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Towards information fluency: applying a different model to an information literacy credit course

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Keywords

information fluency, information literacy, critical thinking, computer literacy, library instruction

Paper category

Case Study

Structured abstract

Purpose

This article examines information literacy, critical thinking, and computer literacy in higher education and discusses the application of the information fluency model, created by the Associated Colleges of the South, to the Purdue University Libraries one-credit information literacy course, GS 175 Information Strategies.

Design/methodology/approach

The case study has a two-part focus. The first examines information literacy, critical thinking, and computer literacy in higher education through a review of the literature. The second part discusses the pilot GS 175 Information Strategies course, shows how the information fluency model was applied, and analyzes the overall success of the pilot.

Findings

Today, employers and professors expect graduates and students to exhibit critical thinking, analysis, research, and technology skills at a fairly high level. Universities are responding with a more rapid integration and adoption of technology and creating a higher emphasis on information use and retrieval. Increasingly, student research projects are being displayed, presented, and contained in a variety of formats. Library instruction programs and courses need to evolve and adapt to these changes as shown through the successful modification of the GS 175 Information Strategies course.

Practical implications

The article provides ideas and concepts for enhancing the critical thinking and technology components of an information literacy course or program as well as touches on what to avoid when modifying assignments and projects.

Originality/value

The application of the information fluency model is a fairly new model to the library profession. This case study shows one way information literacy credit courses can be modified to accommodate the changing educational landscape and the expectations of Generation Y. It can

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be used by instruction librarians and their faculty partners to explore alternatives to their current instructional programs.

Introduction

As more and more employers and professors start requiring students to have higher levels of critical thinking, analysis, research, and technology skills, universities, to stay competitive in current and future markets, are responding by implementing a more rapid integration and adoption of technology as well as creating higher emphasis on the uses and retrieval of information. Additionally, student projects are being displayed, presented, and contained in a variety of formats. With the increased access to technology and information, discussion and debate about critical thinking in higher education has emerged once again. Faculty, librarians, and students all struggle with effective integration of information literacy, critical thinking, and technology into the research process and system-wide curricula.

In recent years, several instruction models have been developed to address this issue. Library-sponsored credit courses offer instruction librarians the opportunity to explore and create models for a blending of information literacy, critical thinking, and technology. One such model being applied to a one-credit information literacy course, GS 175 Information Strategies, at Purdue University is called the information fluency model. This concept and model surfaced about eight years ago from the Associated Colleges of the South to address the ever increasing instructional challenges facing librarians, students, and professors within the university environment. The pilot was conducted during the 2005 Spring semester and tested how effectively technology and critical thinking could be integrated into the class assignments and final project.

Overview of the information literacy course

In the mid-nineties Purdue librarians saw the need for establishing a credit course that focused on the foundations of library research. The first one-credit course was developed in partnership with the Electrical Engineering Technology program as a required course. This class quickly evolved into multiple sections and was opened to all undergraduate students. Librarians across the system taught the various sections of the course. Because this class had become a stable and consistently offered course, it was chosen for a pilot to test the application of the information fluency model.

The information fluency model was selected because it supports blending information literacy, critical thinking, and technology into curriculum. Since this model is relatively new to most librarians and faculty at Purdue, it was necessary to identify potential partners for this endeavor. The partner chosen for this initiative was the Digital Learning Collaboratory (DLC); a program and facility at Purdue University that supports the concept of information fluency and enhances the current instructional initiatives of the Libraries. By exposing students to high-end, multimedia equipment and applications, this program encourages creative utilization of these resources for research and classroom projects. The DLC provided teaching space and support through its hardware, software, and student assistants.

The course took place during the last eight weeks of the semester and met twice a week for fifty minutes. The class followed the standard course structure with weekly homework assignments and a larger final project. The syllabus was divided into three distinct areas: types of information and topic exploration, finding and evaluating information, and constructing the final project. During class sessions, group and hands-on activities were used in conjunction with class lectures. The *Comprehensive Online Research Education* (CORE; <http://core.lib.purdue.edu>)

online tutorial, which is sponsored and maintained by the Libraries, was used for homework reading assignments. For the final project the students needed to create a three minute, self-running multimedia presentation about a current or hot topic.

