

The serendipitous research process

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Abstract

This article presents the results of an exploratory study asking faculty in the first-year writing program and instruction librarians about their research process focusing on results specifically related to serendipity. Steps to prepare for serendipity are highlighted as well as a model for incorporating serendipity into a first-year writing course.

"Serendipity. Look for something, find something else, and realize that what you've found is more suited to your needs than what you thought you were looking for." Author Lawrence Block

Introduction

The term serendipity was coined by the English writer Horace Walpole and refers to the “knack of making fortunate discoveries unexpectedly, by accident or coincidence.”¹ There are many mentions of serendipitous discoveries in the science literature but how does serendipity happen in library research? An exploratory study was undertaken at George Washington University, consisting of interviews with faculty in the first-year writing program and instruction librarians. Although the original purpose of the study was to discover how faculty and librarians used similar terms differently the topic of serendipity was a common thread through the interview responses. This led the authors to question how serendipity can be encouraged in the research process and if it can be incorporated into the structure of a first-year writing course. This article will provide an overview of the literature on browsing, serendipity, and information encountering; present the results of the exploratory study asking faculty and librarians about their research process focusing on results specifically related to serendipity; discuss serendipity as a research method for students; describe how to prepare for serendipity; and articulate a model for incorporating serendipity into a first-year writing course.

Literature Review

Browsing

Browsing can be an avenue for serendipitous discoveries. A key work on browsing is Apter's article on general purposive browsing which is defined as the “planned or unplanned

examination of sources, journals, books or other media, in the hope of discovering unspecified new, but useful information.”² The author differentiates between browsing and serendipity defining the latter as a more accidental discovery.³ Browsing is referred to as an “untidy operation” and Apter notes differences in browsing within disciplines and potential ways browsing could be evaluated. The conclusion states that browsing is an “important source of creative ideas.”⁴

Serendipity

The majority of the literature focusing on serendipity is in the sciences. However, there have been several articles in the library literature that focus specifically on serendipity and the research process.

Liestman proposes six approaches to library research serendipity, each of which focuses on “finding something other than what one is searching for and expanding it to include finding desired information via unexpected means.”⁵ Three approaches to serendipity give no credit to the researcher: coincidence, convenient grace, and synchronicity.⁶ The remaining three methods do give credit to the researcher: perseverance, altamirage, and sagacity. Perseverance is described as the most thorough and comprehensive model but is also cumbersome and lacking in refinement.⁷ As the name implies, the longer a person continues their search the more likely they are to experience serendipity. Since the process is so elaborate and long, Leistman cautions that a searcher must recognize when they have reached the point of diminishing returns. Altamirage relies on unorthodox and idiosyncratic research behaviors that lead to serendipitous or happy accidents.⁸ Liestman writes that altamirage is “predicted on the facility of the researcher for encountering serendipity as the result of distinctively personal habits, character, knowledge, or

other individualized traits.”⁹ The example Liestman gives for this approach is that of an archeologist who through browsing the library stacks every two weeks discovered an article from economics, an unrelated discipline, which related to his thesis topic. The sixth approach to serendipity is sagacity which requires “intuition and skill on the part of the researcher but without the numbing thoroughness of perseverance or altamirage’s specialization.”¹⁰ This approach relies on the enthusiasm of the searcher for the topic, flexibility in thinking, sensitivity to serendipitous clues and a desire for discovery.¹¹ Sagacity is the most feasible method and the one most likely to be used by reference librarians. Liestman closes by discussing serendipity’s stigma wondering “how many librarians really want it known that they just happened to stumble across a citation rather than locating it as a result of a sophisticated search strategy?”¹²

An empirical study of academic and postgraduate researchers by Foster and Ford focused specifically on serendipity.¹³ They discovered that serendipity in searching could have the effect of either reinforcing or strengthening the researcher’s existing problem, conception, or solution; or of taking the researcher in a new direction, in which the problem conception or solution is re-configured in some way.¹⁴ Among the authors’ conclusions are that serendipity is widely experienced among inter-disciplinary researchers and that certain attitudes and strategic decisions are perceived to be effective in exploiting serendipity when it occurred.¹⁵

