The Information Search Process: A Study of Elements Associated with Meaningful Research Tasks [gar]

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(reprinted courtesy of Libraries Unlimited from *School Library Media Annual*, 1995)

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Abstract

This investigation addressed the question, What makes a good research task,one that requires students to construct meaning from a variety of resources? The study involved collaboration between a high school media specialist, seven teachers, and a university faculty member. Six research projects involving 387 students of all ability levels were observed in Human Physiology, Honors English, Health, Grammar and Composition, and American Studies classes to identify elements associated with meaningful research tasks. Data were collected from a questionnaire completed by all students, and teacher interviews. Five elements were found to be related to satisfaction with the research process and to satisfaction with achievement.

Introduction

In the fall of 1992, Mary Gray, a school library media specialist, invited me to collaborate with her on a study focusing on the information literacy curriculum in her school district. The central question, as she phrased it was, What makes a good research task? To answer that question, she envisioned designing and examining classroom activities that involved students constructing meaning from a variety of resources.

One reason Gray and her colleagues at Holt High School are interested in information literacy is because they adhere to the principle of teaching for understanding, a central principle of professional development schools. Professional development schools are part of the education reform movement in the United States. They actively collaborate with university partners who are

members of the Holmes Group, a consortium of over 100 research universities. The universities enter into long-term cooperative arrangements with K-12 schools to effect school improvement through action research and preparation of new teachers in conjunction with their university colleagues. Holt High School is partnering with the School of Education at Michigan State University in East Lansing, Michigan.

Holt High School (grades 10-12) is situated in a suburb of Lansing and enrolled 927 students during the 1993-94 school year. It has a tradition of implementing innovative programs and was honored as an Exemplary Secondary School by the U.S. Department of Education in 1993. It was profiled in the January 11, 1993 issue of *U.S. News and World Report,* in "The Perfect School: 9 Reforms to Revolutionize American Education." Approximately 35 percent of its graduates continue their schooling at four-year colleges, while another 35 percent go on to two-year colleges. The district has a population of 20,437 and is middle-income. Half the adults have some college education; minority groups constitute 5 percent of the population.

The library media specialist collaborates with classroom teachers in lesson planning and team teaching. Their roles are evolving, as the school moves from textbook-driven to resource-based teaching and learning. The facility contains over 14,000 print and nonprint sources accessible through an automated catalog. In addition, a local area network provides students and staff with access to a variety of electronic databases in the media center and in individual classrooms and labs throughout the building. Telecommunications capability provides restricted access to the Internet and online databases beyond the confines of the school.

Kuhlthau's (1993, 15) case study of Manhasset Junior High School in New York found four basic school enablers contributing to its successful process-oriented library media program: 1) a team approach to teaching, 2) a constructivist view of learning, 3) a commitment to teaching for lifelong learning, and 4) competence in design of learning experiences for students. These school enablers are also in place at Holt.

Information Literacy

According to the American Library Association Presidential Committee on Information Literacy (1988), "To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate

and use effectively the needed information." Over the years, public and school librarians have observed that students often have trouble using information from resources other than textbooks. For example, school and public librarians have noted that students often experience difficulty in locating pertinent information when it is phrased differently from the wording used by their teachers in explaining the assignment. College and university librarians perennially observe that many students come to college lacking needed information skills. In addition, several U. S. government studies within the past several years have reported findings that are cause for concern regarding the level of literacy in the young adult and adult population. These studies validate librarians' experiential reports.

The Reading Report Card, 1971-1988 (National Assessment of Educational Progress 1988) is a U.S. government study based on the National Assessment of Educational Progress (NAEP). It found that most 17-year-olds can "carry out simple, discrete reading tasks," and that "86 percent can "search for specific information, interrelate ideas, and make generalizations." Only 42 percent, however, "can "find, understand, summarize, and explain relatively complicated information"; and only 5 percent "can "synthesize and learn from specialized reading materials."