Since the class was open to all undergraduate students, the makeup of the class was quite diverse. The year statuses ranged from second semester freshman to last semester seniors. The declared majors also contributed to the diversity of the class; they included Education, Engineering, Technology, Management, and Liberal Arts. Due to the wide range of years and majors, duplication of concepts and topics were inevitable. However, the main components of the class were created with the assumption that most students were not familiar with the content. The students were allowed to pick their own topic for the final assignment, which helped accommodate the variety of student backgrounds and interests.

The librarian, who created and taught the course, regularly works with faculty across the campus helping them integrate information literacy and technology into their courses. It was a logical and natural fit for this individual to spearhead the pilot. While support from the Libraries administration was strong, continued support and integration of the course as a permanently offered section relied on the pilot's overall success. Due to the uniqueness of the concept, the thoughtful design of the course syllabus, relevance to already established standards, and exploration of the scholarly literature, this was fully expected.

Information literacy, critical thinking, and technology in higher education

The evolution of this pilot course was strongly grounded in the scholarly literature that has appeared over the last several years. Research related to the three main concepts of the information fluency model come from three distinct schools of scholarship. Research into these

areas proved essential in getting a better and broader picture on the influences of each on higher education and ultimately library instruction. Understanding of key documents and contributions to information literacy, critical thinking, and technology in higher education shaped the direction and development of the overall class.

Faculty, librarians, university administrators, professional organizations, and even government committees continue to determine and shape what constitutes critical thinking, information literacy, and computer literacy within higher education. Several publications and web sites are available to guide interested parties in incorporating all of these components into their courses. There are three sources that stand out as key elements for each; they are:

Information Literacy Competency Standards for Higher Education

(<http://www.ala.org/ala/acrl/acrlstandards/informationliteracycompetency.htm>) by the

Association of College and Research Libraries (ACRL), *Being Fluent with Information*

Technology (<http://books.nap.edu/html/beingfluent/>), a report developed and published by the

Committee on Information Technology Literacy of the National Research Council, and *The*

Critical Thinking Community (<http://www.criticalthinking.org/>), a web site maintained by the

Foundation for Critical Thinking. Each publication provides goals, outcomes, and standards that can be applied and incorporated into curricula.

While each set of standards have commonalities, each school of thought remains separate. In the Information Literacy and Information Technology section of the ACRL standards document it clearly states, “information literacy initiates, sustains and extends life long learning through abilities which may use technologies but are ultimately independent of them” (Association of College and Research Libraries, 2000, p. 4). The Committee on Information Technology Literacy report (1999) indicates that “information technology is a medium that permits the

expression of a vast amount of information, ideas, concepts, and messages” (p. 15). Reffell and Whitworth (2002) support this further by stating that information technology supports students by giving them higher or greater output and providing a gateway to spheres of information. In their study “Differentiating Information Skills and Computer Skills,” Pask and Saunders (2004) conclude that these skills are distinctly different from each other but both are important components of a student’s college education. Critical thinking is an ever present component of higher education. Many view critical thinking as a mode of thought which is “self-directed, self-disciplined, self-monitored, and self-corrective” (Thinking, 2004a, para 5) but not dependent on technology and while showing a closer link to information literacy, critical thinking is separate from it.

In ACRL’s (2000) *Information Literacy Competency Standards for Higher Education*, information literacy is defined as a set of skills or abilities when looking for and evaluating information that can be used through one’s entire life; the standards are meant to evaluate and assess one’s level of information literacy. Eisenberg, Lowe, & Spitzer (2004) promote information literacy as a process and a change in thinking rather than a set of skills; to achieve this, information literacy must be integrated across an institution’s curriculum. Integration of information literacy into curricula varies across campuses. Some programs rely heavily on the guest lecture format, others work at the program or system curriculum level, still yet others have credit courses. More often than not all of these approaches are used in library instruction programs.

Some may argue information literacy develops critical thinking and therefore, it shouldn’t be identified as a separate component within the information fluency model. It is important to remember that information literacy is not just critical thinking. The ACRL standards have

intertwined components of critical thinking but it is not implicitly stated as a standard in of itself. With the study of critical thinking coming out of the cognitive sciences and philosophy circles, researchers argue that it can be taught independent of specific disciplines as well as embedded within them (Moore, 2004). Students can gain critical thinking in many ways. For instance, a student can think critically when playing a game of chess or solving a math problem.

