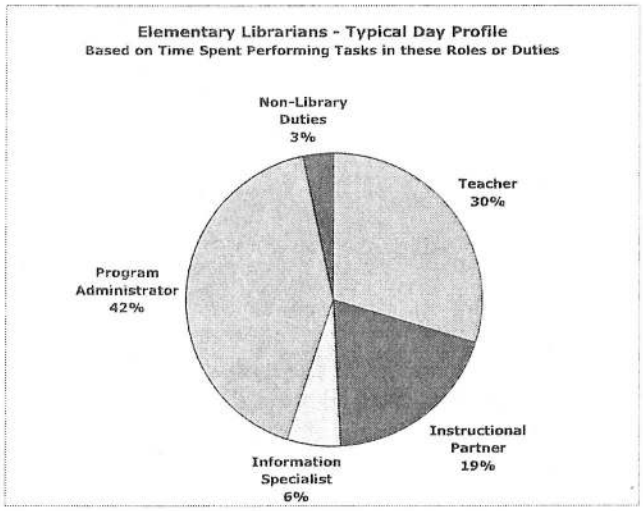
[2] Excerpted from Chapter 1, "The Vision," of *Information Power: Building Partnerships for Learning*. Copyright © 1998 American Library Association and Association for Educational Communications and Technology.

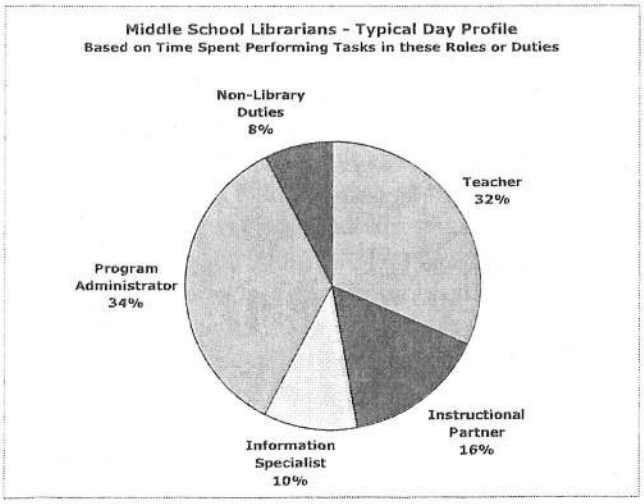


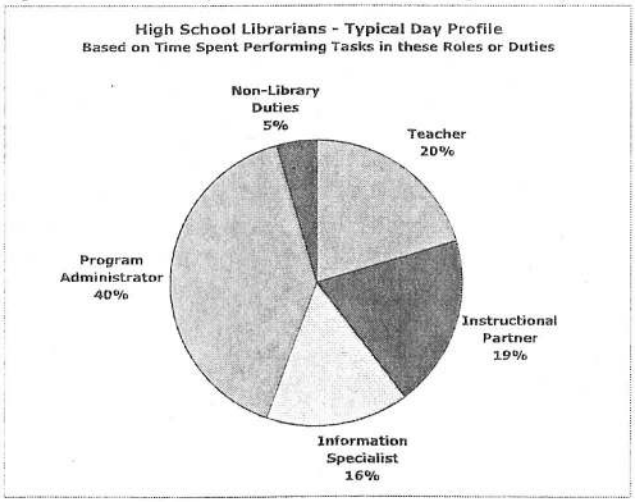


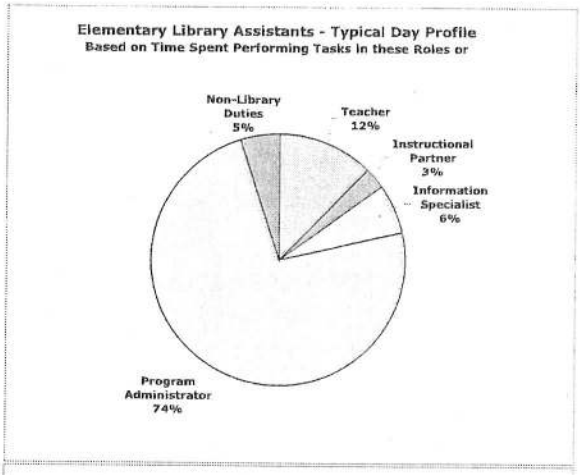
Professional librarians in the OK study spent the majority of their time in the "program administrator" role doing collection development work, while the assistants/clerks spent the majority of their time in materials handling which includes processing, circulation and shelving of books and other library holdings. Interestingly, the assistant's role in collection development was incrementally higher as we look from elementary to high school environments, while the library professional spent more time in a supervisory capacity (of library workers as well as student patrons) at the high school than did the assistants. Also notable, was that library professionals spent more time in "managing technology" than did library assistants in every grade level group.



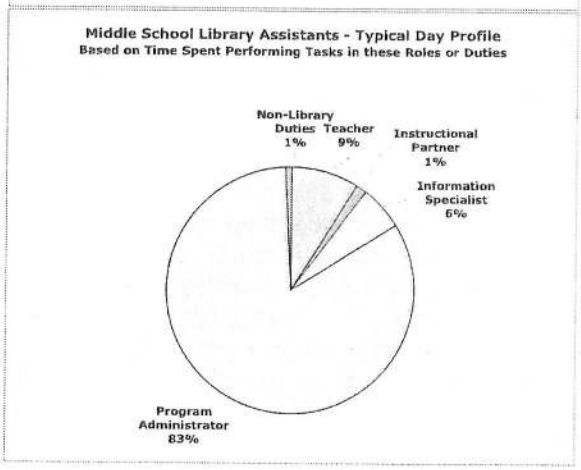
When breaking down the data by grade level categories it must be noted that while there were eleven elementary school programs represented, there were only five middle school and six high school librarians participating. Our confidence that the results show a "typical" profile is greater for elementary than for the other grade levels. Nevertheless, there were a few notable variations among the composite practitioner at elementary, middle and high school levels. Examine the charts to the left and below to see the variations in time spent among the major roles of librarians. In each grade level there was variation in times reported by individual librarians. The greatest range was found among elementary reports in "teacher," "instructional partner" and in "program administrator" roles. The middle school had the most variation in the "non-library related duties" category and the high school librarians showed the greatest range in the "information specialist" role. (See addenda for a range table.)

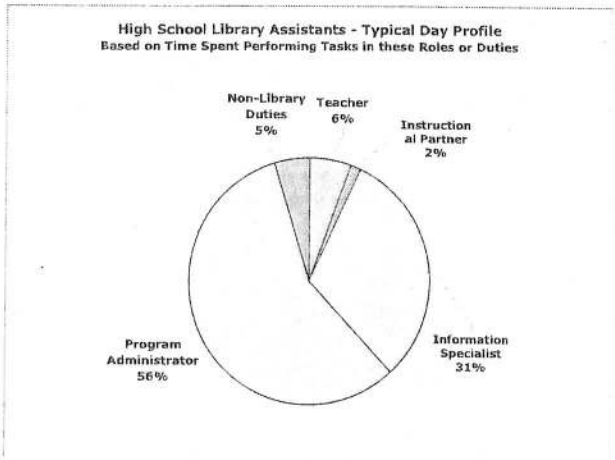






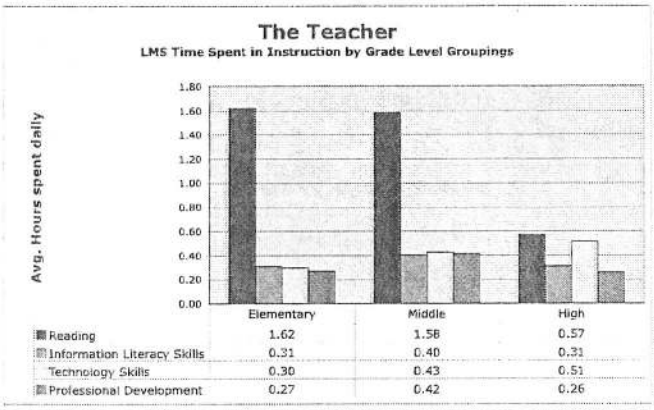
Among their respective library assistants, the most notable variation is perhaps the significant amount of time reported by high school library assistants in the "information specialist" role. Otherwise, the middle school assistant showed the least divergence from the "program administration" tasks and the elementary library assistant was more likely than her peers at other grade levels (12% of time at elementary compared to 6% at the high school) to act in a "teacher" role.

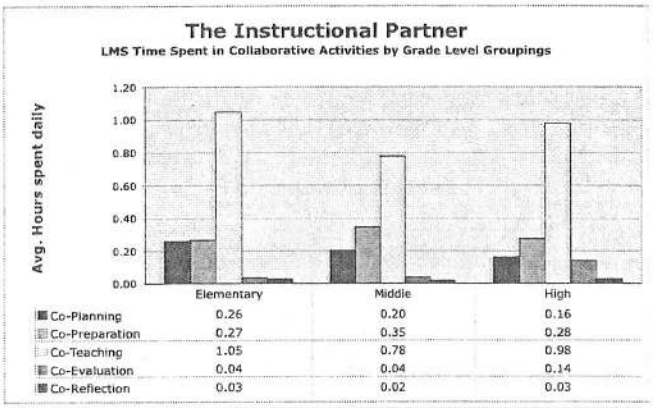


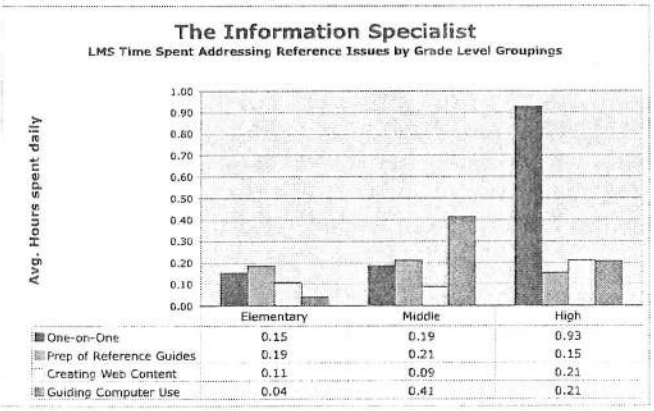


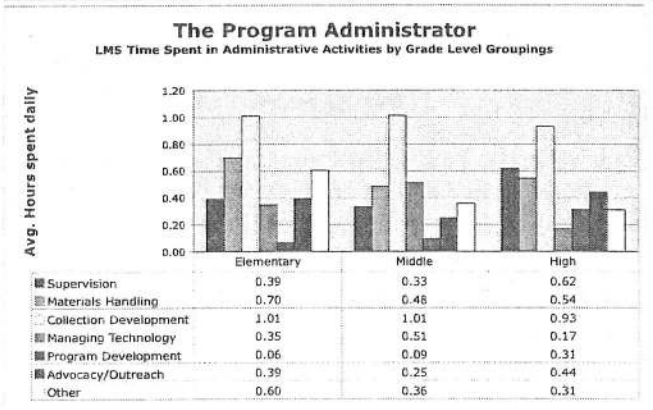
The Four Roles: The breakdown of activities within each of the four major roles also shows some variation of emphasis across the grade levels. Not surprisingly, in the "teacher" role, elementary and middle school librarians spent the vast majority of their time engaged in reading development programming, but that activity area sharply dropped off in the high school environments. As an "instructional partner" (the collaboration category) at each grade level, the majority of the time was spent in "co-teaching" activities (47 to 63 minutes daily), with a only a small amount of time spent in co-planning of instruction (10 to 16 minutes daily) and co-evaluation of student learning (2 to 8 minutes daily) at any grade level.