Adult Literacy in America (National Center for Education Statistics 1993) is the first report from the National Adult Literacy Survey. It is based on interviews with American adults aged 16 and older. The survey measured 1) prose literacy:locating, understanding, and using information from texts such as editorials, news articles, and fiction; 2) document literacy: locating, integrating, and using information contained in items such as bus and train schedules, indexes, maps, and tables; and 3) quantitative literacy. Literacy was divided into three levels, according to the adults' demonstrated performance levels. More than 20 percent of adults interviewed performed in the lowest level of the literacy scales. Nearly one-third performed in the highest level. The two lowest groups experienced "difficulty with higher level reading and problem-solving skills. In particular, they were apt to experience considerable difficulty in performing tasks that required them to integrate or synthesize information from complex or lengthy texts." Surprisingly, however, the large majority of persons in the lowest groups said that they could read or write English "well" or "very well."

Writing is an activity that requires students to use information effectively, and thus is a component of information literacy. Recent results from a 1992 U.S. government study (National Center for Education Statistics 1994) show that

many students have “difficulty producing effective informative, narrative, and persuasive writing.” Even the best students had difficulty with persuasive writing tasks. The national sample consisted of fourth-, eighth-, and twelfth-grade students who performed a variety of writing activities.

The Holt Study

Teaching for understanding requires a shift away from the traditional teacher-centered classroom to a student-centered approach in which students are active learners, constructing meaning from a variety of resources and their own prior knowledge. Given this learning environment at Holt, it naturally followed that the study would involve close collaboration between the library media specialist and classroom teachers. School library media specialist Gray had already collaborated in planning and instruction, or both, in the Interdisciplinary Learning Community project and the Global Studies classroom. It was also essential to avoid artificial research topics set up expressly for the purpose of this study. Instead, Gray worked with classroom teachers within the existing curriculum to identify elements associated with effective research tasks, in which students are engaged and see value in what they are doing. The final products of these tasks included written papers, oral presentations, and a multimedia report.

Although this study was exploratory, it was our aim to include students of all ability levels and observe a variety of content areas so that the findings would present a more accurate picture of what might be happening than if we had only studied English classes or students of a particular ability level. Kuhlthau’s studies of the information search process (1985, 1989) and Irving’s nine-step model (1985, 30-31) influenced construction of the interview and survey questions that we developed.

Six research tasks undertaken by Holt students were studied during the 1992-93 school year. A total of 387 students in 18 course sections, and seven teachers were involved. All sections were heterogeneously grouped, with the exception of Honors English.

A variety of courses were observed: Human Physiology, English, Honors English, Health, Grammar and Composition, and American Studies. The Human Physiology research project consisted of an outline and an oral presentation of a respiratory system illness. The English classes wrote a position paper. The Honors English class wrote a research paper. The Health

classes wrote a paper and made an oral presentation about a disease. The Grammar and Composition classes wrote a creative piece describing an alien, its physical world, and its social environment. The American Studies classes prepared presentations in their choice of format after studying particular decades of the twentieth century.

To identify elements associated with effective research tasks, a survey was designed for all students to answer at the completion of their projects. Additionally, all participating teachers, and three to six students from each course, representing high, average, and low achievement levels, were interviewed. The intended purpose of the interviews was to gain deeper insight into students' responses to the surveys. Because the interviews generally lasted from 15 to 20 minutes each, the actual number of students interviewed per class was closer to three than six.

We used a three-stage model of the research process when constructing questions for the interviews and written questionnaires: Planning, Process, and Evaluation. The Planning Stage corresponds to Kuhlthau's (1985, 37) stages one and two: Receive Assignment (Task Initiation) and Select Topic, and to Irving's (1985, 30) step one: Formulation and Analysis of the Information Need. The Process Stage corresponds to Kuhlthau's (1985, 37) stages three through five, and to Irving's (1985, 30-31) steps two through seven. This stage covered everything from identifying potential sources of information to locating, using, and organizing information. The Evaluation Stage comprised Kuhlthau's (1985, 37) last stage, and Irving's (1985, 31) steps eight through nine. It covered the final product and students' feelings about it. The student questionnaire and the student and teacher surveys are reproduced in appendixes A, B, and C, respectively.