As greater amounts of information become widely available professors and librarians need to find ways and take time to incorporate critical thinking into their courses (Grimes and Boening, 2001). The Foundation of Critical Thinking (2004a) states that a critical thinker consciously applies thought skills to the issue or information at hand with the goal of elevating his or her ability to comprehend, synthesize, and solve. Whether or not students overtly apply critical thinking to all aspects of their academic careers, a main goal of colleges and universities is to help students build skills for drawing clear conclusions derived from the information encountered, with well defined values, and through logic (Randall and Grady, 1998). All areas of study should introduce students to thinking mechanisms and develop their ability to use them for course content, career, and life in general (Clarke and Biddle, 1993).

Even though critical thinking has been a mainstay in higher education for several decades, research shows that faculty still struggle with its effective integration into their curriculum (Gellin, 2003). Because there is debate about the exact definition of critical thinking and whether or not it should be taught as an independent course or within a subject area, this creates barriers to its effective integration into university curriculum and even one's ability to accurately assess students' aptitude to be critical thinkers (Moore, 2004). However, critical thinking can be assessed by examining a student's "cognitive thinking skills, motivational dispositions, behavior habits, and ideological beliefs" (Cheung et al., 2002, p.505). There is growing support that active

learning exercises and assignments, such as journaling, service learning, group projects, and case studies, help increase students' critical thinking (Burback et al., 2004).

Not many people refute the impact the last 25 years of technological advancements have had on universities. Whether or not the influx of technology is fully embraced by faculty and librarians, it is here to stay and will continue to influence efforts in the classroom. Shields (2000) states "that the traditional model of campus-based teaching, learning, and scholarship must adapt to new technological realities or die" (p. 162). While advancing technologies are viewed by some as the demise of traditional college teaching, the struggle for faculty to adopt technology is often the lack of institutional support both for the technology and the pedagogy that should accompany its integration (Bates and Poole, 2003). Incorporating technology into a course or project varies as much as the content of the class.

What is defined or demonstrated as computer literacy within higher education varies according to the type of organization supporting the incorporation of it. The commonality between many of these organizations is that computer literacy is based on tasks and skills. The Free On-Line Dictionary of Computing (1998; <http://foldoc.doc.ic.ac.uk/>) defines computer literacy as having the basic skill to use computers, which is needed to function in society. With today's rapid changes in technology, basic skills often fall short and often do not allow individuals to function effectively. Higher level skills are really necessary to function in today's society and institutions of higher education share the responsibility of integrating these skills to the curriculum (National Research Council, Committee on Information Technology Literacy, 1999). However, the basic skills are needed to create a stable foundation to move to the higher level skills.

As research libraries stay apprised of ongoing trends within higher education, so must instruction librarians. Using technology, applying critical thinking, and accessing multiple information sources within the classroom are now the expectation rather than the exception. Library credit courses are an excellent test bed for creating and using models that apply all or portions of these concepts and skills.

Incorporation of information literacy, critical thinking and technology can be a challenge and several barriers exist. Determining the appropriate type of technology is greatly dependent on the learning outcomes of the project and course; the technology should enhance the learning experience of the students and support the outcomes, not overpower. Students upon arriving to college are expected to already be critical thinkers but this can never be assumed. With large amounts of information easily reached through web search engines, students come to classes thinking they are information literate. Utilizing the information fluency model helps professors and librarians overcome these barriers and encompass the three elements of critical thinking, information literacy, and technology.

The Associated Colleges of the South (ACS) created this new model to represent an individual who can function with relative ease in this world of ever increasing information and changing technologies. Called the information fluency model, it “may be envisioned as the optimal outcome when critical thinking skills are combined with information literacy and relevant computing skills” (Associated Colleges of the South, 2003, para 4). An overall goal of the organization is bringing together librarians, faculty, and IT staff to collaborate and develop initiatives, which address the impact changes in information and technology have in higher education.

Other interpretations of information fluency are present in library literature. Zhang (2002) comments that “the purpose of information fluency is to develop the critical thinking and information literacy skills of students through effective use of technologies” (p. 358). Rader (2004) indicates that “information fluency can be defined as the ability to navigate information structures and to evaluate information retrieved through these information structures” (p. 75) and incorporates multiple literacies as well as critical thinking. As with the ACS definition, critical thinking, information literacy, and technology are all important components of both definitions. With these definitions and model structure in mind the pilot course was developed.

Applying the information fluency model

After gaining a broad perspective for the ongoing trends and challenges related to information literacy, critical thinking, and technology in higher education, the next step was to take those theories and ideas and apply them to the existing course structure. Examination of the course objectives, homework assignments, and final project were necessary. This process identified components of the course that needed to be modified or completely changed. The examination revealed that new objectives would need to be created, some homework assignments modified, and a new final project developed. By applying these changes the key elements of information literacy, critical thinking, and computer literacy would be addressed. In some instances these elements were addressed individually but the ultimate goal was to blend them into all aspects of the course.