Each of the following charts shows the average time spent in each subtask by the composite librarian in the respective grade level groups. As an "information specialist", little time is spent overall by elementary librarians (less than 30 minutes daily) and a significant amount of the high school librarian's time is spent in this category (1½ hours daily). One-on-one information skills help jumps up most sharply at the high school. The middle grades librarian spends most of the time within this category in guiding students in computer use, but even then reported less than 25 minutes daily. Each grade level's composite librarian in the role of "program administrator" spent most of his/her time in the collection development task of that category. (Note: This subcategory was one earmarked as "problematic" for participants and was tagged for a change in task descriptors for future studies, because it blended too many clerical tasks with professional tasks.) The high school librarian showed the most balance across all subtasks in that category, doing the most work of any grade level librarian in advocacy and program development, the latter of which was scarcely noted at elementary and middle grade levels.

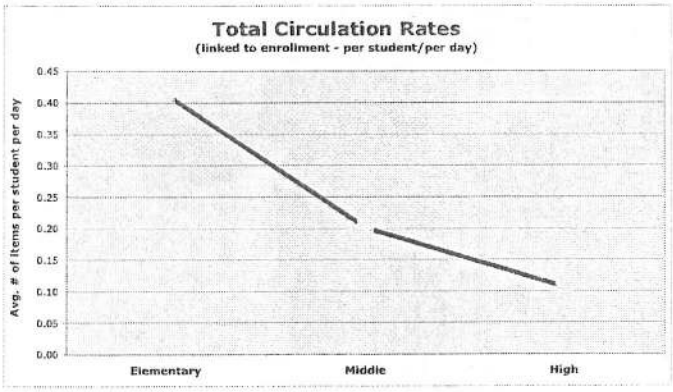


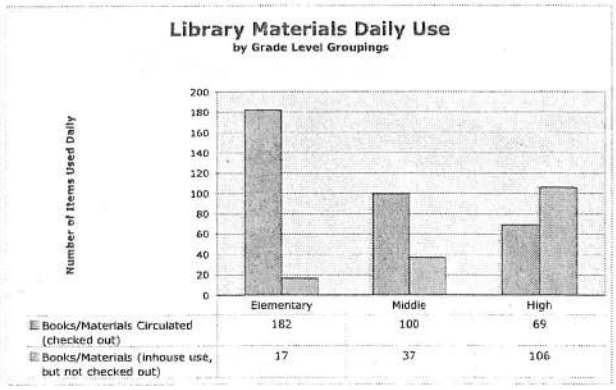




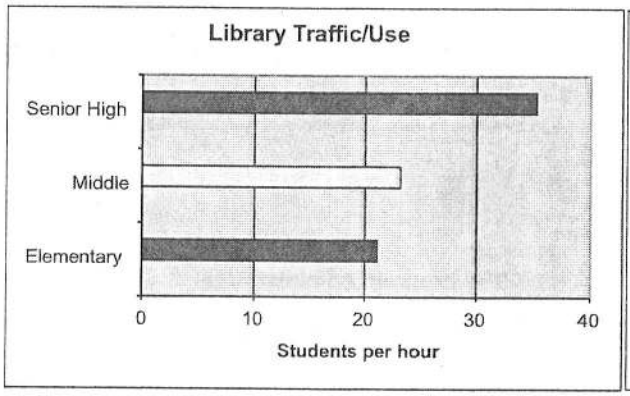


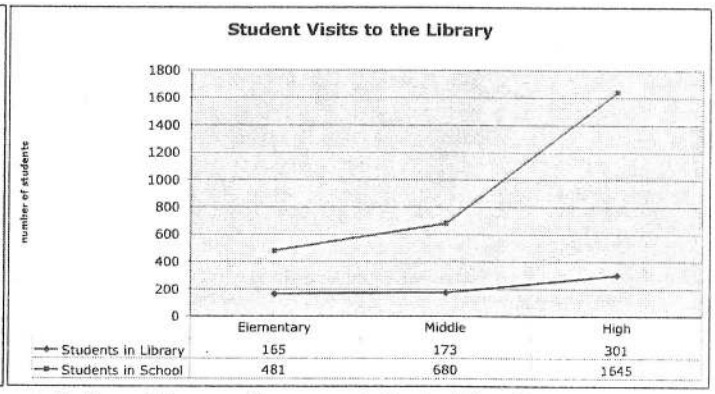
Program Statistics: Since participants recorded the enrollment numbers for their buildings and the number of materials used while in the library or checked out for home or classroom use, we were able to confirm the widely known (but sad) truth that per student circulation rates drop sharply as students matriculate to upper grade levels. In elementary libraries, the circulation rate was .41 books per students per day (counting both materials used in house and checked out); at the middle school it dropped to .20 books per student per day and at the high school another drop to .11 books per student per day was found. It is clear that the way students use the library changes as they move up in grades; the high school use shows many more books used in house than were checked out.





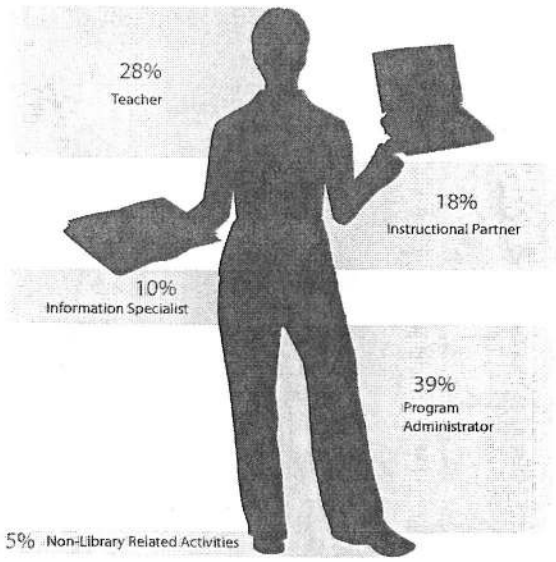
Though more students at the high school visit the library each hour (35) compared to the middle school (23) and elementary (21), the total represents a much smaller percentage of the school population (18%) when compared to elementary students (34%) who visit the library daily. The charts that follow illustrate this data disparity when shown without and then within the context of student enrollment.



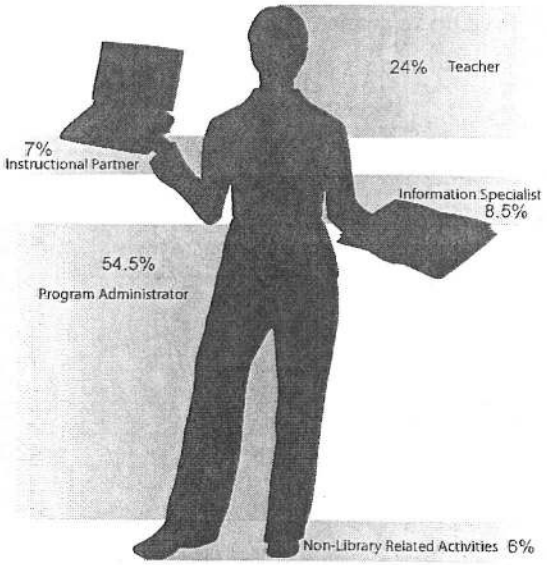


Library spending also seems to parallel library usage statistics with spending per student at the elementary averaging $29 per student compared to $20 per student at the middle school and only $14 per student at the high schools in the study. (Spending per pupil combined all sources of income from federal, state and local funds as well as any fundraising or grant monies.)

In the late spring of 2005 we followed up with a similar but smaller study of six Oklahoma librarians who are working in schools that don't have a library assistant. Since there is much to do in the library program and only so many hours available to do the work, we wanted to get a general idea of what shifts occur among the professional roles. Though only a small set of data was retrieved, it is obvious that the big "loser" category is the role of "instructional partner." As the figures below portray, the time spent is diminished by eleven percentage points, which, in turn, shifted to the role of "program administrator," the category where library assistants typically spend most of their time. The sad news for schools without assistants is that the roles of "teacher" and "instructional partner" are likely to contribute the most to improved student achievement, but are certain to be shortchanged when trying to go it alone. Based on this trial's data, the amount of time in these two roles combined was diminished by over 15 percentage points when a library assistant was not on staff.



Roles of a Librarian
who has an assistant



Roles of a Librarian
who has no assistant

Before & After School: The instrument used for tracking time also noted tasks that were completed before or after contracted time. We found that having a library assistant or not did change the amount of "extra time" librarians spent on the job. In each case, the average time above and beyond contract hours was just over one hour per day, making a typical day that averaged just over 9 hours.

The Intangibles: Though my personal role in the project revolved mostly around the "hard cold facts" and numbers involved, profiling what the library professional does cannot be completely reduced to numbers and concrete evidence. Reflections from participants of the study were concerned that we wouldn't capture the "intangibles" such as the relationships or rapport developed between the librarian and his/her classroom teacher colleagues. Future studies may seek to capture this important data to add to the mix of what makes up a "typical" or "exemplary" school librarian.

Happy effects of doing this project have occurred for many of the participants. Several librarians said that tracking tasks made them more conscientious of what they chose to do with their time; they more often chose to do what they felt were the most professional tasks that needed doing. Some said they were shocked at how many redundant, low-level tasks they found themselves doing, and subsequently made the effort to transfer such activities to the responsibilities of their assistants, student workers or volunteers. Other participants were pleasantly surprised at how much they packed into a day's work; how their multi-tasking skills paid off in productive ways. The majority felt that the experience of this project was a positive one and were interested in continuing to monitor the time they spend to generate reports for their own reflective practice and goal setting. They saw the value in sharing the resulting profiles with their administrators and colleagues to help communicate how they, as librarians, contribute to student learning in their schools.

Opportunities for further study: This initial foray into the issue of "how do school librarians spend their time" in Oklahoma raised several additional questions worthy of future study, some of which are:

- Would similar studies in other states, communities, or districts yield similar results?
- Is there a relationship between time-on-task in the instructional partner role with the school's test scores?
- Would a larger study of librarians without assistants vs. those with assistants render similar findings?
- If randomized by the practitioner, how many days of tracking would it take to yield a truly valid profile?
- What is the work profile of a library assistant in a school with no professional librarian?
- What is the cost/benefit ratio of professional librarians with assistants compared to those without?