Background information about every class was collected. Preliminary information included teacher's name, course title, number of students participating, the theme/unit/topic being studied, the research task (assignment), and whether or not cooperative planning took place. It also included the teacher's list of student outcomes and prepared handouts.

Within the Planning Stage, we were interested in how students were feeling initially. We also hypothesized that the following elements might contribute to a meaningful research task:

1. students' understanding of the task,

2. their perceived connection between the task and other activities in the course,
3. whether they had any choices to make regarding the task, and
4. whether they felt they knew why their teacher wanted them to do this project.

Within the Process Stage, we were interested in finding out if students' feelings about the task had changed from their initial feelings. In this case, we wanted to test Kuhlthau's (1985, 37) model of students' feelings at various stages of the research process. We also wanted 1) to find out if students felt they needed more help in identifying resources, locating and using resources, and organizing information into a final product; and 2) to look at elements peculiar to the tasks that might explain students' feelings. Within the Evaluation Stage we wanted to find out how students felt upon completion of the task, and about their achievement and their product.

Our goal was to identify elements of research tasks that contribute to achievement and to feelings of satisfaction and achievement on the part of students, or that otherwise engage students in positive ways. This study was exploratory in the sense that we did not know what we would find. In fact, we could not find other investigations that addressed our goal.

Similar kinds of information were collected during interviews with the teachers involved. We were interested in teachers' perceptions and whether those perceptions matched their students' perceptions. Within the Planning Stage, we also wanted to learn why teachers decided to have students do a research project, why they designed the project as they did, and how the research would contribute to student outcomes (objectives).

Some teachers place greater emphasis on mechanics (footnoting and proper form for bibliographies), while others are concerned only with the end product. Many teachers place little or no emphasis on the process students use to arrive at the end product. Within the Process Stage, we were interested to learn if teachers thought students would need any help selecting and using information, and to learn what expected and unexpected results did teachers observed that was expected and unexpected during this stage.

Questions posed during the Evaluation Stage provided participating teachers with an opportunity to reflect on the entire experience. After the students' projects were completed, the teachers were asked questions about their perceptions of the strengths and weaknesses of the final products, and about

their ideas for interventions that might have improved the results.

Cross-Class Analysis of Results

Student responses on the written questionnaires were tabulated for each participating class, question by question. Responses to each question were totaled and recorded both as numbers and as percentages. The student and teacher interviews were used to further understanding of the questionnaire responses. Finally, a cross-class analysis looked for commonalties that might have led to feelings of satisfaction and achievement on the part of students. Our findings are tentative, due to the exploratory nature of the study, the small number of students and teachers involved, and the fact that activities were observed in only one school. We intended that findings from this study would be used in the design of a follow-up study, in which elements that we identified could be observed in a more structured investigation of their effects on student feelings of achievement and satisfaction.

Planning Stage

Statement 1. Four of the six classes agreed with the questionnaire statement that there was a close connection between the research project (task) and what they had been studying in class. Agreement ranged from 52.2 percent to 86.1 percent. Only students in the English classes disagreed, one class mildly (54.7 percent) and the other more strongly (81.9 percent). Students were more likely to acknowledge a connection if the topic was related to the subject content of the course rather than if the form of the product was related to a form of writing they had learned in that class (e.g., persuasive, narrative).

Statement 2. Only two of the six classes were looking forward to doing the task, with 52.8 percent in one class and 64.7 percent in the other class agreeing with the questionnaire statement. This finding supports Kuhlthau's (1989, 20) work; she described the initial stage of the research process as "characterized by feelings of uncertainty of what is expected and apprehension at the task ahead." The fact that two classes disagreed, however, opens the possibility that teachers can intervene to moderate these feelings. The elements that the two classes looking forward to the research had in common with each other and that distinguished them from the other four were that 1) students worked in groups and 2) they had been introduced to or had been studying the topic areas in class, in a more general way.

Statement 3. Five of the six classes agreed that they clearly understood the goals of the research project, with agreement ranging from 57.8 percent to 94.1 percent. Pre-task explanation appears to be the key here. Uncertainty was expressed by two of the three students interviewed in the class that did not understand the goals. It was difficult to determine the reason for this class's perception, based on the background information we collected from the teachers. Perhaps more explanation was needed. One student stated that the "directions were somewhat unclear." Complexity of the assignment may also have been a factor.

