

Research Behavior of University Students

& the Information Search Process

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Abstract

Two local university students participated in a diagnostic interview about the research process. The interviews consisted of over thirty questions allowing the students to elaborate if necessary. Both students were female, in their twenties and in the first two years of undergraduate study. Student A, born in Mongolia, is of Asian ethnicity. Student B, born in the United States of America, is of Caucasian ethnicity. Both students were assigned research papers in two distinct classes. This paper is to determine whether the students followed a determined pattern of behavior in the act of research as outlined by Carol Kuhlthau's Information Search Process (ISP).

Research Behavior of University Students and the Information Search Process

Carol Kuhlthau illustrates in the Information Search Process (ISP) that all research is conducted in a six stage determined pattern which consists of variables including physical actions taken, cognitive thoughts, and "feelings experienced" (1991, p. 362, 2004, 2009). In April of 2010, two Utah Valley University students participated in a diagnostic interview to determine individual research techniques. The students had recently completed a research paper for and on differing subjects. Both students are female and in their early twenties. Student A is of Asian ethnicity and originally from Mongolia while Student B is of Caucasian ethnicity and born in the United States of America. The interviews consisted of over thirty questions (see Appendix D) covering actions, thoughts, and emotions behind the research process in an attempt to determine if there is a pattern to said process.

Information Search Process

In her article, "Inside the Search Process," (1991) and her book *Seeking Meaning* (2004) Carol Kuhlthau outlines the development of ISP which is founded on the theoretical principles of Kelly's Phases of Construction, Taylor's Levels of Need, and Belkin's Levels of Specificity as well as Taylor and Belkin's concepts of Expression and Kelly's Mood analysis. Kuhlthau outlined these methods in an easy to read table balancing each author's ideas accordingly (see Appendix A). The framework provided by Kelly et al. allowed Kuhlthau the opportunity to go one step further and delve into the psyche of the researcher or information user. In order to do so Kuhlthau determined that case studies would have to be performed for more accurate results. Five studies were performed over a period of several years. The first three studies included a group of students in high school, college and at the completion of undergraduate work. The

students in the college and post college studies were drawn from the original high school group (1991, 2004).

As part of the initial study Kuhlthau concentrated on how the students proceeded in two set research assignments. In order to get precise information from the students various formats were used including: journal writing, search logs, timelines, process flowcharts, and a questionnaire to "examine students' perceptions of six areas of library use: topic selection, research assignments, focus formulation, procedures for gathering information, frequency of library use, and role of mediators" (1991, p. 364, 2004). At the end of this study and after full examination of the participants' personal evaluations Kuhlthau states that, "A six-stage model of the search process was developed" (1991, p. 364, 2004) (see Appendix B). This model was tested and confirmed as to its longitudinal value on the same students during and at the completion of undergraduate studies (1991, 2004).

Knowing that the first studies were on a considerably small group of students Kuhlthau conducted another study involving students on various academic levels in order to find out if those circumstances had any affect as to how one researched. Although the research did not allow for an outcome in the lower academic levels, due to incomplete data, Kuhlthau determined that the students of moderate to high academic levels did follow the ISP (1991, 2004). Kuhlthau also remarked that, "Slight correlation was noted between increase in confidence and the teacher's assessment of focus in the papers . . . No correlation, however, was found between increased confidence and the quality and variety of the sources used in the papers" (1991, p.365). This can lead one to the conclusion that even though individual participants follow the same steps outcomes will be highly diverse based on criteria such as educational level.

The final study that Kuhlthau performed with M. W. George, B. J. Turock and R. J. Belvin broadened the reach of the ISP theory to include 385 institutions of public, academic, and school libraries that used such diagnostic devices as study surveys and questionnaires to track the participants' process (1991, 2004). In this study Kuhlthau concludes that, "Findings revealed a similar process across library users" (1991, p.365) while noting that, "half of the users . . . did not show evidence of reaching a focused perspective of their topic at any time during the search process" (see Appendix C) (1991 p. 369, 2004). In fact topic focus and gathering of information can continue through into the writing process.