Cooksey focuses on serendipity in the digital library.¹⁶ She discusses how OPACs and online article databases try to encourage serendipity by providing cross-links.¹⁷ Also mentioned is the linking of subject headings, authors, and series in the library catalog to encourage browsing. Another point mentioned by Cooksey is that “if true serendipity is one’s discovery of something new, combined with the realization of a connection between it and something one already knew, perhaps the library user’s discovery of the existence of entire databases is a form of

serendipity.”¹⁸ She concludes by stating that librarians can assist in creating conditions to facilitate serendipity.¹⁹ One of the most recent articles on serendipity in the library literature is by McBirnie, who explores the connection between serendipity and the paradox of control.²⁰ Through empirical research using semi-structured interviews, the author provides definitions of serendipity, outlines a process aspect of serendipity, and relates the findings to control and information literacy education.

In her essay on Socratic inquiry and the pedagogy of reference, George argues for “approaching serendipity as a viable and deliberate strategy for the facilitation of information retrieval.”²¹ She writes that the traditional methods of teaching research are “so mechanical, so dubiously precise, so lacking in the rough edges, the messiness, the element of surprise that so often characterizes the most satisfying and worthwhile discoveries. There seems little room for the happy educational accident, the serendipitous windfall.”²² She provides strategies for helping students understand research as a true process for discovery, drawing on Liestman’s six categories of serendipity as well as Ford and Foster’s observations that much that has been characterized as serendipitous relies on prior organizational systems (as in browsing) or personal habits (as in an individual’s quirky research process) that can be identified and taught. She then argues that reference librarians should employ a more Socratic approach to working with students as this method can help prepare them for serendipitous experiences.

Information seeking

Theories of information behavior articulate the many ways that people search and find information. Many of these theories include references to information found accidentally or through chance, which aligns closely with serendipity. Three specific theories by Bates, Ellis,

and Erdelez are covered to provide an example of how this accidental information behavior or serendipity could be incorporated in information seeking.

In her work on berrypicking Bates argues that real life queries change and evolve during the course of searching. Berrypicking is defined as a “bit-at-a-time retrieval”²³ and differs from a traditional model in that the question is evolving and the search process changes instead of there being a best retrieved set. She writes that

each new piece of information they encounter give them new ideas and directions to follow and consequently, a new conception of the query. At each stage they are not just modifying the search terms used in order to get a better match for a single query. Rather the query itself (as well as the search terms used) is continually shifting, in part or whole.²⁴

Bates goes on to describe methods of berrypicking using a search interface. She discusses browsing, citation searching, journal runs, area scanning, and subject and author searching. She concludes by stating that the berrypicking model is different from traditional models in that typical searches evolve, searchers gather information in bits and pieces, and searchers use a wide variety of search techniques and sources.²⁵

Ellis developed a model of information seeking behavior based on studies of the information seeking patterns of academic researchers in the sciences, social sciences, and humanities.²⁶ There were similarities found across disciplines in the research behavior of academic researchers. These similarities are the basis for Ellis’s model of information seeking which includes six types of activities. The first activity is starting or beginning the search for information. This can include using informal contacts, conducting a literature review, or using references provided by a colleague or supervisor.²⁷ The second activity is chaining, which includes following the chains of citations either forward or backward. Forward chaining is the finding of citations in which a source material is cited while backward chaining is following the list of references in a given

article.²⁸ Browsing, or semi-directed searching in area of interest, is the third activity. Browsing can be used to become familiar with a topic or to maintain awareness in a field.²⁹ The fourth activity is differentiating or using “differences between sources as a filter on the nature and quality of the material examined.”³⁰ Monitoring, the fifth activity, is the process of maintaining awareness by regularly following particular sources.³¹ The last activity, extracting, is a focused “behavior of going through a particular source and selectively identifying material from that source.”³² Although the model does not address cognitive or affective aspects of information seeking, the “employment of a consistent methodological approach across the different studies, indicate that the approach represents a broadly based, robust, and widely applicable way of modeling the information-seeking behavior of researchers in both academic and industrial research environments.”³³