As Generation Y enrolls into colleges they bring with them a new set of expectations about what is an effective instructional environment with a propensity towards active learning (Manuel, 2002). The GS 175 class activities and homework assignments, geared towards

building the students skills in finding and evaluating information sources, employed active learning techniques. This approach helped students build on and reinforce what was learned throughout the course and kept them interested and engaged. Even though skill building was present, the overarching focus was on the processes that employed information literacy, critical thinking, and computer literacy.

Developing the course objectives

Even though the concepts and skills of critical thinking, research strategies, and evaluation continue to be key learning outcomes for most instructional initiatives, specific learning objectives can be adjusted for the changing information environment (Warnken, 2004). The learning outcomes for the Information Strategies course are grounded in the ACRL Information Literacy Standards yet enable each librarian teaching the course to establish specific objectives for the section he or she is teaching. The overall outcomes state that after the course each student will be able to:

- explain how information is organized and disseminated
- define [his or her] own information needs and develop an efficient plan to retrieve it
- use relevant resources to identify needed information
- evaluate and select information
- organize, synthesize and share information (Purdue University Libraries, 1998, para 2)

Building off of the system-wide outcomes, tailored goals and objectives were developed to accommodate the critical thinking and technology aspects of the pilot. The overall goal for the course is stated as “students will find, examine, and synthesize information about a current or hot topic using a variety of research and multimedia tools” (Sharkey, 2005, para 2). The learning objectives created for the pilot course reflect the added emphasis on critical analysis and technology. Once completing the course, the students were expected to achieve the following:

- differentiate between types of information using the key elements provided during the in-class group activities

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- write a thesis statement for the final project using the main criteria provided by the thesis statement worksheet
- find a variety of sources related to the selected current or hot topic using two or more research tools
- determine the relevance of a found source by writing a short critical analysis about that source
- convey the thesis statement with the found sources through a self-running multimedia presentation (Sharkey, 2005a, para 3)

These objectives were addressed at various points throughout the eight-week course; each building off of the previous one and attempting to blend all three concepts of the information fluency model simultaneously.

Addressing Information Literacy

The basis of the class is grounded in information literacy. The specific ACRL (2000) standards and performance indicators targeted in the course were:

- Standard 1 - The information literate student determines the nature and extent of the information needed.
 - Performance indicator 2 - The information literacy student identifies a variety of types and formats of potential sources for information.
- Standard 2 - The information literate student accesses needed information effectively and efficiently.
- Standard 3 - The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.
 - Performance indicator 1 - The information literate student summarizes the main ideas to be extracted from the information gathered.
 - Performance indicator 3 - The information literate student synthesizes main ideas to construct new concepts.
- Standard 4 - The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.
 - Performance indicator 1 - The information literate student applies new and prior information to the planning and creation of a particular product or performance.

The first part of the course focused on identification of information types and topic exploration. During this time, students explored various types of information and discussed in small and large groups the relevance and importance of each type. Readings from the online

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tutorial, CORE, and class discussions introduced students to effective search strategies.

Additionally, the students examined the research tools that were gateways to potential sources. In specific assignments and in-class activities they compared and contrasted online tools such as article databases, web search engines, and digital image repositories.

To create a foundation in support of the identified ACRL standards, the students' homework assignments were to read and complete quizzes of the various modules from the CORE (<http://core.lib.purdue.edu>) online tutorial. This tutorial presents the various aspects of information literacy, like search techniques and source evaluation criteria, in a set of ten modules. The modular setup of the tutorial allows for individuals to use it as a point of need resource or for professors to integrate all or portions of the tutorial into a course. While the majority of the modules were used for this class, the order in which they were used didn't reflect the order presented via the tutorial interface. The modules were assigned in conjunction with the various lecture topics and in-class activities. The progression of the modules was: Types of Information, Internet, Topic Exploration, Evaluating Information Sources, Search Basics, Types of Searches, Keyword Searching, Libraries Catalog, and Indexes. The classes after the readings and quizzes, focused on the concepts from each module. Each class typically consisted of a brief lecture, a large group discussion and an in-class activity. The presentation of the information in this order was meant to build toward the creation of the final project.