In, her work, *Seeking Meaning* (2004) Kuhlthau mentions in the final study outcome that there is an apparent disparity between academic and school library users vs. public library users in that the public library users expressed a higher level of confidence in their research process. She attributes this to "the competence of more experienced, expert library users" (2004, p. 69). Kuhlthau relates this without any comment on whether age was a factor, i.e. adult public library users. It would not be surprising that adults no matter at what educational level, may possess a higher confidence level than children or adolescents.

In all five studies various aspects of the search process resonated throughout. This pattern includes six stages as outlined by Carol Kuhlthau in both *Seeking Meaning* (2004) and "Inside the Search Process" (1991). The six stages (see Appendices B and C) include: Initiation, Selection, Exploration, Formulation, Collection, and Presentation. Task Initiation relates, according to Kuhlthau, to an information need, i.e. being assigned a research paper. This first stage correlates to the emotions of uncertainty, thoughts of comprehension of the assigned task, and the action of picking a topic. The second stage, Topic Selection, relates to a necessary action to begin the research process while corresponding to the emotions of optimism, thoughts of

availability of information and topic interest, and the actions of initial topic. Third is what Kuhlthau refers to as Pre-focus Exploration where one narrows down the topic and can relate to the emotions of uncertainty and doubt, thoughts of gaining insight to general information on the topic, and actions of locating relevant information and note taking (1991, 2004, 2009).

After exploration Kuhlthau proceeds with the fourth stage of Focus Formulation, which she deems as a "turning point of the ISP" (1991, p. 367, 2004, 2009). Focus Formulation is where a topic is narrowed down into a relatable concentration area. Emotions that correlate to this stage can include confidence with thoughts of insight and interest while continuing in the actions of research and organization. The fifth stage is that of Information Collection where one narrows down the collection of information in support of the topic focus including emotions of increased interest, thoughts of accumulating accurate focused references, and actions including using the library and asking assistance of professional mediators such as a reference librarian. The sixth, and final, stage of the ISP is the Presentation which incorporates a search closure and submission of the research in the desired format. Emotions in this stage can range from satisfaction of a completed project to disappointment depending on factors employed in the previous five stages and any elements of procrastination that might have been involved. Thoughts can be characterized by knowledge of time while actions can include editing and actual presentation (Kuhlthau 1991, 2004, 2009).

Undergraduate Students

It should be observed that many of Kuhlthau's studies and the actual ISP model (see Appendix B) center themselves around academic work that can also be related to the career field, but have no vital relevance to ordinary everyday research activities, i.e. what phone and/or phone plan should I buy? The initial stages may have some relevance, however the later stages pertain

more to a set assignment with an expected presentation. In this vein, two undergraduate students were interviewed, both of whom had recently performed a research assignment, to determine if Kuhlthau's ISP still continues to be viable. Kuhlthau's various questionnaires in *Seeking Meaning* (2004) were consulted in preparing the interview questions (see Appendix D) which attempted to follow the search process from initiation to presentation gauging feelings, thoughts and actions. The following pertains to the interview of the two individual students. Each student is analyzed individually then evaluated against Kuhlthau's ISP model (see Appendices B and C). As according to the parameters of this paper both students will remain anonymous.

Interview with Student A

Student A is a twenty-three year-old Mongolian woman who is in her freshman year at Utah Valley University. Her research project centers on an assignment for an English course she has been taking during the 2010 spring semester. The student is not familiar with what the university library has to offer in regards to academic research, i.e. journals, databases, and Inter-Library Loan (ILL) and has not had any kind of library tour or class associated with library research. As a high school student in Mongolia she had no assignments that required the knowledge of research to the same degree that she is required here in the United States stating, "We don't really, like, write lots of papers in Mongolia so it's really hard for me to write papers" (personal communication, April 7, 2010). A contributing factor to her lack of use of libraries in her secondary years might be the transitory period of post Cold War Mongolia beginning in the 1990's (Johnson & Yadamsuren, 2010), although there is not enough information to come to a conclusion on the matter at this time.