Erdelez describes information encountering as “memorable experiences of accidental discovery of useful or interesting information.”³⁴ Her study used surveys and in-depth interviews and covered four dimensions of an information encounter: the user dimension, the environment dimension, the information dimension, and the analysis of information need dimension. Her findings identify four groups. The super-encounterers were “respondents who very often experienced information encountering, who relied on it, and considered it as an integral element of their information behavior.”³⁵ Encounterers were those who experience information encountering yet did not perceive a connection to their own searching behavior. Occasional encounterers are those that perceived encountering as a happy accident and the nonencounterers who rarely or seldom encountered information.³⁶ Erdelez states that the super-encounterers felt others could benefit from information encountering.

This overview of the literature has covered browsing, serendipity, and information behavior. The literature on browsing and information behavior is important to the discussion of serendipity because while these authors describe the accidental encountering of information they do not mention serendipity specifically or if they do it is to differentiate either browsing or information behavior from serendipity. The library literature on serendipity is sparse and features only two empirical studies. There is a gap in the existing literature on serendipity in library research, on describing faculty's definitions of serendipity, on their perception of serendipity for students, and on how to prepare students to experience serendipity.

Background: University Writing Program

In 2002 the George Washington University released an aggressive strategic plan for academic excellence designed to enhance the intellectual engagement of undergraduate students. Part of the strategic plan called for the development of a new writing program that would usher in a new culture of writing at the university. The new University Writing Program (UWP) includes University Writing 20 (UW20), a four-credit, one semester course required of all freshmen and two Writing in the Disciplines (WID) courses that students take during their sophomore, junior or senior years. To ensure engagement and optimal learning the UW20 courses are capped at 15 students per section.

UW20 has multiple research-related course objectives including developing or extending the following skills:

- Capacity for critical reading and for analytic thinking that examines assumptions and evidence, in both scholarly texts and informed public commentary

- Ability to explore information resources through both traditional library and emerging technological sources, to use them effectively, and to acknowledge them correctly
- Practice in the writing tasks of framing sound questions or hypotheses, analyzing and synthesizing information that can be brought to bear on the chosen question, preparing and repeatedly revising drafts to achieve clarity and coherence or argument, and citing others' work with integrity.³⁷

An important part of the program is the partnership between faculty and instruction librarians. Each semester faculty and librarians are paired according to interest and research expertise. They are encouraged to collaborate at all stages of the course including choosing course texts, devising effective research assignments, and planning and teaching information literacy sessions. Every semester each course section meets in the library between two to four times and the librarians introduce research techniques that are tied to the section's upcoming writing assignments. Some librarians also hold office hours and attend some classes during the semester. During the annual summer faculty workshop, librarians and faculty meet to review program goals and explore best practices for teaching writing and research.

Faculty in the UWP come from multiple disciplinary backgrounds including history, philosophy, American Studies, English literature, rhetoric and composition, folklore, and Caribbean studies among others. The librarians involved also have diverse disciplinary backgrounds. In addition to their MLS degrees, GWU librarians have degrees in art history, international affairs, English and journalism. During the 2004-2005 academic year, the year in which this study was conducted, the UWP had fifteen fulltime and ten part-time faculty and four graduate teaching assistants; eight academic librarians also worked with the program.