To help the students get a sense of the scope of potential information sources, one of the first in-class activities had the students work in pairs and discuss whether or not particular objects were information. Each pair was given a short list of questions to help facilitate their discussion. The types of objects ranged from traditional information sources like a book or encyclopedia to non-traditional sources such as a digital image or song. Not surprisingly most of the students

didn't consider the non-traditional sources as information. This initiated a large group discussion about what is information, when certain types of information are appropriate to use and how to make that distinction. This helped set the stage for a focused look at potential sources for their final projects.

Once students selected a topic, they completed two homework assignments that focused on topic exploration. The first assignment was creating a concept map. For this assignment each student needed to identify at least three sub-categories off of their main topic and then additional categories off of those to create three tiers within the concept map. The second assignment had the students write their thesis statements. They filled out a worksheet which provided general guidelines for creating a thesis statement and additional web sources for them to consult. In addition to writing a statement, the students were asked to provide potential types of information they could use for the project. This was done to reinforce previous discussion and to help the students begin to form a general plan for finding information about their topic.

After a session about effective search strategies, four consecutive classes covered specific research tools available via the World Wide Web. This began the second main section of the syllabus. At the beginning of each class, the students were given the names of specific tools with a set of questions. They worked in groups of three or four to explore the various aspects of the tools such as the type of information found within the source and the searching capabilities of the interface. Each group reported back to the entire class through demonstration of the tool as well as identification of one distinct feature that differed from other sources evaluated. The research tools explored were the Libraries Catalog, ProQuest Research Library, Academic Search Elite, Health Source - Nursing Edition, Omni Full Text Mega, Dogpile, HotBot, Alta Vista, Lycos, About.com, AP Multimedia Archive, and singingfish.com. These tools were selected because

they housed or provided access to the types of sources needed for the final project. Google and Yahoo were not used for these activities due to the students' familiarity with those tools. The use of the exploration / demonstration activities enabled the students to access relevant tools prior to the source-finding homework assignments and to help them begin thinking critically about relevant information sources.

Addressing Critical Thinking

The Critical Thinking Community (2004b) contends that we can quite easily live life without examining the world around us. This can be done by taking everything at face value, being passive or impulsive in our actions, or allowing others to unduly influence our behavior. Therefore to break out of this pattern, critical thinking should become a "practical goal and value," (para 17) since it is at the core of a complete and prolific life. It is important to note that a student's psychological development will impact his or her ability to critically analyze information (Gatten, 2004). Even though, individuals develop psychosocially at different times in their lives, this does not mean critical thinking concepts and activities cannot be included in a general way. Specific courses and assignments utilizing library sources as well as library instruction can promote and strengthen critical thinking (Bodi, 1988). Building off of traditional library instruction, focusing first on critical thinking shifts instruction to become learner-centered by helping students figure out what to do with the information they find instead of just teaching search strategies skills (Atton, 1994, Wesley, 1991).

Several techniques were used throughout the course to help students build their critical thinking skills. The students' first homework assignment was to write a reaction essay to the statement "Information is a commodity and knowledge is power." The purpose of this assignment was two-fold; the first purpose was to get a sample of the students writing so it could

be compared with future writing assignments and secondly to get a sense of each students' thought process regarding information and its connection to their lives and the community at large as well as determining their level of critical thought. The resulting essays revealed that most of the students relied on a dictionary definition to form an opinion about what is information and knowledge. They also showed a disconnect between their individual, personal information needs to that of course projects. Most of the discussions focused on the idea of information as part of a formal process such as writing a paper or completing a group project. Only a few students discussed how information affects and influences them personally or demonstrated conscience, critical thought.

In conjunction with the in-class exploration of research tools, the students were required to use those tools to find potential information sources for their final project. For each source found, they wrote a one to two paragraph analysis about the source. Since the final project required them to use multiple information sources, these homework assignments provided a structure to help the students fulfill that aspect successfully. The analysis of each source was intended to reflect a similar outcome to the traditional annotated bibliography, so students would find and use quality sources. The students were required to explain why and how each source supported and contributed to their thesis statement and presentation.

Every class period included the use of the Socratic Method to initiate discussion about the concepts being learned and taught. One key discussion that occurred was about copyright and plagiarism. The in-class activity took practical examples of each and built into a broader discussion about these concepts and why it is important to aware of them.

For the copyright discussion the students were presented with two examples; one example was about writing an article for the student newspaper and the other was about creating an audio

recording of a speech. Both instances were representations of copyright violation; however, the students did not recognize them as such and in a couple of instances showed shock and dismay.