Even though Student A has an appreciation for libraries it does not carry over to the research portions of her life. Her English teacher, who assigned the project that this interview is

based on, recommended a research writing class for her to take, but she has not done so at this time due to demands on her current schedule and lack of incentive (personal communication, April 7, 2010). Malenfant and Demers address this issue, in their article "Collaboration for Point-of-Need Library Instruction," stating that, "Some students initially considered the assignments "busy work", and apparently failed to understand the importance of the process in contributing to their education" (2004, p.p. 270-1). It is not certain whether or not Student A will take the class in the future, however, when pressed she only notes that "maybe" she would (personal communication, April 7, 2010).

In the process of selecting a topic and narrowing down the focus the student has developed a course of action to ease anxiety and compliment actionable results in her research process. Student A selected the subject of an argument paper from a list, provided by the teacher, which she then narrowed down the topic to be pro-marijuana centered on health concerns. She chose the topic due to the ease of gathering information as she freely admits that choosing harder subjects in the past only lead to a revising of her topic. Because she was not familiar with the library the student began and ended her search on the Internet stating, "I just Googled it" (private communication, April 7, 2010). When asked about accuracy of information on the Internet she stated that she chose sites that appeared to be official in nature. Because of her confidence levels in researching on the Internet the student mentioned that she would return to this process instead of going to a library in the future (private communication, April 7, 2010).

Due to her use of English as a second language Student A, although feeling prepared and well organized, if not rushed due to self inflicted procrastination, was more anxious during the actual writing process. She only sought help from someone other than herself at this point in time due to making sure that the composition of the research paper came out correct. Although

she learned various new and interesting details during the course of her research she excluded references in opposition to her topic's stance. Items that were previously overlooked were included due to perception that the information was more pertinent to her topic than other available information. When finished with her assignment Student A was no longer anxious because she was "done" with her paper (private communication, April 7, 2010).

Interview with Student B

Student B is a twenty-two year-old Caucasian American woman who is in her sophomore year at Utah Valley University. Her research project centers on an assignment for a Communications course she has been taking during the 2010 spring semester. The student is somewhat familiar with what the university library has to offer in regards to academic research, i.e. journals and databases; however was not aware of the availability afforded by ILL. Although she has not had any kind of university library tour or class associated with library research she did note that she had instances throughout her elementary and secondary education that touched on library resources (personal communication, April 18, 2010).

The student received the research assignment subject of Mass Communications in Society from her teacher; however she was responsible for narrowing down the topic for her paper and speech. Given the time frame allotted she contemplated her topic and began researching a few weeks prior to the due date. When beginning to research her initial topic the student found that the resources were limited. Unable to find what she believed to be a significant amount of information she changed her topic selection to something she was less comfortable with, but had more resources available (personal communication, April 18, 2010). The phenomena that Student B was experiencing could be what Kuhlthau refers to a "dip in confidence" (2004, p.205) experienced quite often during the initial exploration stage.

When asked if she received any assistance at any point in the topic selection process via a teacher or librarian Student B said that she picked the topic of media violence on her own which she narrowed down to concentrating on how the topic affected various age groups. The student did seek the help of a university reference librarian in order to narrow down search terms for the library's journal index. While she used the university library to research academic articles she visited her local public library for books on her topic (personal communication, April 18, 2010). It is unclear as to why she did not choose to select books at the university library.

Student B, although arriving at the public library close to closing time, related her admiration of the excellent service she received from the reference librarian. After finding book titles on the computer, the librarian walked the student into the stacks and showed her where the books were located. This was much appreciated by the student, who felt she might have got lost in looking herself (personal communication, April 18, 2010). The impression that the librarian made with the student is an indelible factor in reference success according to Durrance's article "Factors That Influence Reference Success" (1995) and Radford's *The Reference Encounter* (1999). As to her thoughts on the research process Student B stated that, "When I haven't had a good teacher being able to help me then I do turn to the librarian" and that, "Sometimes the librarian can help you better than the teacher, sometimes the teacher can help you better than the librarian" while bearing in mind that the library is more available than teachers tend to be (personal communication, April 18, 2010).