Exploratory Study

In the summer of 2005 Jennifer Nutefall, then the Instruction Coordinator at Gelman Library, and Phyllis Mentzell Ryder, then the Acting Director of the First-Year Writing Program, conducted an exploratory study to identify terms that might be interpreted in divergent ways by faculty and librarians. Those eligible to participate in the study were faculty in the first-year writing program and instruction librarians. A call for participants was distributed through the first-year writing program listserv, which included all UWP faculty and instruction librarians. A brief description of the study was provided in the message as well as the timeframe for the interviews. The researchers' goal was to interview faculty and librarians who had collaborated in the past academic year and who represented a range of teaching philosophies. The researchers followed-up with faculty and librarians who responded and also proactively asked faculty and librarians if they were interested in participating to increase the diversity of the sample. A total of seven interviews were conducted with four UWP faculty and three Instruction Librarians who represent a diversity of disciplinary training. Everyone was employed fulltime in renewable multiple-year contracts except for faculty 2 who is a part-time faculty member (see Appendix for participants' demographic information).

Syllabi and writing assignments were collected from the faculty and research session lesson plans from the librarians. Two-hour long interviews were conducted with each participant and participants were asked to:

- Describe their own academic training
- Explain the steps they took to complete a recent research project

- Identify the differences they saw (if any) between faculty and student writing and research
- Offer their pedagogical approaches to various stages of the research process
- Provide definitions for a series of key concepts including information literacy, critical thinking, and keywords

During the interviews participants were asked to use the terminology they were most comfortable with and to share examples of occasions when they recognized that their use of a term differed from others' uses of it. By conducting the interviews jointly, Nutefall and Ryder hoped to encourage participants to use the terms they would use within their own programmatic conversations. At the same time, participants provided clarification and translation of concepts across those discourse communities.

The interviews were recorded and transcribed by Ryder. The transcripts were coded and analyzed, along with the assignments, syllabi, and lesson plans, for themes. There are two main limitations of this study. First, this study used a convenience sample, defined as a group of individuals who are available for the study.³⁸ The limitation of a convenience sample is that the population is not representative so the findings cannot be generalized. To overcome this limitation this study should be replicated using different groups of faculty and librarians. The second limitation is that the authors knew the participants.

Results: Serendipity for Faculty and Librarians

All four of the faculty and one librarian interviewed mentioned serendipitous moments in a laudatory way. In describing their own research projects participants described moments where they came across unexpected materials that directed their projects in new ways. Three kinds of

serendipitous research moments were identified by Nutefall and Ryder: chance, mystery investigation, and browsing.

Chance, which could also be thought of as luck or randomness, can lead to surprising connections. This kind of serendipitous moment was described by Librarian 3 who explained, “I also like serendipity in research and using things you just stumble upon. Because sometimes those connections are most interesting, that you’re bringing in something no one else would, because you found it kind of by accident.” For Faculty 4 chance can lead to new conceptual frameworks. She described a process of using one kind of text or theory to serve as a lens for examining another text or event. The lens implies both a methodology and a particular perspective and can be a feminist lens, a Marxist lens, the lens of ethnic studies, and so on. A researcher can serendipitously come across a lens that is not an obvious one for the object under study but which allows one to see that object in strikingly new ways. With chance there is no given method for coming across the object but there is a particular sort of disposition at work in that the researcher needs to cultivate a mind-set that examines a range of unusual sources as potential contributions to the research project.

The second kind of serendipity mentioned was mystery investigation, which is where information is learned from detecting. Faculty 2 described mystery investigation as following a series of clues. She said

For me, I’m a real research junkie. I loved tracking down 2000 footnotes for my dissertation. . . it was kind of a mystery investigation kind of thing, because one clue would lead to another clue would lead to another clue. And I love that path, I love following that path.

As an example, Faculty 2 described how for her dissertation she hunted down a reference to an elephant in Dublin, found that it was an elephant who caught on fire in 1696, traced the first

newspaper that talked about the fire and the elephant, and then “stumbled across a track” that described the events. There is a methodology in this research in that each source directs one to the next and where bibliographies or citations are mined for additional sources.

The final kind of serendipity mentioned was browsing. Browsing can occur in any environment and involves a casual search for items of interest without clearly defined intentions.³⁹ Faculty 3 discussed his experiences with browsing.