Statement 4. The same five classes understood how they would be evaluated, with agreement on the statement ranging from 58.0 percent to 93.6 percent. The class that disagreed was almost evenly split on this statement, with 52.2 percent disagreeing. It appears that if students understand the goals of a task, they also tend to understand how they will be evaluated on the task.

Process Stage

Statement 5. None of the classes expressed unhappiness about doing the research. Feelings were variable, however, ranging from 52.2 percent to 80.4 percent disagreement with the statement. It appears that the "happiest" classes were those that had more choices. The happiest class worked in groups and chose their topics. Of the two least happy classes, one had no choice of topic and the other was unsure of what to do with a novel (unique) assignment.

Statement 6. Five of the classes understood how to do the research project, with agreement with the statement ranging from 65.7 percent to 96.0 percent. One class rather strongly disagreed (77.4 percent). This class also did not understand the goals of the project. The research task may have contributed to these feelings. It required a very high level of thinking: students had to state and support a thesis.

Statement 7. One class agreed with the statement that they needed more help during the project (77.4 percent). With two exceptions, disagreement with this statement was mild, ranging from 54.8 percent to 80.0 percent. As might be expected, one of the two exceptions was the Honors English class. Another element that might have influenced the Honors class was the great amount of attention paid to process in this class. Students' comments as to what was helpful included: "spent a day discussing patterns of organization," "were told about sources," "a demo on the overhead," "Boolean."

One interpretation of the mild disagreement could be that more students (than cared to admit it), needed additional help during the Process Stage. After all, it is during this stage that students are not only identifying and locating information, they are also internalizing, or making sense of, the information. The interviews with teachers and students indicated, at a minimum, that students needed more help with process if the project was something they had never done before and if it required a higher level of thinking. For example, more help was needed with a position paper than with an informative paper that did not require evaluation of different points of view. Regarding the position paper, one student said, “It didn’t sound hard . . . didn’t seem like it would take too long ,” but the student was “surprised at the length of the project.” Another student “found plenty [of information], but it was hard to know what to keep and [what to] throw out.”

Comments like these coincided with some of the teachers’ comment. One teacher was disappointed that students were “unable to put things in [their] own words to show conceptual understanding unless [they] had a personal interest.” Another teacher noted that students were “craving for individual help” and that they “struggled with the position/argument format (higher order synthesizing).” Another stated, “Some don’t see a connection between question generation and research. Questions are just another assignment.” The same teacher thought that spending an entire class period on an introduction to the task, including modeling, would have improved results, as would have spending a day on peer editing. Another teacher remarked, “Some papers were very poor, like notes,” and commented more than once on the amount of regurgitation of information on the part of students, as well as on the problem of students contradicting themselves in their final products.

Statement 8. All classes agreed that they made good use of the time they were given in school to work on their projects. After considering all the information we collected pertaining to this statement, we decided that it provided little worthwhile data and that we would remove it from the questionnaire if we continued the study during the 1993-94 school year.

Evaluation Stage

Statement 9. Most of the classes agreed with the statement that they wanted to do a good job on their projects because they were interesting. No strong feelings were expressed in either direction, however. Agreement ranged from 63.6 percent to 77.6 percent. Of the two classes that disagreed, that sentiment

applied to 55.7 percent of one class and 58.5 percent of the other. We looked at the information collected about the classes that expressed the greatest extremes of opinion, to try to identify elements that may be associated with interesting assignments.

Choice and prior knowledge of topic appear to relate to feelings of interest. The classes expressing greatest interest had either been studying the general topic area or had been given some information about it by their classroom teacher prior to the research assignment. Of the two classes in which the majority of students did not express interest, one class had no choice of topic and the other had an assignment unlike anything they had ever done before. One could argue that students in both classes had little prior knowledge relating to their topics. In the case of the class with assigned topics, one student admitted to knowing "nothing about the topic."