Nancy Everhart, after reviewing 30 years of research and studies completed between 1969 and 1999 concerning how librarians spend their time, suggests more time on task studies be conducted that use "self-reporting at either random or fixed intervals using a standardized list of tasks."[3] Simply estimating, journaling and surveying people about time spent on the job have been found to render inaccurate results, and it would be a prohibitively expensive to hire official observers to follow around and track each librarian's work. To ensure accuracy of data gathered, however, it is important in self-reporting to actually record the time spent as soon as possible after each task is completed. In the Oklahoma study, the participants were asked to enter data on their checklists at least twice daily. Even then, they found themselves struggling to remember and sometimes counting some activities redundantly across reporting categories. It was noted that the process of accurately tracking time itself requires some practice and a raised personal awareness of each unique task performed among the many that comprise the day of any given library worker. At the conclusion of this study, we revised the categories and task descriptors for future trial use to help eliminate some confusion found during this study and better reflect the jobs at hand.

What you can do: Ask yourself, "Is my perceived notion of how much time I each spend among the professional roles in our library close to the reality?" Consider doing a little action research in your school or district to create a valid time on task profile of your work. Keep track of librarian and/or clerk activities over a random set of days, then analyze the results. What are the gaps between perception and actuality?

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[3] Everhart, Nancy L. "School Library Media Specialists' Use of Time: A Review of the Research." *School Libraries Worldwide*, Vol. 6, No. 1, 2000, p.53-65.

Addenda

1. Table of percentages of time spent in each subcategory activity (Oklahoma Time Task Study – 2004/2005)

Professional School Librarian with support of a Library Assistant				
Teacher Librarian	**Elementary**	**Middle**	**High**	**Composite - All**
Reading	19%	18%	7%	16%
Information Literacy Skills	4%	5%	4%	4%
Technology Skills	4%	5%	6%	5%
Professional Development	3%	5%	3%	4%
Instructional Partner				
Co-Planning	3%	2%	2%	3%
Co-Preparation	3%	4%	3%	3%
Co-Teaching	12%	9%	12%	11%
Co-Evaluation	0%	0%	2%	1%
Co-Reflection	0%	0%	0%	0%
Information Specialist				
One-on-One	2%	2%	11%	4%
Prep of Reference Guides	2%	2%	2%	2%
Creating Web Content	1%	1%	3%	2%
Guiding Computer Use	0%	5%	2%	2%
Program Administrator				
Supervision	5%	4%	7%	5%
Materials Handling	8%	5%	6%	7%
Collection Development	12%	11%	11%	12%
Managing Technology	4%	6%	2%	4%
Program Development	1%	1%	4%	2%
Advocacy/Outreach	5%	3%	5%	4%
Other	7%	4%	4%	5%
Non-Library Related Activities	3%	8%	4%	5%
Total . . .	100%	100%	100%	100%

School Library Assistant				
Teacher Librarian				
Reading	12%	6%	1%	8%
Information Literacy Skills	0%	1%	0%	0%
Technology Skills	1%	3%	4%	2%
Professional Development	0%	0%	1%	0%
Instructional Partner				
Co-Planning	0%	0%	0%	0%
Co-Preparation	2%	1%	0%	1%
Co-Teaching	0%	0%	2%	0%
Co-Evaluation	0%	0%	0%	0%
Co-Reflection	0%	0%	0%	0%
Information Specialist				
One-on-One	1%	2%	3%	2%
Prep of Reference Guides	3%	1%	1%	2%
Creating Web Content	0%	0%	0%	0%
Guiding Computer Use	2%	5%	29%	9%
Program Administrator				
Supervision	3%	16%	9%	8%
Materials Handling	45%	43%	23%	40%
Collection Development	14%	18%	21%	17%
Managing Technology	1%	2%	2%	1%
Program Development	0%	0%	0%	0%
Advocacy/Outreach	0%	0%	0%	0%
Other	9%	1%	1%	5%
Non-Library Related Activities	5%	1%	4%	4%
Total . . .	100%	100%	100%	100%

Percentage of Time Spent (average "typical" day)

Professional School Librarian	without support of a Library Assistant			
Teacher Librarian	Elementary	Middle*	High*	Composite - All
Reading	15%	16%	3%	13%
Information Literacy Skills	5%	5%	0%	4%
Technology Skills	1%	9%	10%	4%
Professional Development	4%	3%	5%	4%
Instructional Partner				
Co-Planning	1%	2%	0%	1%
Co-Preparation	1%	2%	0%	1%
Co-Teaching	3%	9%	5%	5%
Co-Evaluation	0%	1%	1%	1%
Co-Reflection	0%	0%	0%	0%
Information Specialist				
One-on-One	1%	2%	4%	2%
Prep of Reference Guides	1%	2%	0%	1%
Creating Web Content	2%	1%	7%	3%
Guiding Computer Use	2%	3%	8%	3%
Program Administrator				
Supervision	9%	22%	14%	13%
Materials Handling	22%	5%	13%	17%
Collection Development	13%	7%	9%	11%
Managing Technology	0%	0%	6%	1%
Program Development	0%	2%	0%	1%
Advocacy/Outreach	2%	4%	4%	3%
Other	11%	0%	10%	8%
Non-Library Related Activities	8%	5%	0%	8%
Total . . .	100%	100%	100%	100%

**only one librarian in each middle & high school group*

2. Variations in Profiles (among Major Roles): Where the librarian spends his/her time is dependent upon many factors. School traditions, administrative leadership, size, population attributes, community culture, and personal preference may all play a part in defining what any given librarian does. Regardless, all librarians have significant levels of autonomy and control over their respective workloads. Participants in this study were all nominated as exemplary school librarians with exemplary school library programs. Even so, there was a wide variation among the participants in the percentages of times reported as spent in the four major roles. The table below provides more specific data in this regard.

Percentage of time spent in various roles (Range of values in Elementary, Middle & High School Groups)
(Green indicates widest range for that role)

Major Roles	Elementary Schools		Middle Schools		High Schools	
	Low	High	Low	High	Low	High
Teacher	0%	51%	20%	40%	9%	33%
Instructional Partner	3%	40%	5%	36%	6%	33%
Information Specialist	1%	13%	3%	19%	0%	30%
Program Administrator	29%	51%	26%	46%	30%	45%
Non-Library Related Duties	0%	10%	1%	28%	0%	11%

3. Selected comments from Oklahoma Time on Task project participant reflections:

"This verified that I am busy from the time I walk in the door—pretty much on task all day." ~ Christy Hefner, Madison Elementary

"I was surprised at the amount of collaboration I actually do. Because so often this is informal, keeping track of it helped me realize I am reaching my goal of increased collaboration." ~ Carolyn McClure, Nimitz Middle School

"I was surprised by the amount of time after school hours that I spent selecting books or preparing to teach a class. I also serve on district committees and am preparing a state conference presentation." ~ Brenda Price, Edmond Memorial High School

"It was a bit surprising to see how much multi-tasking is essential to get through the day. I was so surprised to see how much is accomplished despite seemingly endless interruptions. Because of reviewing the data, "I now do less clerical, leaving that to my assistant, and am spending more time working on lessons." ~ Bonnie Brown, McClure Elementary

"So much time is spent on circulation and shelving. It's so repetitive." ~ Nicole Winters, Lukfata Elementary

"I was thrilled to realize that I do more collaboration than I thought because so much is done in brief meetings with teachers throughout the day." ~ Jayme Seat, Jackson Elementary

"I was surprised to see how much I use student volunteers. ~ Stephanie McDaniel, Marshall Elementary

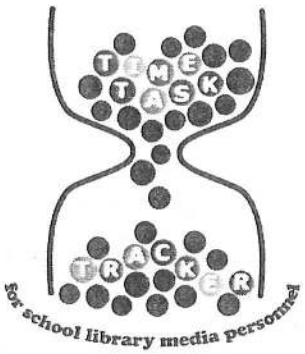
"The data does not represent the rapport built between the library media staff and patrons. . . Because of the relationships, we are able to do more for the staff and students." ~ Lori Gossen, Van Buren Elementary

"I realized the time I spent on teaching information literacy is relatively short, I still need to focus on this area." ~ Kay Childers, Sequoyah Elementary

"Measuring intangibles is impossible, but often the intangibles are the spirit and heart of the job!" ~ Mary Ann Robinson, Cheyenne Middle School

Special thanks go to the 50 librarians and library assistants who gave their time and effort to this endeavor.

The composite librarian images were designed by Early Bird Design Group. (www.earlybirdcreative.com)



Time Task Tracker: for School Library Media Personnel
Developer: Nancy A.S. Miller

What do you do all day? Do you spend the bulk of your day routine clerical tasks or do you focus on professional activities such as collaborative planning and information literacy development? Use this Excel-based tool to keep track of what you and/or your library assistant does. The program immediately compiles and communicates your work profile in colorful charts and tables. Reflect upon the results to set personal and professional improvement goals to create a better balance of activities among your roles as *Teacher*, *Instructional Partner*, *Information Specialist* and *Program Administrator*.

Requires Microsoft Excel™ 2000 or higher
Available from LMC Source at http://www.lmcsource.com
Pre-order at the LMC Source booth in the exhibit hall and get a 20% discount.

Contact the presenter, Nancy A.S. Miller, at

INTEConsulting, Inc.
4035 Dayton Road
Lafayette, IN 47905-9358

V: 765.296.9257
F: 765.296.9256
E: millern@mintel.net

Handouts, instruments, and the presentation file for this session can be downloaded at:
http://www.elocker.org
UserName: **AASL05**
Password: **handouts** *(case sensitive)*

(look for the "OK Time Task" Folder)

Media Meets the Challenge

How School Libraries in the Peach State Impact Student Achievement

The Georgia Library Impact Study

Executive Summary

October 2005

Peggy Milam

Evelyn Thames

Draft

With Cobb County School District
Cobb County Association of Library Media Specialists
Georgia Department of Education
Georgia Library Media Association
Cobb County Media Leadership Team

Introduction

School libraries have faced multiple challenges in the last decade. Serious budget cuts and staffing and scheduling shortages across the nation have alarmed even the most secure school districts. At the same time that budgets have been drastically cut and are even further threatened for the 2005-2006 school year, Georgia schools are facing the fourth fastest growing student population in the nation, according to the National Center for Education Statistics (http://nces.ed.gov/). With the cost of print materials rising each year and the increasing demand for technology resources in school libraries, Georgia media specialists are caught between the need for increased services and resources and the decrease in funding which provides those services and resources. Without adequate funding, how do library media specialists in Georgia continue to provide the exemplary services to our ever-growing learning communities that will continue to positively impact student achievement? How do library media centers acquire the current resources necessary to remain accredited by the Southern Association of Colleges and Schools?

The purpose of this study, "Media Meets the Challenge," is two-fold: 1) to provide research that conclusively proves the role of Georgia school library media centers in increasing student achievement and 2) To rally legislative support for increased funding designated for media centers to maintain staff and to purchase adequate current resources to support state curriculum and informational needs. To this end, the following guiding questions have been developed: How do school library media centers in Georgia impact student achievement through the integration of technology resources? What is the current level and impact of collaboration with staff and community in Georgia school library media centers? How do Georgia school library media centers handle staffing and scheduling to meets patron needs? How do school library media centers in Georgia provide equal access to all patrons, including special needs groups?