I think one of the things I know how to do in a library that my students don't—and we've talked about this in the writing program—is to browse. Because they're used to information on demand, and they're used to info that has a very specific trajectory from your knowledge request, to its location, [and] back to you. Carol has talked about . . . telling them “if you go to a place that's got one book, look at the shelves”— things like that. That was something I picked up really early in my grad career and I've always done that, is going to the shelves and troll[ing]. And sometimes I find things that send me off on whole new research tracts. And that's kind of the serendipity function that we're kind of losing with many sorts of knowledge formation.

There are many different ways of incorporating browsing into one's search process in either the print or electronic environment. Browsing can be a systematic and planned activity such as scanning the book shelves or a more casual activity such as electronic browsing based on terminology or results retrieved.

The three types of serendipity identified by the researchers, chance, mystery investigation, and browsing, require either the development of a certain habit of mind or methodology that allows the accidental discovery of information to happen. The faculty and librarians in the study identified the positive aspects of serendipity in conjunction with their own research experiences.

Results: Serendipity for Students

How did faculty and librarians view serendipity in the research process of students? When describing examples of interesting student research experiences, faculty and librarians

emphasized those in which students did not proceed in a linear fashion but instead worked through a recursive process of research and inquiry and seemed to stumble onto their arguments in unusual ways. This description matches the research by Bates who describes the evolving search writing “each new piece of information they encounter gives them (the searcher) new ideas and directions to follow and, consequently, a new conception of the query.”⁴⁰ Although the faculty described serendipitous opportunities for students in a positive manner, one librarian viewed a student’s serendipitous process negatively.

Starting research without a specific question is one way that faculty feel allows students to experience serendipitous moments. All the faculty in the study discussed how the starting point for research is not a narrow question but a large and at times unwieldy topic that must be refined through many trips to the library and online sources as the student becomes more familiar with the materials and discourse of the issue. Faculty 2 mentioned how she talked to her students about starting with a series of questions about a larger topic and then gathering information with those questions in the back of their mind. She provided an example of how this might work saying:

So, for instance, marketing and teens. So they [students] might start with some questions: Who markets what to teenagers? Who markets teenagers to themselves? Who markets teenagers to adults? Then, as they’re starting to look at the literature that’s been published on marketing strategies or looking at primary sources and looking at how certain things are geared towards a particular audience to try to get them to buy this or that. And then, hopefully, a picture will start to develop and one element of that picture will be the one they want to pull out and say “oh that really interests me” or “that really excites me.”

Faculty 4 talks about the approach she uses with students saying:

You’re going to start with a series of questions that you’re interested in exploring. They’re probably going to be very general. They will become more specific as you develop more specific interests and as you start to know an area or a debate or a field or whatever you are looking at, you will refine them. A good research question is one that will develop.

The faculty members' desire to delay students' formation of a research question seems tied to a concern that students will arrive at a focus prematurely, before they really understand the scope of the issue, and that this premature focus will shut off potentially productive avenues of research. If students are too organized, they may revert from writing an exploratory research paper, in which they discover a perspective and test it out, to writing a research report in which they list evidence in support of a predetermined concept.

Not all student experiences with serendipity are seen as positive and can be interpreted as a sign that a student is struggling in their research. For example Librarian I uses the term serendipity in a negative way:

Just yesterday, I had a research assistance appointment with a graduate student who was doing doctoral work [and] was clearly clueless about how to go about this. She is just taking the information gathering approach. She showed me all the wonderful things, stuff that she had. And when I asked her to walk me through the process of all the things she had to do to acquire that material, it was quite serendipitous and so eclectic that it really – so I actually did what I called bibliotherapy.

Librarian's I response indicates that they view serendipitous research as a novice method. The student research behavior described here is in line with Bates "berrypicking" model of information retrieval in which the student got information through a series of ever evolving searches.⁴¹

Librarians and faculty should consider discussing with students their own experiences with research giving them the opportunity to describe it not as a linear process but one that is messy and recursive.