During the plagiarism discussion, the students were provided examples of plagiarism and non-plagiarism. The students were asked to identify which examples were or weren't plagiarism. Many of the students were not able to identify which examples demonstrated plagiarism and which demonstrated correct paraphrasing and citation. Most of the students indicated they were never taught or don't remember being taught how to distinguish the differences between correct paraphrasing and copying and pasting text directly from a source. Concluding components of both discussions was to help the students identify and think about why these issues were important to them personally as well as the larger world of information.

Addressing Computer Literacy

There can be many challenges to successful integration of technology within a course or project. The place for technology in the classroom is still under debate; the arguments range from the idea that technology takes away the control of the classroom from professors and teachers to the belief that technology changes too quickly to effectively incorporate it into the curriculum (Bates and Poole, 2003). However, when basing the use of technology in the classroom on an engaged learning environment, its potential use and application expands greatly. Just using technology doesn't guarantee students will work together or even create a collaborative learning environment; technology needs to be incorporated for specific scenarios and activities (Pappas et al., 1998, Donaldson and Knupfer, 2002). Often the focus of technology integration in the classroom or curriculum is viewed as using computer hardware and software, course management tools, or the Internet. With the advancements in digital technology, the types of tools and resources available for incorporation into curriculum have increased significantly.

Computer literacy in this class was addressed primarily through the final project. Even though the students used online resources such as article databases and web search engines that in itself does not constitute technology integration. The final project required the students to create a self-running multimedia presentation about a current or hot topic. The variety of sources they found and analyzed throughout the course provided the base content for their presentation. The overall presentation needed to support or refute the thesis statement developed earlier.

For creating the multimedia project, students were given a choice to use whatever application they felt comfortable using. An informal show of hands from the students showed that none of them had used a film editing application or created any type of multimedia presentation. PowerPoint, Windows Movie Maker, and Apple's iMovie were strongly suggested because the students needed a shorter learning curve to use them successfully. The final project was entirely new ground for all of them. Most of the students felt they could achieve the project goal given the right guidance and support. Two class sessions provided an introduction to Windows Movie Maker and advanced PowerPoint. The Digital Learning Collaboratory student assistances provided support during non-class times.

The nature of topics chosen by the students varied as much as the demographics of the class. Some of the students focused on typical hot topics like steroid use in baseball, animal welfare, the Terri Shiavo case, and Alzheimer's disease. Where as others explored the plight of the family farm, reality TV shows influence on the fashion industry, and reconstruction of the coliseum in Rome. All of the topics chosen by the students provided a wide variety of print sources as well as nontraditional sources such as audio news, digital images, and video clips.

The syllabus provided an explanation of the project so students had a guide as to what was expected of them. Throughout the eight weeks, the project expectations were discussed as well as

continued reinforcement that the various homework assignments were in place to help them with the final project. The syllabus explained the basic project requirements as:

You are to create a 3 minute multimedia presentation covering a current or hot topic (if you can, choose a topic or issue to which you have a personal connection). The presentation must clearly and concisely discuss the topic and include viable sources from which you gathered your information. Key components:

- You must use a variety of sources including but not limited to books, articles, government documents, music, images, video, and personal narrative, images, and/or video.
- The sources used must be cited using MLA or APA and included as part of the presentation.
- The presentation must be handed in on a CD or DVD.
- You must include with the presentation a reflection piece about the project and your experiences with it. (Sharkey, 2005b, para 4)

A set number of required source types was not implemented due to the variety of topics and to give students the flexibility in how they would present their information.

The overall project was worth forty points. Each criterion represented a specific number of points; for instance, using correct citation formatting equaled ten points. The projects were graded using the following criteria: a clearly stated thesis statement, utilizing a variety of sources, using quality sources, using sources relevant to the topic, maintaining a clear focus on the thesis statement, correctly citing the sources, handing in the presentation on a CD or DVD, and writing a reflective paper. Failure to incorporate all or part of the criteria resulted in points being lost. Most of the students who lost points relied on mostly one type of information source or did not cite sources appropriately. The students were not graded on the overall aesthetics of their presentations due to the fact that the presentations were created in a variety of formats and it was felt that too much subjectivity would enter into the grading process.