One of the unique features of this project is the cooperative consortium of educational media groups who have pledged cooperative support. Thus, the Georgia Library Media Association and CCALMS is publicizing the survey through its regular meetings, website and publications to state administrators. The Cobb County Media Leadership Team is helping to develop the survey by editing and field testing survey questions. The online dissemination of the survey through the Georgia Department of Education website will sharply reduce costs normally associated with such an initiative. Recognition of the necessity to document the positive impact of active Georgia media centers on student achievement spans the state.

Goals

The goals of this project are to:

1. Survey school library media specialists in 183 districts throughout the state of Georgia as to levels of staffing and scheduling practices, levels of services provided, targeting patrons with special learning needs, levels of collaboration between media specialists and their learning communities , levels of technology integration available through the media center;
2. Present the findings of this research to state legislators as a compelling argument for restoring funding which will fully support Georgia school library media centers

Planned Activities: Collaboration from a consortium of groups including, but not limited to, the Cobb County Association for Library Media Specialists, the Cobb County Media Leadership Team, the Georgia Library Media Association, the Georgia State Department of Education, the State University of West Georgia Media and Instructional Technology Department, the Georgia State University Media and Instructional Technology Department, and the Georgia state Regional Educational Service Agencies have agreed to provide support and resources to back this study.

Literature Review

A review of the literature indicates that instructional a well-stocked, well-staffed library media center, can and does improve student achievement in spite of individual differences in income, gender, and school size. The Library Research Service's landmark study in Colorado (Lance, et. al., 1993) has currently been replicated in multiple states (Alaska 2000; Pennsylvania 2000; Massachusetts 2000; Texas 2001; Oregon 2001; Iowa 2002; New Mexico 2002; Michigan 2003, Minnesota 2003, Missouri 2003, Michigan 2003, Florida 2003, Ohio 2003, North Carolina 2004, Delaware 2005, Illinois 2005) with similar results. Each study's common findings conclude professionally trained media specialists make a difference in student achievement, but also that school library media centers must be adequately budgeted and staffed, and

must ensure that information resources extend beyond the walls of the media center into the classrooms and even students' homes. Lance (2001) found that media specialists play a unique role in enhancing student achievement, and, as such, must be embraced by the staff and supported by the administration. Moreover, he concludes that technology is an essential part of a successful media program.

Methodology

The purpose of this survey was to provide evidence that the excellent school library media programs in the state of Georgia positively impact student achievement. Survey data will provide a powerful tool for negotiating with the state legislature for increased levels of funding for resources and personnel. This survey was designed for responses from both building level media specialists and administrators concerning the library media center program in the local school setting. Administrators did not respond to all questions.

The survey was posted online in March, 2005. Notices were sent via the GaMedia list-serv and through e-mail contact lists to ask local school media specialists and their administrators to participate. Reminders were posted and phone calls were made to districts not responding to the survey. The final results were collected in July, 2005.

Survey Instrument

This instrument was designed as a web-based survey and was created as an html document that was hosted on the Cobb County School District (Marietta, Georgia) web server. The original document was posted as five linked pages. The survey consisted of fifty-four multiple choice questions and five open-ended question, for a total of fifty-nine questions with 252 possible answers. Questions were designed by the research team and vetted among representatives of the Georgia Library Media Association.

Preliminary survey instruments were vetted by the Media Leadership Team and CCALMS, both of Cobb County School District in Marietta, Georgia. Input from both groups resulted in revisions of the original survey instrument. While the multiple-choice questions allowed for quantitative data collection, the open-ended question allowed for qualitative data collection as well.

Results

Preliminary findings were shared with National Board certified school library media specialists at the National Board for Professional Teaching Conference in Washington, D.C. in July, 2005. A summary of results was shared at the Treasure Island Research Retreat on October 5 and 6 in Pittsburgh, Pennsylvania. Additionally, a report was issued to the Georgia Library Media Association in October and presented to attendees of the Council of Media Organizations in Columbus, Georgia on October21. A full summary was issued to the Cobb County School District at the Fall media specialist in-service on October 14, 2005.

Highlights of the Georgia Library Impact Study Results

- The top five districts responding were Cobb County (12%), Gwinnett County (9%), DeKalb County (6%), Fulton County (5%), and Walton County (4%).
- The largest number of Title 1 schools, or 63%, according to survey respondents, were small elementary schools in urban areas.
- School library media specialists responding to the survey were a highly qualified group of educators.
- Across the state, school library media specialists are collaborating with teachers, other school library media specialists, public librarians, parents and community members, and students and volunteers.
- The media center budget is a concern statewide. Statewide, school library media specialists actively seek additional funding from many sources.
- Georgia media specialists are spending up to one-fourth of their budgets on technology or non-print resources.
- The majority, or 56%, of Georgia media centers are staffed by at least one full-time professionally trained and credentialed school library media specialist and 11% are staffed by two full-time credentialed media specialists.
- Georgia media centers depend heavily upon volunteer hours to fill staffing and scheduling needs.

- Media specialists are often called upon to perform other duties in the school.
- Flexible scheduling is not all-inclusive in Georgia media centers. While 63% of respondents reported their program operates on a flexible schedule where classroom teachers may schedule library use at the point of need, 4% reported that a flexible schedule is not a routine practice in their programs.
- Forty-one percent of instructional lessons delivered by Georgia media specialists contain a technology component, according to survey respondents.
- Training staff and students to locate, utilize, and evaluate technology resources is a critical component of Georgia media programs. Georgia school library media specialists are actively involved in expanding access to resources and modeling innovative teaching practices through training. Technology purchasing and installations often involve Georgia school library media specialists. Georgia school library media specialists are also involved in technology resources used throughout the school and community.

Conclusions and Recommendations

This report was designed to convey significant data regarding the state of Georgia's K-12 school library media programs, particularly in terms of demographics and high needs, collaboration and administration of media center programs, staffing and scheduling, serving special populations, and technology resources.

Recommendation #1

Georgia's media center programs are staffed with highly qualified and experienced school library media specialists. Credentialed school library media specialists are necessary to provide quality instruction, to develop policies and procedures, to train and coordinate staff and scheduling, to manage collections and resources, and to otherwise administer the programs. Research has indicated that having professionally trained, full-time certified library media staff administering the program positively impacts student achievement. **All Georgia schools, regardless of enrollment, require at least one full-time credentialed school library media specialist.** According to survey respondents, 90% of Georgia schools are currently staffed with at least one full-time credentialed school library media specialist.

Recommendation #2

Collaboration, as described in *Information Power*, is key to building partnerships for learning. According to respondents, school library media specialists across the state do not work in isolation. The majority of the local school media committees help set program goals. 21% have regularly scheduled meetings, 28% help set media program goals, 26% help make purchasing decisions, 7% help find additional funding, and 27% review challenged materials. 1% have no media committee. Across the state, school library media specialists are collaborating with teachers, other school library media specialists, public librarians, parents and community members, and students and volunteers. 36% reported that they collaborate with teachers on lessons to be taught in the media center. 23% collaborate on lessons to be taught outside of the media center.

All Georgia teachers and administrators should be educated on the benefits of collaboration with a credentialed school library media specialist.

Recommendation #3

The media center budget is a concern statewide. The largest group statewide, or 15%, reports that their annual budget falls within the $5000-1000 range. 2% have less than $1000 annually, 8% have budgets of from $1000-4000, 9% have budgets from $10000-19000, 2% have budgets of $20000-29000, and 1% have budgets greater than $30000. Nationally, the average annual budget for all school levels was $9367.83, according to the recent report in *School Library Journal* "Technology and the Roles of the School Library Media Specialist" (Brewer & Milam, 2005) survey. By comparison, Miller and Shontz (Miller & Shontz, 2003) reported in *School Library Journal* that the average national budget was $15,707.00 for the 2001-2002 school year.

Statewide, school library media specialists actively seek additional funding from many sources. 26% of media specialists statewide report that they secure additional funds from book fairs. 15% ear extra funds from the PTA, 11% secure additional funds from their county, 5% secure outside funding from the state, 6% secure outside funding from federal programs, 11% obtain funding from grants and foundations, 6% locate community sources of additional funding. *Only 3% of respondents reported that they do not obtain additional funding for their programs.*

Georgia media specialists are spending up to one-fourth of their budgets on technology or non-print resources. 17% reported that they spend between 10 and 25% of their budget on technology resources, while 9% reported that they spend between 25 and 50% of their budgets on technology resources, 2% reported that they spend between 51 and 75% of their funds on technology resources, and .2% spend between 76 and 100% of their funds on technology resources. 10% reported that they spend less than 10% of their budgets on technology resources. **Georgia school library media centers should be adequately funded to provide for sufficient numbers of current technology resources and print materials.**

Recommendation #4

Flexible scheduling is apparently still not all-encompassing in Georgia media centers. While 63% of respondents reported their program operates on a flexible schedule where classroom teachers may schedule library use at the point of need, 4% reported that a flexible schedule is not a routine practice in their programs; the remaining 27% of respondents did not answer the question. Additional survey responses indicated that 7% of respondents are on the schedule rotation where the media center is used to relieve teachers as a part of the regular school day and 13% of responses indicated that their media center operates on a fixed schedule where the majority of classes come to the media center at a certain day/time on a regular basis. Moreover, 28% responded that they are required to close the media center for activities unrelated to the media center program. Typical reasons for such closings include testing (30%), performing arts programs (19%), school functions (18%), teacher trainings (16%), PTA and/or community meetings (6%) and other reasons (9%). Twenty-nine percent of respondents reported that such closings happen rarely, but 14% reported that such closings happen occasionally and 2% reported that they happen frequently. Only 22% of respondents report that such closings never happen in their programs. A small percentage of Georgia media specialists (3%) report that their role includes teaching a regularly scheduled class with a curriculum that is not a part of the media program and a small percentage (1%) are required to cover a study hall or offer general student supervision. **All Georgia school library media centers should operate on a flexible schedule as defined in** *Information Power*: "To meet learning needs, the program's resources and services must be available so that information problems can be resolved when they arise. Predetermined timetables without other options and practices that limit access to resources on the basis of age, ability level, or other means of grouping can stifle intellectual curiosity and authentic learning."