Statement 10. All classes agreed that they wanted to do a good job on the project because the grade was important, with responses ranging from 81.7 percent to 95.7 percent of the students in each class. This statement illustrated the importance of extrinsic motivation for these students. We agreed that the statement provided little useful information and that we would, therefore, remove it from the questionnaire on any follow-up studies.

Statement 11. With only one exception, the classes were satisfied with their final products. Satisfaction varied widely, however, ranging from 52.9 percent to 94.1 percent in the five classes. The class in which 57.1 percent of students were not satisfied with their final products had a difficult assignment in that it called for a very high level of thinking: evaluating sources, sorting out fact from opinion, and coming to a personal decision on an issue. This class was the only one in which the majority of students admitted needing more help during the Process Stage. It appears that there may be a relationship between this statement and the following one.

Statement 12. The majority of students in all classes felt that their final products accurately showed what they had learned as a result of the project. Responses ranged from 51.5 percent to 96.1 percent. From the variety of responses exhibited in the student interviews, it appears that a number of factors may be interacting to produce these sentiments, such as "some things [that were] learned . . . didn't show in the paper," more help was needed during the Process Stage, and the difficulty of the project.

Statement 13. The majority of all six classes disagreed with the statement that they did not care if they did well on the project. Opinions stated here closely paralleled those of statement 10, ranging in disagreement from 80.0 percent to 95.2 percent. We feel that this statement was uninformative and that it may not have yielded valid responses because, of all the statements in the questionnaire, it was the statement most often left blank. We agreed to remove it from any future questionnaires.

Conclusions

There are a number of factors involved in students' feelings of satisfaction with research tasks and their sense of achievement upon completion of these tasks. Individual factors unique to each student, including intrinsic motivation; environmental factors such as school and home setting, and teacher personality; and task factors come readily to mind. This study was concerned only with task factors, those elements that comprise teacher-assigned research projects.

First, our findings supported those of Kuhlthau (1989, 37) in regard to students' feelings upon initiation of a research project. In general, students did not look forward to doing the project, but during the Process Stage students began to experience positive feelings toward their assignments.

Second, initial reservations about doing research may be ameliorated by giving students choices of topics rather than assigning topics to them. Prior investigation by Harter (1982), among others, may help to explain this phenomenon. She found that choice provides students with a sense of control, which has been shown to affect learning. We also found that students seemed to be more positive about embarking on a research project if they had used a similar approach previously.

Third, students were more interested in their projects if 1) they had been studying about the topic in class or had been given some topic background before the assignment and 2) they had some choice of topic, group, or both topic and/or group.

Fourth, students needed more help during the Process Stage if their topics required a higher level of thinking. One boy's topic choice provides an example:

Should the U.S. intervene in the civil wars of other countries? Locating information on this topic proved difficult.

Fifth, students were more satisfied with the research process if they 1) saw a direct connection between their topics and course content, 2) clearly understood the goals of the research project, 3) understood how to accomplish the research task, and 4) understood how they would be evaluated. Having an element of choice and working in groups also appear to be related to satisfaction, including feelings of achievement.

Sixth, the degree of heterogeneity in a class did not appear to affect student feelings or satisfaction in regard to the research process. We did find, however, that the Honors English class opinions were somewhat unique in that they did not closely resemble the questionnaire responses of any of the other classes. This finding may indicate that gifted students differ from others, but more research is needed before a more definitive statement can be made in this regard.

Finally, a less conclusive finding came out of the interviews. It appears that if students talk about the information they collect before developing the presentation, they are more likely to be satisfied with the research process.

In summary, we found the following elements to be related to satisfaction with the research process and to satisfaction with achievement:

- student choice of topic within the confines of the subject matter,
- group work,
- topics clearly related to course content,
- clear communication by teachers of goals and the means of evaluation, and
- attention to intermediate steps as well as to the final product (i.e., process instruction).

The above elements appear to be interrelated, but these findings are suggestive and await further study. A fruitful investigation would be to isolate individual elements that bear closer scrutiny, such as those listed above.