Preparation for Serendipity

Faculty and librarians can help students prepare for serendipity and for the messy process of discovering a research question. Three strategies that can prepare students for serendipity include the development of a rhetorical disposition towards sources, a sense of the rhetorical relationships among sources in a field, and strategies for accumulating background knowledge.

The first component in preparing for serendipity is the development of a rhetorical disposition towards sources. The key component that faculty emphasized in describing the research disposition they sought to inculcate in their students was an analytical mindset through which students view the materials of their study. In other words, they want to push students to see research as an exploratory, generative activity, rather than a summary of facts. Their approach to research was one in which each text was viewed as part of a larger conversation, and part of their role as researchers was to map out the relationship among the authors and to evaluate the methods authors used to arrive at their positions. In short, faculty emphasized research as a process of critical information literacy. As Faculty 1 said, students need to read for arguments, rather than reading for facts. This is in line with Simmons and her article on librarians as disciplinary discourse mediators.⁴² She wrote that “we need to communicate to students – both explicitly through explanation and implicitly through modeling – that research is not about finding information or facts . . . but instead that research is about constructing meaning through active engagement with the ideas and asking questions surrounding the information itself.”⁴³

Students also need to get a sense of the rhetorical relationship among sources in a field. Both librarians and faculty described how students’ writing projects come together once students have a grasp of their rhetorical purpose in taking on the project and when they recognize how particular resources will help them bring their arguments most effectively to their readers. As an example, Faculty 1 describes how a student recognizes a need for discrete information resources

when she or he has developed an argument that now requires particular proof. Likewise, for Librarian 1, a consideration of the organization of the overall argument helps the student understand the kinds of sources that will be needed.

Finally, students need strategies for accumulating background knowledge that will offer them a sense of the range of arguments in the field. Simmons suggests that librarians can assist in teaching students to recognize the rhetorical significance of disciplinary genres. She writes that “by articulating and making visible the epistemological differences in research in the disciplines, librarians can facilitate students’ understanding and their scholarly work within a particular discipline.”⁴⁴ In the UWP such work need not be left to the librarians, because the thematic structure of the writing courses provide the context in which faculty can work with students to trace out the larger networks of relationships within a particular area of study. By the time students need to conduct their independent research within their field, they should already be familiar with key sources, some big names, and the discursive moves of the field.

Assignments within the thematic course can also introduce students to background information in such a way as to highlight the arguments in a field. For example, students might study a variety of timelines about a particular historical period or examine a collection of overviews and consider why different events are emphasized in each one. Some of the research strategies that faculty and librarians describe as part of their own methodology can be taught to students. In particular faculty and librarians can devise assignments to introduce students to:

- *The art of browsing books*: How can you use the catalog to find an appropriate section of the library for browsing? How do you choose which texts to look at? How do you evaluate a book through its table of contents and index? How do you skim chapters?

- *The art of browsing scholarly articles*: What are the general organizational structures of scholarly articles in the field? Where might they find a section on the review of the literature? What indicators do scholars use to highlight their own position? Where might scholars consider counterarguments, and how are those indicated?
- *The art of following bibliographic trails*: How might students identify the scholarship associated with a particular line of arguments in a text?
- *The art of using databases to decode disciplinary approaches*: How to enter key terms into a range of disciplinary databases to see what kinds of articles show up and how to decode the results so as to see the different disciplinary arguments about an issue
- *The art of keyword analysis*: Critically analyzing the ways that databases and disciplines use key terms

Conclusion: Serendipity in Context

Serendipity is a method of research that many academics have incorporated into their own information seeking behavior. Yet there is still a stigma attached to serendipity and its role in the research process. Erdelez mentions this reluctance when discussing super-encounterers. She writes that their habit of encountering is not “something they are willing to talk about casually, mainly because information encountering does not adhere to the traditionally prescribed methods for finding information.”⁴⁵ She continues by stating that people who use encountering (and we would say serendipity) as a method for information retrieval are concerned that they will be ridiculed if they tell others about their method.