Recommendation #5

When asked how the media center program impacts the achievement of special populations in the school, Georgia media specialists were positive. One media specialist from a Title 1 suburban elementary school in Camden County responded: "Our impact is most highly seen in all of our students being included in all the activities of the media program in a way that ensures their success. All students are included in our enrichment and life-long learning activities. Many students have had their learning enriched by being given access to technology and the training to use it so they can learn on their own. On a scale of 1 to 10 with 10 being High Impact I would give us a 6 on impacting special populations." A media specialist from a suburban elementary school in Chatham County concurred. "The media program ensures that all students have the opportunity to participate in the various programs. The reading components of the media program impact the English Language Learners to an extremely high degree." A media specialist from a suburban high school in Columbia County reported: "We have high interest/low vocabulary books for students with lower reading levels. We assist our visually-impaired student with research. We make our media center accessible to students in wheelchairs, always making sure there are no obstacles in the media center...I have purchased a set of encyclopedias designed for special needs students. I hope we have a positive impact on their achievement but plan to do more in the future with these students." Respondents to the survey indicated that approximately one-third of our programs are meeting the needs of special groups of students. While all patrons should be adequately served with resources and services, special needs student deserve equal treatments. **Staff development programs should be offered to Georgia media specialists in ways to better serve the needs of special populations of Georgia students.**

Toward an Integrated Model:

Information Literacy & Self-Regulation

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Abstract

Two fields of inquiry are examined in an effort to explicate the relationship between information literacy and self-regulation. A theoretical connection between these two areas of study is provided. Operational behaviors such as the ability to select and use appropriate procedures during the learning process, asking for help when at an impasse during the information search process, selecting and evaluating selected strategies for specific goals, information needs and personal success, and the ability to adapt personal domain knowledge in light of newly acquired information are presented as evidence linking these two fields of research. Implications of the interconnectedness between these two fields include increased understanding of the role information skills plays in the development of lifelong self-regulatory learning skills, increased inclusion of information literacy skills in the pre-service education curriculum, and continued development of information literacy skills within discipline specific curricula.

Introduction

Information literacy is the ability to access, use and evaluate information in an effective and efficient manner (American Association of School Librarians and Association for Educational communications and Technology 1998; California Media and Library Educators Association 1994; Eisenberg and Berkowitz 1988). Information literate students are students who recognize that information is needed to solve problems, can frame information needs in the form of questions or decisions, and can acquire quality information from a variety of sources, depending upon the specific information need.

Self-regulated learning is learning that students themselves control (Zimmerman 1995). They determine goals and strategies to reach goals. Students manage motivation, actions, and results in order to achieve desired results. Self-regulated students are students who purposively select learning goals (Carver and Scheier 2000). They are aware of help options, and appropriate times to access help, whether in the form of books, people, or other formats. Self-regulated students are motivated, self-aware, and believe in their own control over success or failure in a particular situation (Pintrich 1995; Zimmerman 1994).

Researchers who study self-regulation acknowledge the diversity of this field (Boekaerts, Pintrich, and Zeidner 2000). Major lines of inquiry include investigations surrounding the psychological constructs of self-regulation (Demetriou and Raftopoulos 1999; Zimmerman 1995, 2002), domain-specific paradigms within self-regulation (Boekaerts and Niemivirta 2000; Alexander 1995; Vancouver 2000), and investigations into the measurement and systematic definition of self-regulation (Winne and Perry 2000). The interest in domain-specific characteristics of self-regulatory behavior, however, does not encompass the area of information literacy, a key construct of the school library media field.

This article will provide a theoretical and operational link between the fields of information literacy and self-regulation by examining the underlying theoretical constructs, the component cognitive and behavioral skills, as well as the operationalized behaviors that are discussed in the body of literature. As information becomes more readily available to students in a variety of formats it is important for educational researchers and librarians to understand the behaviors and contributing factors that affect student success in various learning environments. Having a theory-based understanding of the relationship between self-regulation and information literacy may provide researchers and practitioners in both areas a common understanding so that innovations within libraries (both academic and research) and classroom settings can be developed.

Theoretical Constructs

In order to begin integrating information literacy and self-regulation, a review of the theoretical constructs comprising each field is warranted. This review is not intended to be exhaustive. Rather, it is intended to provide the reader with a basis of understanding for the

supporting theories within each field, accompanying definitions, and a framework from which the integration process can be viewed.

Information Literacy

Information literacy defined. Information literacy is becoming ubiquitous within the library community. Most educators, however, have an innate understanding of *literacy* but when combined with *information* that understanding becomes clouded. Several definitions for information literacy have been developed by reputable agencies and researchers since the early 1990s (Abilock 2004, 2004; American Association of School Librarians and Association for Educational communications and Technology 1998; Association 2004; Eisenberg, Lowe, and Spitzer 2004; Snavely and Cooper 1997). Common themes found in these definitions include the ability to recognize that information should be used to solve problems; the importance of basic information retrieval skills, the ability to be critical in the information use process, and the ability to use information across contexts or subject areas. One unique definition specifically addresses the transformation that should occur in learners in order for information literacy to be considered an internalized characteristic. "Information literacy is a transformational process in which the learner needs to find, understand, evaluate, and use information in various forms to create for personal, social, or global purposes" (Abilock 2004 10).

Information literacy models. As with other fields of research, experts in the field of information literacy have developed several models in order to more clearly communicate the complexity of this concept to practitioners. Three of the most well-known models are The Big Six Information Skills (Eisenberg and Berkowitz 1988), Information Search Process (Kuhlthau 1993), and Pathways to Knowledge (Pappas and Tepe 2002). Each of these models provides a unique way of examining information literacy.

The Big Six Information Skills is a skills-based model describing overarching, necessary tasks that students should master in order to be considered information literate. It is neither task nor subject-specific and is based on the precept that students need to plan for information needs, execute the information search process, create a product or solution, and then evaluate the results that result from this effort. This model is intended for use by students, teachers, and library media specialists in the PK-12 arena; however it can also be implemented with students in college or university settings.

(Kuhlthau 1993) describes information literacy in a more task-specific manner than do Eisenberg and Berkowitz(1988). Her model describes the process that student-researchers engage while completing information search tasks. The Information Search Process illustrates information literacy through three different aspects of personal performance; thoughts that occur while researching, feelings that arise as a result of the search process and typical actions that can be found at various stages of the search process. Kuhlthau (1993) identifies seven different stages of the information search process, each of which has corresponding differences in the feelings, thoughts, and actions that are experienced by searchers. Searchers' feelings progress from uncertainty at the beginning of the search process, to a final feeling of either satisfaction or dissatisfaction. Searchers' thoughts also proceed along a continuum, from ambiguity, at the point just after the search process begins, to specificity, as it nears the end. At the same time, the actions that searchers exhibit progress from a focus on things that are relevant (having anything to do with the topic) to those that are pertinent (specific support of the topic) to the topic under investigation.

Both Eisenberg and Berkowitz (1988) and Kuhlthau (1993) illustrate information literacy in models that rely on the structure of text on paper in a two-dimensional manner. Pappas and Tepe (2002) however, use two dimensions to illustrate the three dimensional information search process rather than a more linear one. Pathways to Knowledge (Pappas and Tepe 2002) employs the use of curvilinear bands to illustrate the relationship between skills associated with information literacy, while also providing for the need to create products based on information gathered during the search process. Pappas and Tepe (2002) purposefully intended to illustrate the information search model in this manner:

> "Professional information specialists (e.g., librarians) often pursue different pathways to finding and using information. ... It seems appropriate to teach

students that a nonlinear approach is not only accepted but is the norm. A serious effort was made to design the Pathways model so that the nonlinear nature of the process would be evident in the graphic version" (Pappas and Tepe 2002 1)

Information literate students. Information literacy in students has been described in terms of specific and related skills that learners should possess in order to function in an information literate manner. Information literate students tend to posses skills that fall into three broad categories; those relating to accessing specific information, those relating to the use of information and those relating to the evaluation of information (American Association of School Librarians and Association for Educational communications and Technology 1998).

Generally, information literacy skills are associated with three main areas: the ability to access, evaluate, and use information efficiently and effectively. Specific skills are grouped within these three main areas. Table 1 illustrates these skills. Each of the skills can be further subdivided into component parts. It is not uncommon to find these component parts and skills woven into national subject-area standards, courses of study, and other curriculum documents (American Association of School Librarians and Association for Educational communications and Technology 1998; Association 2004). The relationship between subject-area standards is illustrated in Figure 1.

Table 1. Information literacy skills

Accesses Information	Evaluates Information	Uses Information
Recognizes the need for information	Establishes authority	Organizes information for practical application
Recognizes that accurate and complete information is the basis for intelligent decision making	Determines accuracy and relevance	Integrates new information into an existing body of knowledge
Formulates questions based on information needs	Recognizes point of view and fact/opinion knowledge	Applies information in critical thinking and problem solving
Identifies potential sources of information	Rejects inaccurate & misleading information	
Develops successful search strategies	Creates new information to replace inaccurate or missing information as needed	
Accesses print and technology sources of information		
Is a competent reader		

Figure 1. Selected Information Literacy Skills Within Curriculum Standards

Information Literacy Standard	Curriculum Connections
… Accesses information efficiently and effectively (Recognize that information is the basis of decision-making, formulate questions, identify sources of information, access print & technology sources of information, etc.)	English: • Students conduct research on issues and interests by generating ideas and questions, and by posing problems… • Students use a variety of…information resources to gather an synthesize information and to create and communicate knowledge Social Studies: • Students locate, access, analyze, organize and apply information about selected public issues … Math: • Students pose questions and collect, organize, and represent data to answer those questions Science: • Students identify questions and concepts that guide scientific investigations • Understand that scientists conduct investigations for a wide variety of reasons Technology: • Students use technology locate, evaluate, and collect information from a variety of sources • Students evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks • Students use technology resources for solving problems and making informed decisions
… Evaluates information critically and competently (Establishes authority, determines accuracy and relevance, rejects inaccurate & misleading information, crates new information to replace inaccurate or missing information, etc.)	English: • Students apply a wide range of strategies to comprehend interpret, evaluate, and appreciate texts… Social Studies: • Students locate, access, analyze, organize and apply information about selected public issues … • Students recognize and interpret varied perspectives about human societies & the physical world using scientific knowledge, ethical standards, and technologies from diverse world cultures Math: • Students monitor and reflect on their mathematical thinking in solving problems • Students apply a wide variety of strategies to solve problems and adapt the strategies to new situations Science: • Students formulate and revise scientific explanations and models using logic and evidence Technology: • Students use technology locate, evaluate, and collect information from a variety of sources • Students evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks

Information Literacy Standard	Curriculum Connections
... Uses information accurately and creatively (Applies information in critical thinking and problem solving, Organizes information for practical application, Integrates new information into an existing body of knowledge)	English: • Students conduct research on issues and interests... they gather, evaluate and synthesize data from a variety of sources to communicate their discoveries in ways that suit their purpose and audience. • Students use a variety of...information resources to gather an synthesize information and to create and communicate knowledge • Students read a wide range of print and non print texts ... to acquire new information... Social Studies: • Students explain and apply ideas and modes of inquiry drawn from behavioral science and social theory in the examination of persistent issues and social problems • Students formulate strategies and develop policies for influencing public discussions associated with technology-society issues... Math: • Students pose questions and collect, organize, and represent data to answer those questions • Students apply a wide variety of strategies to solve problems and adapt the strategies to new situations Science: • Students design and conduct a scientific investigation • Students use technology and mathematics to improve investigations and communications. • Students communicate and defend a scientific argument Technology: • Students use technology for solving problems and making informed decisions • Students employ technology in the development of strategies for solving problems in the real world

National Standards information from:

English: National Council of Teachers of English (2004). *Standards for the English language arts*. Retrieved June 25, 2004 from: http://www.ncte.org/about/over/standards/110846.htm

Social Studies: International Society for Technology Education (2004). *Curriculum and content area standards*. Retrieved June 25, 2004 from: http://cnets.iste.org/currstands/index.html

Science: National Science Teachers Association (1996). *National science education standards : Observe, interact, change, learn*. Washington, D.C.: National Academies Press. Retrieved June 25, 2004 from: http://www.netlibrary.com

Math: National Council of Teachers of Mathematics (2004). *Principles and standards for school mathematics*. Retrieved June 25, 2004 from: http://standards.nctm.org/document/chapter3/index.htm

Technology: International Society for Technology Education (2004). *National educational technology standards for students*. Retrieved June 25, 2004 from: http://cnets.iste.org/students/

The ability to access information, to be able to find what is wanted or needed, is the cornerstone of information literacy. Without the ability to find information, no other aspect of using or evaluating that information or the products that are produced from it is possible. Skills associated with accessing information include developing appropriate research questions, developing appropriate search strategies to find needed information, locating specific information with a source, and modifying search strategies to account for initial success or failure in the information search process (American Association of School Librarians and Association for Educational communications and Technology 1998; Eisenberg and Berkowitz 1988; Pappas and Tepe 2002).

