FROM PRE-DEFINED TOPICS TO RESEARCH QUESTIONS: AN INQUIRY-BASED APPROACH TO KNOWLEDGE

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INTRODUCTION

First-year undergraduate students, often designated as the Millennials, are the first generation to have grown up with a household computer. They are adept at using technology in their everyday life and are heavy multi-taskers. They believe they can simultaneously attend to text messages, listen to music, and type an assignment. Unfortunately, this practice has impacted their attention span inside the classroom. In order to prevent boredom and inattention, today's information literacy librarian needs to use active learning techniques such as the Cephalonian Method or clicker response systems to engage students in the learning process during a library instruction session. In addition, the benefits of using inquiry-guided learning techniques which encourage problem solving and student-centered constructivism are discussed.

BACKGROUND

In 1949, the American linguist, Zipf, commented that with regard to information literacy, "least effort tends to be the norm" (as cited by Hepworth & Walton, 2009, p.80). The problem of students wanting to expend minimal effort to complete assignments is observed at the University library reference desk, when students comment that they have completed a paper and only need one or two more articles for their reference list. The structure of the traditional research approach appears to contribute to this type of intellectual apathy.

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In this traditional model, students are assigned research topics or they are permitted to choose a research topic on their own with very little attention given to which topic to choose. This sets the stage for a lack of consideration in terms of discovering what they really want to learn or are curious about in their everyday world. Next they read books, encyclopedia articles, or possibly journal articles, and then "regurgitate the information" (Hepworth & Walton, 2009, p.9) in a report without taking a focused interest in their topic. Since, in this traditional model, their focus is not problem-based, they do not think deeply or critically about what they read, and are not evaluating or analyzing the information to assimilate it with their own knowledge and gain new knowledge.

Throughout history, there have been many prominent philosophers and educators who have influenced inquiry-based learning. Socrates, the father of the Socratic Method used a series of questions to lead to investigation. Often the answer to one question was the basis for the next one. This process allowed individuals or a group to form their view or opinion on a topic, by thinking critically about the issues. John Dewey, an American educator and philosopher wanted to change education by making it student-centered. He advocated for children to have a natural experience of discovery and wonder about the world around them, and elevated inquiry to a form of intelligence (Dewey, 1948).

The National Commission on Educating Undergraduates in the Research University (also known as the Boyer Commission) was formed in 1995 to address undergraduate education in research universities. The Boyer Commission Report of 1998 offered ten recommendations on how to improve undergraduate education, including making research-based learning the standard; encouraging that learning be guided discovery rather than the simple transmission of information; having "real" faculty

teaching undergraduate classes; and having students engage in research from the very beginning, essentially advocating for an inquiry-based freshman year. A key idea was reciprocity, where students and faculty would work collaboratively and learn from each other in the process (Boyer Commission on Educating Undergraduates in the Research University, 1998). The report also created an Academic Bill of Rights which included that students be given "opportunities to learn through inquiry rather than the simple transmission of knowledge" (Boyer Commission on Educating Undergraduates in the Research University, 1998, p. 12), and that the "research university must facilitate inquiry in many different places and contexts around campus, including the library" (Boyer Commission on Educating Undergraduates in the Research University, 1998, p.13).

CURRENT PRACTICE

The current literature suggests that a traditional "pre-defined topic" type of approach does not encourage engagement and enthusiasm for learning. For this reason, Michigan State University librarians Michelle Allen and Benjamin Oberdick and other members of the library instruction team have adopted inquiry-guided learning. Inquiry-guided learning "refers to a range of strategies used to promote learning through students' active, and increasingly independent, investigation of questions, problems and issues, often for which there is no single answer" (Lee, Greene, Odom, Schechter, & Slatta, 2004, p.5). Inquiry-guided learning can be used with a range of instruction strategies/approaches, including interactive lectures, group discussions, problem-based learning, case studies, simulations or almost any other approach except traditional lecturing. While traditional learning focuses on learning content, inquiry-guide learning focuses on investigating a problem in which there may be no clear cut answer or one which may lead to another series of questions. In inquiry-guided learning, teachers often act as facilitators and assist students in mastering and learning through their active engagement (Lee, Greene, Odom, Schechter, & Slatta, 2004).