Analysis of success

The overall class can be viewed as a success. All of the students completed the final assignment with minimal complaints of the project being too much work or inappropriate for this type of class. Some students commented that they spent more time on this project than any other project they had for that semester. In the course evaluations many students indicated that they had learned several things about finding information and using technology because they weren't previously aware of these options. However, as with all new courses, there are modifications that need to be made.

As the course progressed it became apparent that changes would need to occur with several of the homework assignments. Some assumptions were made about the students' knowledge of writing analyses of sources. After several assignments, it was apparent that the students didn't quite understand what it meant to fully analyze a source even though class time was spent discussing this. Not surprising, the students were also reluctant to do more than what was stated in the homework descriptions. What students wrote that did not constitute an effective analysis of a source ranged from one sentence statements like "this article is useful because it is about my topic" to copying and pasting the entire abstract. Only one student consistently wrote a substantial synthesis of what each source was about and clearly identified how and why the information would be used in the final project. To encourage in-depth analyses, more class time should be spent on the concept of critical thinking and what writing a source analysis entails. The homework assignments can be rewritten to clarify expectations such as stating specific elements that have to be present in each analysis.

Even though the final project expectations and requirements were discussed in many of the class sessions and the students had a sample project to examine, many still missed the mark. Most of the students chose to use PowerPoint as the multimedia application for the final project

because of familiarity with the software. The students found it difficult to move beyond the mind set of a standard PowerPoint presentation, even despite the final assignment requiring them to include content of substance in addition to the audio, video, and still images. As a result there was heavy reliance on bulleted lists resulting in concepts about the chosen topic getting watered down. The students also struggled with the three minute time limit; many felt that was not enough time to effectively cover a topic. Here again, rewording the assignment by removing the word presentation and stating that the final project is to be a critical analysis of the topic will help the students move beyond the habit of presenting information as a bulleted list. Also, removing the option to use PowerPoint and only allowing use of a film editing application will force the students to conceive the project as a short film rather than a traditional electronic presentation.

Lastly, to create a sense of conclusion and celebration of the students' hard work, class time should be reserved for viewing the clips created by the students. The last two class periods could easily serve this purpose. To support class participation during this time, a peer review process could be established by the students themselves. This would also create buy-in and a commitment to creating a quality product. The peer reviews could be used as part of the overall grade for the final project.

Conclusion

Technology will continue to affect our lives and each new generation of students will come to universities and colleges with certain expectations for accessing hardware, software, and information. However appropriate integration of technology needs to be supported by strong learning objectives that maintain a focus on information literacy and critical thinking. Programs

and facilities can evolve and adapt to the needs and expectations of both students and faculty as well as fulfill accreditation requirements, support professional standards, realize university mission statements, and address employer expectations. Utilization of models like the information fluency model from the Associated Colleges of the South ensures all groups will enhance curriculum and develop unique research projects that support the key elements of the model. The pilot of the one-credit course, GS 175 Information Strategies, shows that each of these concepts can be integrated successfully using this model as well as creating specific learning outcomes to address information literacy, critical thinking, and computer literacy.

References

- Associated Colleges of the South (2003), *ACS information fluency - definition* [Internet], Available from: <http://www.colleges.org/~if/if_definition.html> [Accessed September 29 2004].
- Association of College and Research Libraries (2000), *Information literacy competency standards for higher education*, American Library Association, Chicago, IL.
- Atton, C. (1994), "Using critical thinking as a basis for library user education", *The Journal of Academic Librarianship*, vol. 20 no. 5/6, pp. 310-313.
- Bates, A. W. & Poole, G. (2003), *Effective teaching with technology in higher education: Foundations of success*, Jossey-Bass, San Francisco, CA.
- Bodi, S. (1988), "Critical thinking and bibliographic instruction: The relationship", *The Journal of Academic Librarianship*, vol. 14 no. 3, pp. 150-153.
- Burback, M. E., Matkin, G. S. & Fritz, S. M. (2004), "Teaching critical thinking in an introductory leadership course utilizing active learning strategies: A confirmatory study", *College Student Journal*, vol. 38 no. 3, pp. 482-493.
- Cheung, C.-K., Rudowicz, E., Kwan, A. S. F. & Yue, X. D. (2002), "Assessing university students' general and specific critical thinking", *College Student Journal*, vol. 36 no. 4, pp. 504-525.
- Clarke, J. H. & Biddle, A. W. (eds.) (1993), *Teaching critical thinking: Reports from across the curriculum*, Prentice Hall, Englewoods Cliffs, NJ.
- Donaldson, J. A. & Knupfer, N. N. (2002), "Education, learning, and technology" in Rogers, P. L. (ed.), *Designing instruction for technology-enhanced learning*, Idea Group Publishing, Hershey, PA, pp. 19-54.
- Eisenberg, M. B., Lowe, C. A. & Spitzer, K. L. (2004), *Information literacy: Essential skills for the information age*, Libraries Unlimited, Westport, CT.