Once information has been accessed, that is once it has been located it can be used by the searcher. Information can be used to create products such as term papers or presentations, or it can be used to make decisions such as which college to attend or which car to purchase (Eisenberg and Berkowitz 1988). Pappas and Tepe (2002) define information use as a part of the Interpretation and Communication phases of their model. In these phases the student internalizes new information and creates a new product in order to demonstrate understanding of a particular topic or question; while Kuhlthau (2004) incorporates information use skills throughout her ISP model, albeit in varying levels of relevance from the searcher's point of view. For instance, a student may start out accessing information that is relevant or "has to do with" a certain broad topic, and then would progress to the point of accessing specific information that is pertinent, that is applicable to a narrower topic at hand.

The final descriptor of an information literate student is one who is able to evaluate information in a critical and competent manner (American Association of School Librarians and Association for Educational communications and Technology 1998). Skills such as the ability to recognize point of view, bias, relevancy, accuracy, authority within an information source all comprise the ability to evaluate information (American Association of School Librarians and Association for Educational communications and Technology 1998; Eisenberg and Berkowitz 1988; Pappas and Tepe 2002). Also considered to be part of evaluation is the ability to determine which source is the better source of information when presented with two or more potential places to search for appropriate information in relation to a problem or task at hand. In addition to understanding the skills that comprise information literacy, an examination of the behaviors associated with information literate behavior is warranted.

Information literacy behaviors and dispositions. Certain behaviors and dispositions are associated with information literacy. For purposes of this discussion, skills are characteristics that can not be directly observed unless they are being demonstrated by a student. Behaviors are the actions that demonstrate skills. For instance, an information literate student is one who has the skill of locating pertinent information within an information source. This skill can be demonstrated through the behavior of note-taking, highlighting, or other similar activity. Dispositions are attitudes or temperaments that would support the implementation of information literacy skills in a personally meaningful manner.

The behaviors associated with information literacy skills have been the focus of numerous studies examining the nature of interaction between learners and information sources, problems, and products (Marchionini 1989). Activities such as constructing and implementing online searches (Hill and Hannafin 1997; Marchionini et al. 1993), and writing research reports (McGregor 1993; Stripling and Pitts 1988) have been studied, as well as general studies that examine information searching behaviors in an attempt to fully understand its complexities (Eisenberg and Berkowitz 1988; Kuhlthau 1993; Marchionini 1989).

Dispositions related to information literacy are more complex to identify and define than behaviors or skills. These are the attitudes that set information literate people apart from the bulk of the learners or information searchers. Some researchers address dispositions within the evaluation portion of information literacy (American Association of School Librarians and Association for Educational communications and Technology 1998; Eisenberg and Berkowitz 1988). In this manner, learners posses an attitude of striving for excellence, choosing to evaluate their own process in addition to the product of an information problem solution. Additionally, the national information literacy standards address dispositions within the standards for "independent

learner" and "socially responsible." Only the first set of standards addresses specific skills, the remaining standards utilize those skills in an applied manner.

Self-Regulation

Overview and definitions. At the most general level, self-regulation can be defined as regulating the cognitive processes within oneself. Specifically, self-regulated learning has been described as a three-pronged approach to control of personal behavior, motivation and affect, and cognition (Pintrich 1995); active participation in the cognitive, motivational, and behavioral aspects of personal learning (Winne 1995; Zimmerman 2001); and a "systematic process of human behavior that involves setting personal goals and steering behavior toward the achievement of established goals" (Zeidner, Boekaerts, and Pintrich 2000 751) Common to each of these definitions is the idea of volition. That is, the student or learner referred to in each definition has a purpose or specific goal that guides behavior and cognition during the learning process.

Unlike specific content areas and information literacy, self-regulation skills are not explicitly stated in the form of a standards document. Rather, students are expected to exhibit a variety of self-regulatory behaviors during their tenure in school settings. These include the ability to manage learning time (Schunk and Zimmerman 1994), to employ specific study strategies (Winne and Hadwin 1998), and to request help when appropriate (Hacker, Dunlosky, and Graesser 1998). Students must also possess a certain degree of metacognitive awareness that allows them to understand their personal characteristics in relation to the school-related tasks at hand. Learners can exhibit these abilities as characteristic behaviors or dispositions.

Characteristics of self-regulated learners. Zimmerman (2001) presents learning as self-regulated when "the learner displays personal initiative, perseverance, and adaptive skill in pursuing it" (p. 1). In other words, when a student is the driving force behind the learning, keeps trying in difficult situations, and changes learning tactics in order to be more efficient or effective, that student is exhibiting self-regulated behaviors. This view of self-regulated learning rests primarily on the motivation and adaptive skills of the learner. Winne (1995) provides insight into the behaviors that are frequently observed in self-regulated students. These include the ability to routinize subject-specific processes and tasks; exhibiting self-starting behavior, and an ability to accurately predict performance results prior to receiving feedback from a teacher. Additionally, self-regulated learners are reported as being highly aware of internal monitoring and control by being self-motivated and reliant on a routine method of learning (Zimmerman 1994). Specifically, self-regulated learners are better at planning a strategy for achieving an educational goal, implementing that strategy, monitoring its success and distributing consequences to themselves than non self-regulated learners (Zimmerman 1994).

Two important dispositions relating to self-regulation are volition and effort (Winne 1995; Zimmerman 2000). A self-regulated student utilizes skills and strategies with volition, that is they do something on purpose and with a specific purpose in mind. Likewise, they also persist at a task or problem until it is finished. This may entail the application of several strategies or skills, especially if the first choice is not successful.

Initiating Convergence of Information Literacy and Self Regulation

It is reasonable to assume that practitioners and researchers in each of the fields presented here might need a rationale for the convergence of these two heretofore unlinked fields. The nature of field specificity in research circles is such that many times related information is not sought after by anyone outside a particular field. Also, researchers tend to focus on questions that have immediate impact in their own fields. When discussing this phenomenon within the field of self-regulation, (Boekaerts and Niemivirta 2000) offer, "A consequence of such domain or area specificity is that the information assembled about self-regulation is published in separate journals. ... a kaleidoscope of terms and labels exists and [these] may sound unfamiliar, even alien, to researchers who are not in that particular area" (p. 2). If this alien terminology exists within single domain, it is not unreasonable to see this effect across domains. The discussion that follows includes brief examinations of contextual presentations of each field, followed by a

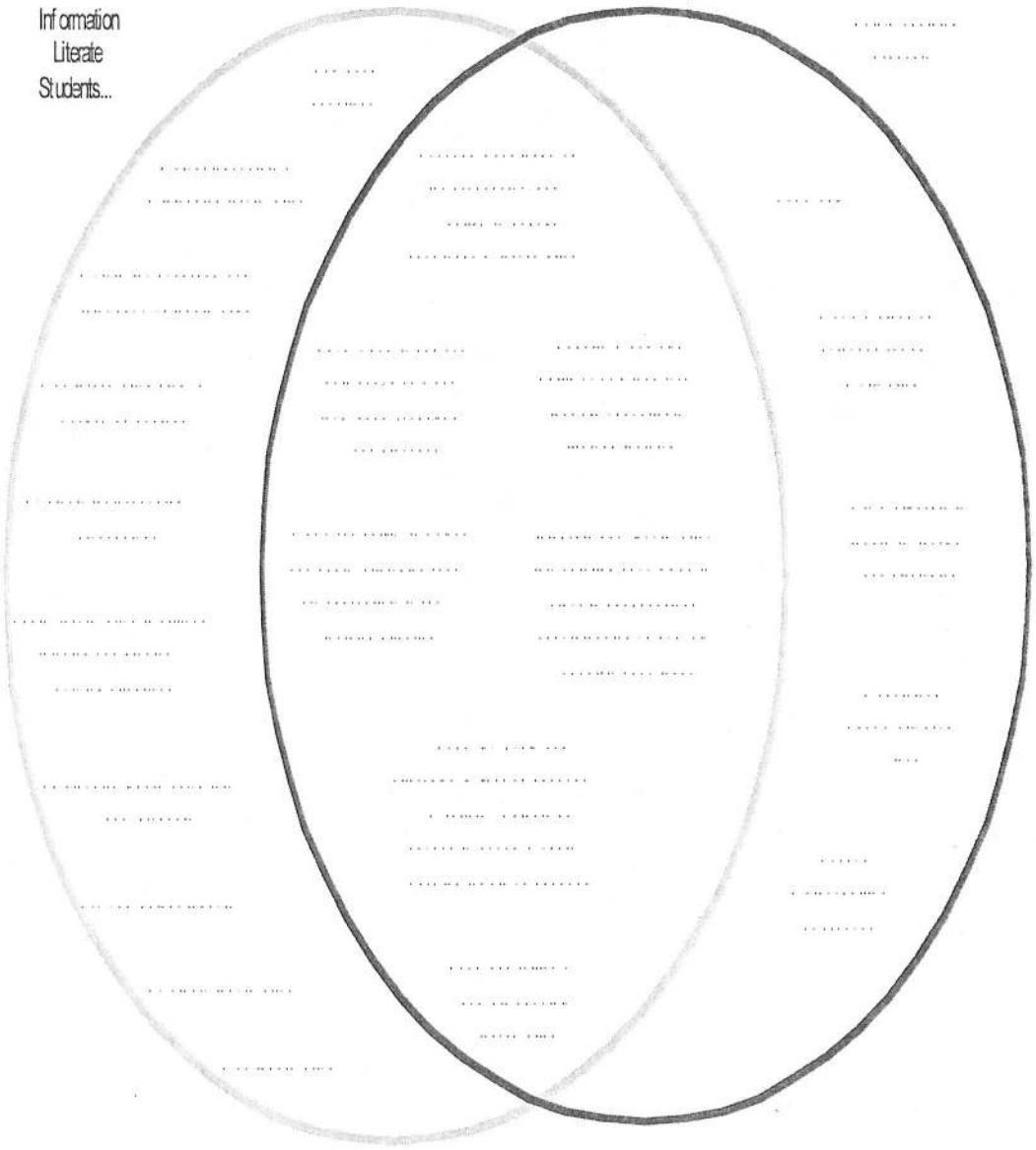
discussion that explains the commonalities between the two fields. Finally, instructional implications are provided for educators in both the K-12 and university arenas.