What would it take to make serendipity more widely accepted? First, serendipity should be considered just one aspect of the research process in that it is used in conjunction with other

methods to achieve a more in-depth research project. Second, faculty and librarians should work together to create opportunities for students to experience serendipity in their research projects. Through these opportunities faculty and librarians can share their own experiences with serendipity and how it can lead to more interesting and informative projects. The more serendipity is talked about the more accepted it will become as part of the research process.

An emphasis on exploratory research methods and preparation for serendipity can occur in the context of writing classrooms in which the professor and the librarian have a significant amount of time to introduce this new disposition towards research. One aspect of the UWP that provides a particularly good context for teaching serendipity in research is the collaboration between writing faculty and librarians. Because librarians and faculty have the opportunity to work together in developing and teaching the course, students have the opportunity to work with two different experts and discover a range of research methods. This interaction is vital for students as they can continuously reflect on and develop what it means to conduct academic research. Another aspect of the faculty/librarian partnership is the emphasis on the recursive nature of writing and research. By emphasizing this recursive process students can experience the ambiguity of research and work through development of a research question. These opportunities provide students with the space and time for serendipitous occurrences to happen. As a result, the first-year writing courses are truly research writing courses and not just a writing course in which students do research.

Second, the thematic writing courses allow students to collaborate with other students and their instructors over a period of time, to familiarize themselves with a new area or discipline and the research strategies associated with it. Within the thematic section, the class can become a mini scholarly community where students learn the valuable tools of networking and collaborating on

research. Because of this context, students can gain a critical disposition towards texts and practice approaching texts rhetorically when they apply the same analysis to research sources and their peers' work. Students can then be positioned not as consumers of information but as co-creators of knowledge.

Finally, the research process can be extended, in stages, over the course of a semester allowing students to try multiple starting points and sort out what it takes to settle on a productive topic. One first-year writing program faculty member who was not part of this study designed his whole course in this manner and spends the first half of the semester working with students to compile a core reading list for a topic that the class chooses to study. Students later repeat that process as they research their individual research projects within the larger topic area.

In conclusion, this article itself resulted from serendipity. The original purpose of the exploratory study was to identify terms that might be interpreted in divergent ways by faculty and librarians and also to understand differences in how faculty and librarians viewed students' research processes. While we hope to publish those results it was the frequent mention of serendipity that caught our attention and led us to further investigate the serendipitous research process. We believe that serendipity plays a key role in the research process of faculty and librarians and have provided examples of how to incorporate serendipity into the research process for students. Further studies on serendipity are needed to further understand how undergraduate students view and incorporate serendipity in their research.

Notes and References

1. Joan M. Reitz, "Serendipity," *Online dictionary for library and information science*. 2007. http://lu.com/odlis/odlis_s.cfm. (accessed July 30, 2009).
2. S. M. Apted, "General Purposive Browsing," *Library Association Record* 73(December 1971): 228.
3. Ibid.
4. Ibid., pp. 230.
5. Daniel Liestman, "Chance in the Midst of Design," *RQ* 31 (Summer 1992): 525. Retrieved from Academic Onefile (accessed June 5, 2009).
6. Liestman defines coincidence as simple randomness or blind luck. Prevenient grace assumes that researchers are led to serendipitous materials through "the cataloging, classification and organization of information" (pp. 526); in other words, through the work of others. Synchronicity contributes to serendipity through "hidden patterns and unknown forces crafting order from chaos." (pp. 528) Liestman refers to Jung's definition of synchronicity which focuses on acausal relationships or events that occur simultaneously but are not dependent on cause and effect.
7. Ibid., pp. 529.
8. Ibid.
9. Ibid.
10. Ibid., pp. 530.
11. Ibid.
12. Ibid., pp. 531.