Accordingly Student B used a variety of references in her final project including personal interviews and Internet websites. Although she was wary of the opinionated nature of some web pages she was confident in the sources she ultimately used. When the writing process began the student admits that she could have used more time to gather more information, but believed she

had enough to "get my point across" (personal communication, April 18, 2010). As she did not use any kind of formal organization while researching and prior to composing her argument she did mention a slight shift in the final product. Student B also learned from her research and gained greater interest in her topic as she went along, sharing at length items of information that she both included and excluded from the paper portion of the assignment (personal communication, April 18, 2010).

Conclusion

Although both Students A and B are similar on several levels they differ in precisely two areas. The first is of nationality and the second is of personality. Obvious differences in culture have contributed substantially to the research process, i.e. previous experience of library research on the secondary level. However, personality types can also affect the process. In observation of the two students on previous occasions the interviewer notes that Student A appeared to be introverted and Student B appeared extroverted. These observations were confirmed by a non-scientific Myers-Briggs Personality Test performed by both students prior to the interview (Similar Minds, n.d.). According to the test results, as reported by individual students, Student A is classified as an Introverted iNtuitive Feeling Judging (INFJ) personality and Student B as an Extroverted Sensing Feeling/Thinking Judging (ESFJ or ESTJ) personality.

The individual personality types may play a role in the differing research processes of the students. Student A, as an introvert, may not have felt comfortable going into the library to ask for assistance with her research, whereas Student B asked two librarians at two different libraries for assistance when she needed it. Personality type also may be a factor in the process of topic selection. While Student A went at first with what she perceived to be the easiest route, Student B had to change her topic after beginning the initial search process. Ultimately both students

admit to being concerned with ease of reference acquirement, and organization of the writing process (personal communications, April 7 and 18, 2010).

Both Students A and B followed the basic pattern of the ISP modeled by Carol Kuhlthau (see Appendix B). The students acknowledged an increase in levels of anxiety at the initial task assignment, decreased anxiety after topic selection and the beginning of the research process (personal communications, April 7 and 18, 2010). Confidence increased throughout the research process as both students gained an interest in their individual topics. At the writing portion of the project anxiety rested mostly with the actual writing portion, whereas both students felt as though their research was competent even though they admit more time for research would have helped while acknowledging that they were responsible for delaying the research process in the first place. Both Students A and B also admit to a great relief and satisfaction after their respective assignments were completed (personal communications, April 7 and 18, 2010).

A course in library research may be beneficial for both students in improving their techniques. Kuhlthau surmises that the ISP can be used as a framework for courses in library research which can lead to a greater confidence and use of the library (2004) a sentiment echoed by Malenfant and Demers (2004). Although a research writing course is mentioned by Student A during her interview (personal communication, April 7, 2010) no existence of said course could be independently confirmed by the interviewer. It is also indeterminable to what extent library research would be covered by said course. When questioned as to whether she knew of any such course, Student B was unaware any existed (personal communication, April 18, 2010).

While unable to find any specific courses in library research or undergraduate research writing the interviewer did notice that the Utah Valley University Library website not only had

links for ILL, journal indexes, and live chat, but also tutorials encompassing a wide range of research activities (2009). Both students seemed intrigued by the concept of ILL (personal communications, April 7 and 18, 2010) and Student A showed interest in learning about the availability of journal articles online. However, Student A was not interested in the live chat, commonly known as ask a librarian, offered on the library's website (personal communication, April 7, 2010). It is not known to what extent, if any, of experience either student had with the university library's webpage.

As the interviewer it was interesting to note how others, such as Students A and B, complete a research assignment from the standpoint of both personal and professional interest. Learning of a variety of ways individual library users and non-users search for information gives insight to the ISP. Both students exhibited emotions, thoughts, and actions that fell in line with the stages of Initiation, Selection, Exploration, Formulation, Collection, and Presentation included in the Kuhlthau's ISP model (see Appendix B). While Carol Kuhlthau's Information Search Process is best applied to academic research it is as relevant today as when she first developed the model over twenty years ago.