Information literacy in context. As discussed previously, information literacy skills can be found within the standards of specific content areas. These skills are also found within the greater school context. Tasks as mundane as completing individual homework assignments and as complex as designing, implementing and communicating about a semester-long research project require students to successfully implement a variety of information literacy skills (Eisenberg and Berkowitz 1988).

Self-regulation in context. Self-regulation researchers have identified certain tasks that may also be supported by strong information literacy skills. Open ended tasks that are project-based, research-based, and require interpretation increase opportunities for students to increase motivation and engagement in specific subject areas. Consequently, this will affect attributions of success to effort rather than ability (Paris, Byrnes, and Paris 2001) Additionally, students expectations of themselves change with the requirements placed on them by teachers and various task settings. Paris, Byrnes, and Paris (2001) contend that differences in school expectations regarding assessment and evaluation can affect student expectations of self-ability, perceptions of task value, and relative importance of competition. However, students have difficulty with complex tasks requiring self-regulatory manner. One possible reason might be that students have difficulty making relationships between classroom tasks and the big picture in many subject areas. They fixate on the micro-level task, rather than on the macro-level concept (Paris, Byrnes, and Paris 2001).

Distinctive characteristics of self-regulation and information literacy. The convergence between self-regulation and information literacy can be though of as the description of the characteristics that populate the center section of a two item Venn diagram (See Figure 2).

Figure 2. Convergence of self-regulation and information literacy



The main difference between the two fields rests in the specificity of information literacy and the attention to metacognition and motivation in self-regulation. Arguably, while an information literate student can also possess metacognitive skills and awareness as well as being motivated in a general sense; the self-regulated student possesses these characteristics in a specific subject area, or for a specific task. Also, the goal setting in self-regulation could relate to a variety of tasks such as the management of mental health issues and chronic illnesses (Boekaerts and Niemivirta 2000), not all of which pertain to school-tasks. The goal setting within information

literacy is generally accepted as being related to an information problem or task (Abilock 2004; Doyle 1992; Eisenberg, Lowe, and Spitzer 2004).

Convergence of Self-Regulation and Information Literacy. The commonalities between the two fields revolve around the application of regulatory tasks and procedures relative to particular task. Self-regulated learners monitor (Winne 1995, 2001) while information literate learners evaluate (Eisenberg and Berkowitz 1988). Even though different terms are used, the process of examining a result or progress along a continuum and then adjusting actions based on that evaluation is described by both theories. Both fields recognize the developmental nature of acquiring information literacy and self-regulatory skills (Kuhlthau 2004) as well as the importance of finding information in appropriate sources in the form of reliance on scaffolding (Manning and Glasner 1996) or of help from human resources (Eisenberg and Berkowitz 1988; Kuhlthau 2004).

Instructional Implications

There are several implications of the convergence of these two fields of study. First, it is important to recognize that the development of self-regulatory skills and dispositions as well as the acquisition of information literacy skills is a developmental process that may not complete until well into adulthood (Kuhlthau 2004; Pressley 1995). As such educators striving to develop these skills in students may want to consider adopting an integrated approach to them. This approach would combine overt instructional practices along with ample opportunity for situational practice of the skills in a global manner. This integrated approach has been advocated within the library media community for a number of years (American Association of School Librarians and Association for Educational communications and Technology 1998) and is also recognized as valuable within the field of self regulation:

"Do not have students learn and practice one new procedures at a time, but rather have them learn and practice several simultaneously, interspersing practice of each. Although such interspersal of practice may slow speed of acquisition of new procedures, durable knowledge and use of the new procedures may be increased." (Pressley 1995 211)

Secondly, educators and library media personnel may want to consider borrowing instructional models from both fields when making decisions about developing teaching environments for students at all developmental stages. Both Winne and Hadwin (1998) and Eisenberg and Berkowitz (1988) use nearly identical terminology when describing the stages of self-regulation development and information literacy. Both models describe processes in terms of defining a specific task, planning and implementing a strategy for completion and evaluation of the process or product in order to make decisions regarding adaptations that may or may not be required.

Finally, in order to better understand the learning and instructional needs of students in a particular learning environment, it may prove useful to create and implement assessments or inventories that can measure the self-regulatory or information literacy developmental stage of students. Researchers have been using a variety of methods to measure aspects of self-regulation for a number of years (Manning and Glasner 1996; Schunk and Zimmerman 1994; Winne 1995). These inventories might be used as the basis for information literacy inventories that can be administered by library media specialists and teachers in order to inform the teaching practices of both parties. Additionally, these inventories can be used as an additional measure of program effectiveness, especially when results are considered over time.

Paris, Byrnes, and Paris (2001) provide support for the need to have structured development of self-regulation in students in order for student to be able to be well assimilated into their culture.

"Participation [in a culture] is a key process in the enculturation into membership. One of the fundamental differences between successful and unsuccessful students is their access to effective learning practices because unequal access leads to

different patterns of appropriation and use... We emphasize the act of becoming a self-regulated person as part of the development of the individual in a group" (p. 256)
Additionally, the SCANS ((SCANS) 1991) report and the American Library Association (1989) both advocate for the development of information skills so that students will be able to be productive members of an information-rich society. This position is best voiced from the American Library Association:

"Ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how knowledge is organized, how to find information, and how to use information in such a way that others can learn from them. They are people prepared for lifelong learning, because they can always find the information needed for any task or decision at hand (p. 1).

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Teacher Training for Diversified Instruction and Assessment: Overview of a Program for Elementary School 4th Grade Classrooms

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What's the idea behind this program?

Suppose it were the case that many children had the ability to achieve at higher levels in school, but were failing to do so for a reason that could easily be corrected?

This program rests on the notion that this supposition is, in fact, true. Its aim was to implement three different methods of instruction and assessment at the 4th grade level. Because we believe that a change in students' learning must start with changes in teaching, we focused our efforts on working with teachers. Our goal was to show that implementing any one of three kinds of teaching in 3 subject-matter areas (language-arts, mathematics, science) would result in improved teaching and student outcomes. The three kinds of teaching that we compared were:

- *Enhanced comprehension and memory instruction*
- *Critical thinking instruction*
- *Analytical, creative, and practical thinking instruction*

How do the three instructional methods differ?

All three instructional conditions covered the same basic skills (e.g., using pronouns at appropriate levels in writing, or fractions at appropriate levels in mathematics). Where the conditions differed was in the methods teachers were given for teaching these skills:

- *Mnemonic-theory based instruction*

Some students fail to learn adequately because they do not adequately comprehend the material they are supposed to be learning or because they do not remember it. This condition emphasized comprehension and memory skills. It consisted of regular instruction with enhanced coverage of mnemonic techniques and learning aids based on recent cognitive research on working memory. Students learned how to understand, encode, store, and retrieve information effectively. These skills are essential to high performance on standardized tests.

- *Critical-thinking instruction*

Some students fail to learn adequately because they are unable to reason and think adequately. They can recall material, but they cannot use it. The result is that when they are tested on the material, they often fail to show what they know because they do not know when and how to use the material. On standardized tests, their scores may be disappointing because they cannot answer questions even on material they know about but cannot use. Students in this condition learned how to analyze, evaluate, compare and contrast, judge, critique, and explain material.

- *Analytical, creative, and practical instruction*

Not all students are primarily "memory" learners. Some students learn in different ways. For example, some may learn best when given an opportunity to think analytically, whereas others may learn best when given an opportunity to learn creatively and/or practically. These students may have excellent learning skills, but not be able to apply them in many classroom settings because their preferred mode of learning does not match the conventional mode of teaching. Students in this condition learned to process material in three ways. The first is analytical or critical (as described above). The second is creative: Students were taught to create, invent, discover, explore, and suppose. The third is practical: Students were brought to apply, use, utilize, and implement what they know.

Who participated?

Overall, 196 teachers and 7702 students participated in the study. They spanned four years, 9 states, 14 school districts, and 110 schools. The geographical and socio-economic status of participating districts was diversified, and, although the sample included primarily classrooms of fourth-graders, there were also some third- and fifth- graders who were taught by teachers

participating in the study with their fourth-graders. A total of 33,525 tests, consisting of 1,231,243 items, were coded and analyzed to evaluate the impact of the three instructional approaches. Due to the large number of data points, data analysis is still being finalized.

What are the preliminary findings?

Hierarchical linear modeling was used to compare the gain from pre-test to post-test across the three instructional conditions for each unit. A three-level model was used to predict post-test scores, with the first level corresponding to individual growth from time one (pre-test) to time two (post-test), the second level corresponding to students, and the third level corresponding to teachers. Experimental condition was modeled at the teacher level. Estimated gain for an individual was considered to be the value of the slope when predicting the post-test from the pre-test.

First, all three instructional modes resulted in substantial gain from pre-test to post-test. Furthermore, the results indicate that the analytical/.practical/creative students overall tended to have consistently higher gain scores than students in the control conditions. Final analyses will be completed during the academic year 2005/2006.

For further information, please visit our website at www.yale.edu/pace

Ed. Note: One of the three methods used was the Big6 by Eisenberg and Berkowitz.

TEKSLink: The Texas Effort to Link the Library with the Classroom

Walter Betts and Karen Shull

Introduction

Standards-based accountability for student achievement brings a challenge to librarians in two ways. The first challenge is to contribute through direct instruction of students. The librarian does not teach content, but uses content as a platform for teaching information literacy skills. Depending on how the assessment is structured, these skills can be critical to student achievement. In Texas, critical thinking skills are tested throughout all content areas, requiring students to be able to make inferences from text, charts and maps, and photographs, and express themselves clearly when writing from a prompt. All of these skills are honed through strong information literacy programs.

The second challenge is to have a collection that supports the curriculum. Collection development for school libraries has shifted from broad collections designed to meet student interests to collections focused on meeting the needs of the curriculum. This phenomenon is nationwide. In North Carolina, teachers charged with teaching the state curriculum quickly discovered that textbooks would not suffice, and decided that the schools' libraries would be needed to fill the gap. (Lowe, 2001)

How can one assess whether or not materials support the curriculum? The technique that analyzes the relationship between the materials in the library and the curriculum being taught in the classroom can be termed resource alignment or collection mapping – the methods are essentially the same. Collection mapping is an involved and time consuming process – time that campus librarians do not have. The real value offered by the process is offset by the likelihood that it will not be done.