13. Allen Ford and Nigel Foster, "Serendipity and Information Seeking: An Empirical Study," *Journal of Documentation* 59 (2003): 321-340. Retrieved from ProQuest (accessed June 5, 2009).
14. Ibid., pp. 330.
15. Ibid., pp. 336-337.
16. Elizabeth B. Cooksey, "Too Important to be Left to Chance: Serendipity and the Digital Library," *Science and Technology Libraries* 25 (2004): 23-32. Retrieved from InformaWorld (June 26, 2009).
17. Ibid., pp. 28.
18. Ibid.
19. Ibid., pp. 31.
20. Abigail McBirnie, "Seeking Serendipity: The Paradox of Control," *Aslib Proceedings New Information Perspectives* 60 (2009): 600-618.
21. Jessica George, "Socratic inquiry and the pedagogy of reference," in *Currents and Convergence: Navigating the Rivers of Change: Proceedings of the Twelfth National Conference of the Association of College and Research Libraries*, (Chicago: Association of College and Research Libraries, 2005), p. 381. Retrieved from www.acrl.org/ala/mgrps/divs/acrl/events/pdf/george05.pdf (accessed June 5, 2009).
22. Ibid.
23. Marcia J. Bates, "The design of browsing and berrypicking techniques for the online search interface," *Online Review* 13(1989): 410.
24. Ibid., pp. 409-410.
25. Ibid., pp. 421.

26. David Ellis, "Modeling the information-seeking patterns of academic researchers: A grounded theory approach," *Library Quarterly* 63(1993): 469-486.
27. David Ellis, "A comparison of the information seeking patterns of researchers in the physical and social sciences," *Journal of Documentation* 49 (1993): 360.
28. Ibid., pp. 360-361.
29. Ibid., pp. 361.
30. Ibid., pp. 362.
31. Ibid., pp. 362-363.
32. Ibid., pp. 364.
33. David Ellis, "Ellis's model of information-seeking behavior," in *Theories of information behavior*, edited by Karen E. Fisher, Sandra Erdelez, and Lynne McKechnie (Medford, NJ: Information Today, Inc., 2005), p.140.
34. Sandra Erdelez, "Information encountering: A conceptual framework for accidental information discovery," in *Information seeking in context: Proceedings of an international conference on research in information needs, seeking, and use in different contexts*, (Los Angeles: Taylor Graham, 1997), p. 412.
35. Ibid., pp. 417.
36. Ibid.
37. University Writing Program, "UW20 Template." *First-Year Writing*. 2008.
<http://www.gwu.edu/~uwp/fyw/uw20-template.html> (accessed May 17, 2009).
38. Jack R. Fraenkel and Norman E. Wallen, *How to design and evaluate research in education* (New York: McGraw Hill, 1993), p. 87.

39. Joan M. Reitz, "Browse," *Online dictionary for library and information science*. 2007.
http://lu.com/odlis/odlis_b.cfm. (accessed July 8, 2009).
40. Bates, p. 410.
41. Ibid.
42. Michelle H. Simmons, "Librarians and Disciplinary Discourse Mediators: Using Genre Theory to Move Towards Critical Information Literacy," *portal: Libraries and the Academy* 5 (July 2005): 297-311. Retrieved from Project Muse (accessed June 5, 2009).
43. Ibid., pp. 308.
44. Ibid., pp. 305.
45. Sandra Erdelez, "Information Encountering: It's More than Just Bumping into Information," *Bulletin of the American Society for Information Science* 25 (February/March 1999). Retrieved from <http://www.asis.org/Bulletin/Feb-99/erdelez.html> (accessed June 17, 2009).

Appendix

Participant Information

Participant	Gender	Disciplinary Affiliations	Rank
Faculty 1	Male	History	Assistant Professor
Faculty 2	Female	18 th Century English Literature	Teaching Instructor
Faculty 3	Male	Literature/American studies	Assistant Professor
Faculty 4	Female	English/Women's Studies/Human sciences	Associate Professor
Librarian 1	Male	Political Science/International affairs/Foreign Service	Librarian II
Librarian 2	Female	Art History/Museum studies	Librarian II
Librarian 3	Female	English/Creative Writing	Librarian I