Appendix A

Theoretical Foundations for Information Search Process				
1 Phases of Construction (Kelly)	2 Levels of Need (Taylor)	3 Levels of Specificity (Belkin)	4 Expression (Taylor, Belkin)	5 Mood (Kelly)
Confusion	Visceral	Anomalous States of Knowledge		
Doubt	Conscious		Questions Connections	Invitational
Threat		New Problem New Situation Experimental Needs		
Hypothesis Testing	Formal		Commands Gaps	Indicative
Assessing	Compromised	Defined Problem Well Understood Situation		
Reconstructing		Informative Needs Coherent State of Knowledge		

(Kuhlthau, 1991, p. 363)

Appendix B

Model of the Information Search Process

	Initiation	Selection	Exploration	Formulation	Collection	Presentation
Feelings (Affective)	Uncertainty	Optimism	Confusion Frustration Doubt	Clarity	Sense of Direction/ Confidence	Satisfaction or Disappointment
Thoughts (Cognitive)	Vague	—————→		Focused	—————→	
					Increased Interest	
Actions (Physical)	Seeking	Relevant	Information	Seeking	Pertinent	Information
		Exploring	—————→		Documenting	

(Kuhlthau, 2004, p. 82, 2009)

Appendix C

Information Search Process (ISP)

Stages in ISP	Feelings Common to Each Stage	Thoughts Common to Each Stage	Actions Common to Each Stage	Appropriate Task According to Kuhlthau Model	Task as Reported by Study Five Participants
1. Initiation	Uncertainty	General/Vague	Seeking Background Information	Recognize Information Need	Gather
2. Selection	Optimism			Identify General Topic	Gather
3. Exploration	Confusion/Frustration/Doubt		Seeking Relevant Information	Investigate Information on General Topic	Gather/Complete
4. Formulation	Clarity	Narrowed/Clearer		Formulate Focus	Gather/Complete
5. Collection	Sense of Direction/Confidence	Increased Interest	Seeking Relevant or Focused Information	Gather Information Pertaining to Focus	Complete
6. Presentation		Clearer or Focused		Complete Information Search	Write or Present

(Kuhlthau, 1991, p. 367 and p. 369, 2004, p. 67)

Appendix D

Diagnostic Interview:

1. What year of university are you in?
2. Have you had any library education in your time in university (i.e. a tour or a structured class assignment pertaining and including library research)?
3. Have you had any library education in high school?
4. How was your research paper assigned (i.e. pick your own topic, pick topic from list, or assigned topic)?
5. Why did you choose your particular topic (i.e. ease, curiosity, etc.)?
6. Did you feel any anxiety about picking your topic?
7. Did you ask anyone's advice before picking your topic (i.e. teachers, librarians, fellow students, friends or relatives)?
8. What was your topic?
9. Did you feel any anxiety after you picked your topic?
10. Did you delay beginning to research your topic? Why/Why not?
11. Where did you begin your research (i.e. library or Internet)?
12. Did you use the university and or public library during your research?

13. Did you ask for help in your research from a reference librarian? Teacher? Others?
Why/Why not?
14. Did you consult any online databases during your research (journal articles)?
15. Did you know that you could get a book title not available at the library through Inter-Library Loan (ILL)?
16. If you used Internet sources (web pages) did you feel confident that they were accurate?
17. Were you able to narrow your topic down to a central theme for research?
18. Did you have any anxiety in narrowing down your topic?
19. Did you feel as though there was enough information on your topic or that you might have to change your topic at any time?
20. Did you become more or less interested in your topic as your research went on? Why?
21. Did you feel more or less confident in the research as it progressed? Why?
22. Why did you stop your research process and begin to write the paper (i.e. time, out of sources, or enough sources to complete job)?
23. Did you feel as though you were ready to write the paper or if you had more time you could do a better job?
24. Before writing did you have a clear idea as to where your paper was going to go and what information you were going to use in each area (i.e. notes or outline)?

25. When writing did you return to any sources that you had earlier dismissed in the research process?
26. Did you return to the library for more material?
27. Did you ask anyone for assistance during the writing process (i.e. teacher or librarian)?
28. Did the paper come out as planned or did it shift directions?
29. Did you feel you learned anything in researching and writing this paper?
30. Did you learn anything you did not include in the paper?
31. Did you feel more or less anxious after the paper was written? Why?
32. Is there anything you would change about your research process for next time?
33. Next time will you consider talking to a reference librarian at the beginning of your research process? Do you think it could make a difference?

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