The MARC 658 tag

Until the invention of the TEKSLink method, the only way to capture the curriculum/library materials correlation has been through the use of the 658 tag in the MARC record. Developed in Ohio in the early 1990's, the MARC 658 tag holds specific curriculum information about each item in the library: state standard alignment, correlation factor, grade level and academic area covered, and even local benchmark information. Early data from a trial in Ohio indicated that the 658 tag provided a wealth of valuable information to teachers and librarians (Murphy, 1995). In 1996, the tag was adopted by MARBI by a unanimous vote with no discussion.

So, why aren't 658 tags ubiquitous in MARC records?

Because in practice, the 658 tag doesn't work. An elementary school library collection can easily have over 12,000 items, and the librarian may purchase another 50 – 150 items per year. Putting in the 658 tag for the existing collection could take several years. Keeping up with newly purchased items seems more likely until workflow is considered. Many librarians "wash" records through a bibliographic utility such as Marc Magician before loading them into their system, and the 658 could be added at this point – record by record. The time required to analyze each item and determine curricular applicability could be staggering, especially in light of the librarian's primary duty: to teach information literacy. Given the choice of teaching and collaborating or adding content to MARC records, it is not surprising that the 658 tag is bypassed. What is surprising is that it is employed at all.

Proponents of the MARC 658 tag also overlook the fact that in districts with a union catalog, campus librarians can be excluded from the cataloging process. Often, a district cataloger has the responsibility for overseeing the integrity of the database. The cataloger loads and cleans the records, and will generally have little or no knowledge of curriculum correlations. In these instances, the 658 is crippled, as the system of getting books into libraries is not flexible enough for it to be employed. In both models –

campus loaded records and district loaded records – the weakness of the 658 tag comes back to the same element: the need to amend individual item records.

The TEKSLink method

TEKSLink uses a global correlation, based on sound classification principles. The principle behind TEKSLink is simple: the correlation between the curriculum and the materials is through subject headings in the automated catalog. Almost all records come with subject headings, and most cataloging workflows are designed to catch a lack of subject headings. Global categorization through subject headings is already in effect for both existing records and newly acquired materials. The TEKSLink method links the existing subject headings to state curriculum objectives by use of the "see" reference. Use of the "see" reference allows a user – teacher, librarian, principal, or even a parent – to use a state curriculum standard as a search term, and quickly determine what materials exist to support that standard.

The weakness in the TEKSLink method is in subject heading application. If materials do not have proper subject headings, then the material is invisible. However, most librarians who catalog materials are sensitive to a lack of subject headings, and have some workflow in place to deal with this contingency. Addressing this concern out of concern for normal patron access also corrects the weakness of TEKSLink.

Obviously, the TEKSLink method has profound implications for collection development. When TEKSLink has been implemented, a search on a curriculum standard quickly reveals the amount of materials available, and these items can be checked for condition and age. (See 1.1 and 1.2) Librarians should be able to quickly gauge whether or not they have sufficient materials, or outdated materials, for any curriculum standard. In addition, classroom teachers and administrators will be better able to assess the quantity and quality of the materials for each curriculum standard, and participate more fully in the decision-making process in acquiring library materials.

TEKSLink history

TEKSLink started with conversations between the founders, Walter Betts (Systems Librarian, Dallas Independent School District) and Karen Shull (Director of Library Media Services, Richardson Independent School District). Both Mr. Betts and Ms. Shull were members of the Cataloging Focus Group of the Texas Library Connection's union catalog. One of the charges to the Focus Group was to correlate library materials with the state curriculum standards. Discussion inevitably revolved around the MARC 658 tag, but ideas for actual implementation were few and committee members were reluctant to engage a task so monumental. In the summer of 2002, Mr. Betts and Ms. Shull concluded that the key to any successful strategy was in getting beyond individual item records. The key was to use subject headings. Amending the authority record of a subject heading to include a "see" reference of a state curriculum standard would allow a user to search by a curriculum standard, and tie the standard to a relevant subject heading. Both Mr. Betts and Ms. Shull were certain that the authority record would provide the link they needed for a global application of state curriculum standards.

Convinced of this direction, Mr. Betts created "see" references from the Texas Essential Knowledge and Skills (TEKS) second grade Science curriculum, which is primarily concerned with the water cycle. Using obvious subject headings, such as "rain", Mr. Betts amended the authority records to include the state standard. He then demonstrated this method to Ms. Shull.

It was quickly apparent that the method succeeded. Searching on the term "TEKS" in a campus online catalog brought up the standards. Clicking on a single standard revealed a list of materials, all of which were on that particular campus. Ms. Shull knew immediately that she and Mr. Betts had succeeded in linking materials with standards. Now they would need to figure out a way to validate which headings would be applied to which standards.

Both Mr. Betts and Ms. Shull were convinced that in order for the TEKSLink correlation to be valid, it needed to be made at the field level – classroom teachers and campus librarians, working in partnership. To see if the principle was workable, they recruited districts in the Dallas area to help with a trial process.

The elementary Science TEKS were broken into grade levels, and distributed to various districts. Each district then further broke apart the grade level TEKS, and found classroom teacher – librarian teams to generate concept words for the curriculum standards. District catalogers translated the concept words into approved subject headings, and sent them back to the campus teams for approval. Approved terms were sent to one district for authority file processing. The resulting authority file was made available to each participating district, and TEKSLink was born.

In December, 2002, Mr. Betts and Ms. Shull took their project to the bi-annual Cataloging Focus Group meeting. They showed the results through a search of a participating district's OPAC, and were pleased to see the excitement TEKSLink generated. Many other districts wanted to become part of the project, and Mr. Betts and Ms. Shull presented a model of how the next phase of the project could go forward.

In the summer of 2003, six districts teamed together to create TEKSLink headings and authorities in the area of elementary social studies: Abilene ISD, Aldine ISD, Fort Bend ISD, Houston ISD, Pasadena ISD, and Spring Branch ISD. All but Abilene were in the Houston area. The inclusion of Abilene ISD was test the effect of physical distance on the collaboration effort. Mr. Betts and Ms. Shull, in conjunction with project coordinator Nancy Goralski, concluded that email rendered all distance meaningless.

Currently, Round Rock ISD is coordinating the elementary language arts TEKSLink project, and Mesquite ISD is coordinating the elementary math TEKSLink project. Secondary social studies and science are looking for project coordinators, and there is already a list of volunteer librarians for each project.

The TEKSLink Project Methodology

The TEKSLink Project starts with the matrix of TEKS for a particular content area, such as elementary science. The matrix lines up the skill progression and ensures that all grade levels in the skill have their TEKS listed. The matrix is created by either Mr. Betts or Ms. Shull, and is given to the Project Coordinator.
The second step is the selection of a Project Coordinator for the TEKS content area. The Project Coordinator will either be a professional cataloger, or have unrestricted access to a professional cataloger.

The Project Coordinator will also assign sections of the TEKS to the participating districts, schools, or individual librarians. Districts and schools will further break down their assigned section and distribute it to teacher – librarian teams. Individual librarians will find a classroom teacher as a partner.

The individual TEKS given to the teacher-librarian teams are used to generate concept words, natural language expressions which will be translated into controlled language by the cataloger. For example,

> §112.4. Science, Grade 2, (b) Knowledge and skills, (10) Science concepts. The student knows that the natural world includes rocks, soil, water, and gases of the atmosphere. The student is expected to: (A) describe and illustrate the water cycle; and (B) identify uses of natural resources.

Concept words generated by this standard included rain, evaporation, water, and clouds. Concept words are meant to be generated quickly, and usually the teacher - librarian teams are given no more than two or three standards to address. The concept word process usually takes no more than 45 minutes to an hour.

The concept words are then sent to the Project Coordinator to be translated into standardized subject headings. Because the school libraries in Texas were required to use Library of Congress subject headings when the Texas Library Connection was formed, TEKSLink uses only LC headings.

After the translation, the headings are returned to teacher – librarian team for verification. The teams check to see that the controlled language terms are acceptable, striking any that are not, then return the lists to the Project Coordinator. The Project Coordinator consults the matrix to ensure that the same terms are being applied when the skills are on a continuum, and then sends the standards and terms to the Project Directors. Creation of the actual authority file follows. When the file is completed, it is posted on the TEKSLink website for download into automation systems. Once the download is accomplished, the automation system patrons – teachers, librarians, students, and parents – have a powerful new tool for resource alignment.

Who owns TEKSLink?

TEKSLink is owned by the public school children of the State of Texas, and may be freely used by anyone. No one may charge for the use of TEKSLink correlations or the authority database. Several vendors are interested in adding TEKSLink correlations as a service to their Texas customers. Mr. Betts and Ms. Shull work with vendors – materials, bibliographic and automation – in order to explain the TEKSLink methodology and files, as well as clarify the ownership of the database.

Replicating TEKSLink

Mr. Betts and Ms. Shull feel that the TEKSLink methodology is easily replicated from state to state. Because the project is entirely pro bono, no funding is required for start-up, only the desire to correlate library materials with state curriculum standards. With enough dedicated professionals, only a few of which need to have special expertise, the task can be accomplished. Texas will have completed the core areas for both elementary and secondary by the summer of 2006, allowing our teachers and librarians to work together much more effectively, and demonstrating that the library is an essential partner in student achievement.

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1.1 TEKSLink Search Result in Online Catalog (Richardson ISD, Richardson, Texas. Library Automation system by Library.Solution)

Bowie Elementary School

HOME HELP SEARCH BROWSE COMBINATION HISTORY CHANGE LIMITS

You Searched: Subjects for words that begin with teks
1 to 10 of 238 items.

Results filtered according to Limits.

Select an option to save result

Sort Search Results By: Alphabetical

1. TEKS 112.A.2.b.10.A -- Observe and describe properties of rocks, soil, and water. Subject
   SEE Rocks **Matches 5 items**
   SEE Soils **Matches 5 items**
   SEE Water **Matches 13 items**

2. TEKS 112.A.2.b.10.B -- Give examples of ways that rock, soil, and water are useful. Subject
   SEE Agriculture **Matches 6 items**
   SEE Natural resources **Matches 2 items**

3. TEKS 112.A.2.b.5.A -- Describes properties of objects and characteristics of organisms. Subject
   SEE Biology **Matches 1 item**
   SEE Matter -- Properties **Matches 4 items**

1.2 Search result set from term "water".

Bowie Elementary School

HOME HELP SEARCH BROWSE COMBINATION HISTORY CHANGE LIMITS

Display 1 to 10 of 11 items

Results filtered according to Limits.

Select an option to save result | **Sort Search Results By:** Publication Date

1. ☐ Raindrops / [by] Larry Dane Brimner ; ill. by David J. Brooks. Title (1999)

Location: BWE Reader R BRI Available

Annotation

2. ☐ The drop in my drink : the story of water on our planet / Meredith Hooper ; illustrated by Chris Coady. Title (1998)

Location: BWE Nonfiction 551.48 HOO Available

Reviews Annotation

3. ☐ A drop of water / by Walter Wick. Title (1996)

Location: BWE Nonfiction 546 WIC Available

Reviews Annotation