Part of the reason Michigan State University instruction librarians have embraced inquiry-guided learning is because the Tier I Writing program for first-year students focuses on inquiry-based learning in its goals and outcomes (Michigan State University, n.d.). Tier I Writing faculty schedule an instruction session with MSU librarians in advance and bring them to the library. Students often come with no idea or just a vague idea of a topic for their research project, which is usually a paper. Instruction librarians explain that they can get topic ideas in many different ways including the Web. They may be searching the Web and stumble upon a video on YouTube for example that interests them.

The library instruction session includes having the students view a video the librarian has selected and then develop a list of questions based on the video. Next, keywords are selected and students start to search the available resources to discover the answers to the questions. Students are informed that this in-class exercise is used as an example, but they are directed to use this process to discover questions and think more deeply about their own area of interest. It is hoped that they will use this process of discovery in future classes in order to apply critical thinking to their research and increasingly gain knowledge in their field of study as they move through their undergraduate curriculum.

INTERACTIVE LOEX SESSION

During the interactive presentation at LOEX in Dearborn, MSU instruction and reference librarians, Allen and Oberdick started the session by introducing themselves using the active learning Cephalonian Method. Four participants were given colored cards just before the session started; when their color was announced they called out their questions to the presenters (See Appendix A for the list of questions used in this exercise). This stimulated interest and curiosity and engaged the audience right away in the session, and their laughter indicated that they appeared to enjoy the activity. For the past two semesters, the presenters have used the Cephalonian Method during building tours to introduce first year students to the MSU Library. There are twenty cards total including four different colors that correspond to the four stations of the Main Library building tour. In a library instruction session, when a color is announced, the students holding that colored card ask their question and then are encouraged to answer it if they can. The activity sets the stage for a student-centered library instruction session by encouraging them to actively participate in the remainder of the session. Morgan and Davies from Cardiff University started using the method in 2002 because they wanted to present a good first impression of the library to new students, generate enthusiasm, and encourage communication with the librarian and peers (2004).

During the interactive session, conference participants actively participated in a similar activity. First they viewed a two minute video about climate change (http://www.youtube.com/watch?v=zzjOcOcQ90U). Then, while sitting in six small groups of between 4-8 participants at round tables, each table was instructed to list 10 questions they might have if they wanted to learn more about the topic of the video. Each table was equipped with a large sheet of Post-it paper and a marker (See Appendix B for a list of the questions they generated). There was a short pause and a couple of requests to clarify the directions before they got busy with the exercise. When they completed writing the questions, the presenters asked the groups to switch papers with an adjoining table, read the questions that group produced, and as a group determine what they would do next in a class session if they were the library instructor. After allowing them about ten minutes for discussion, a member of each group came to the front to offer ideas. The ideas were diverse and included assembling students into groups and assigning one question for each group to research; helping the students focus from broad to narrow questions; grouping the questions together according to theme; brainstorming keywords for the questions; and encouraging them to look at background information first to help them understand the topic enough to determine a focused question. Each group agreed that there were many ways to approach a guided-inquiry for this topic.

The presenters explained that when they facilitate this activity in a class session they will look over the list of questions students generate and select one that is not too narrow or too broad and use it as an example to search the resources. The presenters address any broad questions by suggesting that they can be discussed as part of an introduction but probably would not be focused enough for a 5-6 page paper. In addition, narrow questions are discussed as well and students are directed to broaden their focus if they cannot find answers within the library resources. Often students need assistance selecting keywords and this is a class brainstorming activity based on the research question chosen as the example. The goal for showing this example is for the students to see that they can use this process of developing questions about their topic in order to deeply and critically examine issues to explore.