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Appendix A: Student Questionnaire

Directions: Read each statement, then write the number that represents your opinion on the blank line to the left of the statement.

1 = Strongly Agree
2 = Agree
3 = Disagree
4 = Strongly Disagree

_____1. There was a close connection between our research project and what we have been studying in the classroom.

_____2. I was looking forward to doing this research.
_____3. I clearly understood the goals of the research project.
_____4. I clearly understood how I would be evaluated on this research project.
_____5. I was very unhappy about doing this research.
_____6. I clearly understood how to do the research project.
_____7. I needed more help during the research project.
_____8. I made good use of the time I was given in school to work on this project.
_____9. I really wanted to do a good job on this project because it was interesting.
_____10. I really wanted to do a good job on this project because the grade was important to me.
_____11. I was satisfied with the product (paper, presentation) that I completed for this project.
_____12. The product (paper, presentation) that I created accurately showed what I learned as a result of this project.
_____13. I didn't really care whether or nor I did well on the project.

Appendix B: Student Interview Questions

Planning Stage

1. Did you have any choices to make for this research assignment? Did you choose the topic? Did you choose the form of the final product (paper, presentation, etc.)?
2. Did you understand what your teacher wanted you to do?
3. Why did your teacher want you to do this research?
4. What connection did you see between the research assignment and your other activities in this class?
5. How did you feel about doing this research when your teacher first discussed it?

Process Stage

1. Who helped you during the research process (teachers, media specialist, fellow students, others)? How did they help?
2. Were you told about or shown the *kinds* of information sources that might be useful (e.g., people, indexes to magazines, specialized reference books, encyclopedias, computer databases, etc.)? Would that have been helpful?
3. Were you told about or shown how to use different kinds of information

sources to locate useful information (e.g., electronic indexes, specialized reference books, etc.)? Would that have been helpful?
4. Were you told about or shown how you could track down articles and books you had identified as possibly having useful information? Would that have been helpful?
5. Were you told about or shown how to examine articles and books, and so on to determine if they would be useful? Would that have been helpful?
6. Were you told about or shown how to take notes or otherwise record useful information? Would that have been helpful?
7. Were you told about or shown how to organize and put the useful information you found into your own words (or into your own video, etc.) for the product (paper, presentation, etc.)? Would that have been helpful?
8. How well did you use the time you were given in school to work on this project? What would have motivated you to use your time in a more productive way?
9. How did you feel about this project when you were gathering information?

Evaluation Stage

1. What did you achieve by doing this project? What did you learn about the topic? What did you learn about research?
2. How did you feel upon completion of the project?
3. Were you satisfied with the product you created? Why?
4. Were you satisfied with the evaluation of your product? Why?
5. Did the product you created allow you to show what you actually learned? What alternative type of product might have been better?

Appendix C: Teacher Interview Questions

[Obtain background information: a description of the task, proposed outcomes, library/media specialist involvement in planning, level of student choice; copies of written materials prepared for the students; and daily log of students' activities.]

Planning Stage

1. Why did you decide to have your students do research? (i.e., What was your thinking?)
2. What did you expect to see the students accomplish (i.e., what outcomes did you expect to see) as a result of the research?
3. How do you expect that the research will contribute to the desired student

outcomes?
4. How will this research fit with the activities you were engaged with in the classroom?
5. Why did you design the project as you did?
6. Why did you choose the final product (paper, presentation) that you did?

Process Stage

1. Did you think the students would need any help to do the research? If yes, what kinds of help did you expect students would need?
2. Why did you design each day's activities as you did?
3. What did you observe, in terms of students' behavior and questions, that was expected? What did you observe that was unexpected?

Evaluation Stage

1. In what ways were you pleased with the effort that the students made on a daily basis? In what ways were you pleased with their final products?
23. In what ways were you disappointed with the effort that the students made on a daily basis? In what ways were you disappointed with their final products?
34. What do you think were the strengths of the final products? What were the flaws?
45. What interventions (written instructions, direct instruction, process explanations), if any, would have improved the results?
56. In what ways did the instructional design contribute to satisfactory research results? In what ways did the instructional design hinder satisfactory research results?