- Foundation for Critical Thinking (2004a), *Defining critical thinking - the critical thinking community* [Internet], Available from:
<<http://www.criticalthinking.org/aboutCT/definingCT.shtml>> [Accessed May 18 2005].
- Foundation for Critical Thinking (2004b), *Our concept of critical thinking - the critical thinking community* [Internet], Available from:
<<http://www.criticalthinking.org/aboutCT/ourConceptCT.shtml>> [Accessed May 18 2005].
- Free On-Line Dictionary of Computing (1998), *Computer literacy* [Internet], Available from:
<<http://foldoc.doc.ic.ac.uk/foldoc/foldoc.cgi?computer+literacy>> [Accessed July 29 2005].
- Gatten, J. N. (2004), "Student psychosocial and cognitive development: Theory to practice in academic libraries", *Reference Services Review*, vol. 32 no. 2, pp. 157-163.
- Gellin, A. (2003), "The effect of undergraduate student involvement on critical thinking: A meta-analysis of the literature 1991-2000", *Journal of College Student Development*, vol. 44 no. 6, pp. 746-762.
- Grimes, D. J. & Boening, C. H. (2001), "Worries with the web: A look at student use of web resources", *College and Research Libraries*, vol. 62 no. 1, pp. 11-22.
- Manuel, K. (2002), "Teaching information literacy to generation Y" in Durisin, P. (ed.), *Information literacy programs successes and challenges*, Haworth Press, New York, NY, pp. 195-217.
- Moore, T. (2004), "The critical thinking debate: How general are general thinking skills?" *Higher Education Research & Development*, vol. 23 no. 1, pp. 3-18.
- National Research Council, Committee on Information Technology Literacy (1999), *Being fluent with information technology*, National Academy Press, Washington, D.C.
- Pappas, V. C., Krothe, J. S. & Adair, L. P. (1998), "Using collaborative work technology to support active learning", *Journal of Research on Computing in Education*, vol. 31 no. 1, pp. 49-61.
- Pask, J. M. & Saunders, E. S. (2004), "Differentiating information skills and computer skills: A factor analytic approach", *portal: Libraries and the Academy*, vol. 4 no. 1, pp. 61-73.
- Purdue University Libraries (1998), *GS 175: Information strategies* [Internet], Available from:
<<http://www.lib.purdue.edu/rguides/gsl75/>> [Accessed January 31 2005].
- Rader, H. B. (2004), "Building faculty-librarian partnerships to prepare students for information fluency: The time for sharing information expertise is now", *College & Research Libraries News*, vol. 65 no. 2, pp. 74-6, 80, 83, 90.
- Randall, K. & Grady, D. L. (1998), "The greek experience and critical-thinking skills", *New Directions for Student Services*, 81, pp. 29-37.
- Reffell, P. & Whitworth, A. (2002) "Information fluency: Critically examining IT education", *New Library World*, no. 1182/1283, pp. 427-435.
- Sharkey, J. (2005a), *GS 175 information strategies* [Internet], Available from:
<<http://web.purdue.edu/~sharkeyj/gsl75pilot/>> [Accessed May 10 2005].
- Sharkey, J. (2005b), "Homework & assignments" *GS 175 information strategies* [Internet], Available from: <<http://web.purdue.edu/~sharkeyj/gsl75pilot/assignments.html>> [Accessed May 10 2005].
- Sheilds, M. A. (2000), "Technological change, virtual learning, and higher education" in Garson, G. D. (ed.), *Social dimensions of information technology: Issues for the new millennium*, Ideas Group Publishing, Hershey, PA, pp. 160-176.

- Warnken, P. (2004), "The impact of technology on information literacy education in libraries", *The Journal of Academic Librarianship*, vol. 30 no. 2, pp. 151–156.
- Wesley, T. (1991), "Teaching library research: Are we preparing students for effective information use?" *Emergency Librarian*, vol. 18 no. 3, pp. 23-29.
- Zhang, W. (2002), "Developing web-enhanced learning for information fluency", *Reference & User Services Quarterly*, vol. 41 no. 4, pp. 356-363.