Next, the presenters explained that when it is time to search the resources during the library instruction session, Michigan State University librarians split the class into groups and assign each group one of five sources to explore. They include background information, books, articles, viewpoints, and the free Web. They are encouraged to use the keywords they've already generated and to search as they normally would if they were searching in their dorm, at home, in the library or wherever it is that they go to study. The students can search alone or with other member of their group. After the groups have been given a few minutes to search, they are asked to come up to the front of the class and demonstrate how they searched the sources. At this point, instruction librarians discuss the resource the student has found, often something from the open Web. The pros and cons of their selections are discussed and the librarians show them a parallel library resource that will give them the same type of information, but is more authoritative and trustworthy. Instruction librarians pay particular attention to discussing the benefits of reference resources to give students

The LOEX interactive session concluded by having the participants use clickers to answer questions about whether they have used inquiry-guided learning in their library instruction classes, the pros and cons of using it, and student reaction. Feedback from the audience was generally positive for using inquiry-guided learning. One librarian commented on how she has used Google Docs to facilitate keyword brainstorming. She discussed that she distributes an encyclopedia article and asks the students to read it and then identify keywords that she projects on a spreadsheet on the screen.

The reasons given for why participants chose using inquiry-guided learning were mostly because it was more engaging for the student and the librarian, and promoted student-centered learning. Most of the participants indicated that inquiry-guided learning was not included in their college or university course outcomes, which raised some questions about whether or not it is something to pursue at their own academic institutions. One librarian commented that the inquiry process (as a process of new discovery) is particularly engaging to students. As students continue to develop new questions, they are less likely to complain that they've already "been there, done that" if they have already received library instruction for other

classes. When asked how the participants think students react to inquiry-guided learning, the responses were mixed. One librarian commented that shy students might resist this technique. Another librarian thought students might react very positively. She commented that when she has used inquiry-based techniques, some students stayed after class to talk more about their research questions and possible sources.

Participants commented that the main challenge of using inquiry-guided learning was the time involved for the librarian and discussion ensued about how these types of activities may take up time that is needed to lecture about research sources and search strategies. However, some participants commented that using by using inquiry-guided methods, the entire class (including the instructor) is involved in the process of discovery, which provides a more interesting session for everyone. The presenters commented that inquiry-guided learning requires the librarian to be more flexible and adept at responding to the questions and issues students come up with, so there is more uncertainty involved and less pre-planned or canned searches prepared.

Conclusion

The presenters have observed the benefits of using active learning and inquiry-guided teaching in their library instruction sessions. Students are alert, attentive, and participatory. It is hoped that in the future, summative and formative assessments can be completed to support the librarians' observations. The presenters believe that during the interactive session, the LOEX conference participants experienced some of the ambiguity this process of discovery encourages. This in turn spurred creative dialogue which resulted in a discussion of diverse ideas, similar to how the presenters experience a library instruction session with first-year students at Michigan State University.

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1. Who is Ben?
2. Who is Michelle?
3. How do you use these cards with MSU students?
4. What is the meat of this presentation?

Where did the info come from?
What are the "gases" causing problems?
What is the most environmentally harmful emission source?
What happens if we don't act now?
Which species is most resistant to climate change?
How do we know that these are the hottest days?
How long have we been recording info?
How might a volcanic explosion affect weather?

Where do the gases come from?
What gases are they?
Is climate change inevitable?
What is the evidence that it is occurring?
What is the timeline predicted?
Can we reverse the effects?
Who in the UK produced that ad?
Are there any regulations for emission of gases?
How do wind turbines help?
What is the environmental impact of wind turbines?

What can I do as an individual and where do I go?
What solutions exist?
Do all solutions exist now?
How efficient is wind power?
How costly is wind power?
If solutions exist, why aren't they being implemented?
Is climate *really* changing?
Is this a worldwide impact?
Are some areas impacted more?
Are we all going to die?

Why cold winter if we have "global warming?"
What are solutions?
Do I have to give up my car?
What gases?
What makes gas?
What can the government and I do?
What/who made the U.K. video?
When was video made?
Don't windmill farms kill birds?
What is meaning of life?

Who created this video?
What is the climate challenge?
What can I do about global warming?
What are the causes of global warming?
What is my government doing about global warming?
How does this issue affect the polar bears?
Do all scientists agree that this is happening?
How does it affect the weather patterns?
What will life be like in 15 years if nothing is done?
What are specific types of pollution that contribute to global warming?

What can I do about this?
Is it true?
Is this preventable/solvable?
What is climate change?
Does this affect the world in different ways?
So are windmills/solar/alternative energy better?
Hostile for whom/what? Humans?
So what?
What's available to combat climate change?
Does anyone benefit from climate change?