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ORCHESTRAL MANEUVERS FOR ASSESSMENT IN BLACKBOARD: PUTTING TOGETHER HARMONIC ENSEMBLES OF TOOLS TO MEASURE SHORT AND LONG TERM LEARNING

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INTRODUCTION

There's no denying that assessment is a central issue for learning. Since teaching and learning entered the technological era, assessment of online learning invited additional debates. There are many ways to employ technology for online instruction and as many ways to use it to assess learning. This paper, however, focuses on assessment in Course Management Systems (CMSs), and in particular, Blackboard. Despite the fact that CMSs have been around for at least a decade, literature indicates that librarians are still exploring ways to teach information literacy (IL), and are overlooking assessment. Cox (2002) offers suggestions on using Blackboard to extend one-shot library instruction. Five years later, Jackson (2007) surveyed 171 California State University system librarians to assess their use of CMS as a teaching and learning tool. She concluded that "better integration of library resources and services into learning management systems is needed" (p. 459). In 2013, at an Australian university, Margot McNeill, Maree Gosper, and Jing Xu reviewed assessment technology literature and reported on a survey exploring academic practice in using technologies to assess learning. Their findings confirm that assessment using technology is primarily limited to lower order learning. This is a critical issue, considering that more than 90% of colleges and universities use CMSs. A Campus Computing Project survey lists Blackboard, Moodle, and Desire2Learn as the major market shareholders (45%, 20%, and 11% respectively), and 74% of universities using a CMS state that their top priority is assisting faculty with IT integration into instruction (Green, 2012). Thus, whether IL librarians teach a 50 minute session or a term-long course, this paper will take a brief look at learning and assessment, particularly as it relates to CMS environments. I will also discuss assessment within the context of Bloom's learning orders, and illustrate how various assessment tools can be used

to target multiple levels of learning. While I will use Blackboard as an example to illustrate my point, ideas discussed may be transferred to other CMS environments.

A BRIEF BACKGROUND

Bloom's Taxonomy

According to Pohl (2000), Benjamin Bloom's research in 1956 led to the well-known Bloom's Taxonomy, which listed six hierarchical categories of the cognitive domain with Knowledge at the lowest end and Evaluation at the highest. Bloom's hierarchy was later revised by his former student, Lori Anderson, who changed the category names from noun to verb forms and reversed the top two categories (see Figure 1). The top three categories represent higher order learning, whereas the bottom three categories represent lower order learning.

Figure 1: Bloom's Taxonomy Revisited
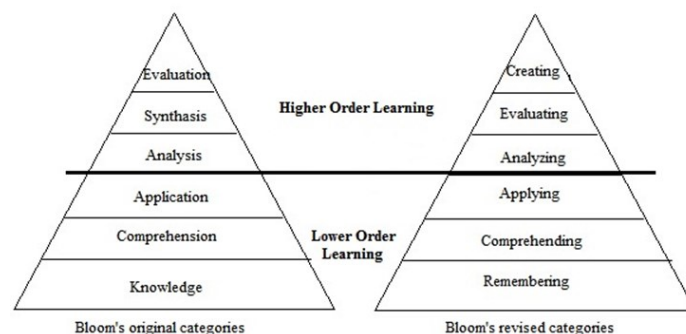
Bloom's Taxonomy has been suggested as a way to set learning objectives when it comes to teaching IL and were a part of the wording of ACRL's Information Literacy Competency Standards (ACRL, p. 6). Many librarians have seen or used a version of the popular formula used to create learning objectives (Bloom's Learning Domain + in order to + Purpose = Learning Objective), perhaps at an ACRL Immersion Program.

Assessment

In terms of assessment, there are two types: summative and formative. The former evaluates learning at one point in time, where the latter is a process. Wiggins, Grant, & McTighe (2006) classify assessment according to priorities: worth being familiar with, important to "know and do," and "enduring" understanding (p. 71). In short, summative assessment is appropriate for assessing facts, focuses on content, prompts short responses, and is suited for Bloom's lower three categories. Examples of summative assessment tools are multiple choice, matching, true/false, fill-in-the-blank, or short open-ended responses. Formative assessment, on the other hand, evaluates higher order learning, focuses on process, and requires judgment. Here students need to show their understanding of the process and their ability to repeat it or apply it in parallel situations. Examples of such formative online assessments are presentations, journals, blogs, and discussion boards.

USING BLOOM'S TAXONOMY IN ONLINE ASSESSMENT

Course Management Systems usually offers a range of online assessment tools that can be used to target higher and lower learning such as blogs, collaboration tools, journals, tests, and surveys. Although my focus is on tools available in Blackboard, the discussion here applies to other CMSs as well. When deciding on the appropriate tools, it helps to consider Bloom's Taxonomy, just as we do when we create learning objectives. Figure 2 illustrates ways that skills can be expressed to accomplish a specific purpose, and offers suggestions for selecting optimal assessment tools. Keep in mind that the Bloom's learning domains and assessment tools do not necessarily reflect a one-to-one relationship. Indeed, some tools can be used to assess multiple domains; for example, student journal entries can be used to assess any of the higher order learning domains.

Figure 2: Mapping Bloom to Online Assessment

Bloom's Domains	Sample Verbs	Purpose	Optimal Online Assessment Tools
Creating	Design, construct, plan, produce	Construct new information	Collaboration, Journals, Blogs, Wikis,
Evaluating	Critique, theorize, assess, determine	Judge according to criteria	Self or Peer Assessments, Discussion Boards
Analyzing	Compare, deconstruct, examine	Question/Examine Information	Journals, Discussion Boards, Tests
Applying	Show, use, solve	Apply knowledge to new situations	Quizzes, Tests, Surveys
Understanding	Describe, explain, estimate, predict	Understand/Interpret meaning	Quizzes, Tests, Surveys
Remembering	List, name, identify, retrieve	Memorize/Recall facts	Quizzes, Tests, Surveys.

It is important to understand, however, that the previously mentioned pervasive tendency to use summative approaches is not surprising – the two most used tools in online instructions continue to be discussion boards and online quizzes (McNeill, 2013). Summative assessment tends to be quantitative and easier to grade, collect, and analyze using technological tools. Formative, on the other hand is qualitative and less easy to grade, collect, or analyze. Most librarians administer IL instruction in an integrated fashion over 50 minutes or less and, while there has been a slight increase in IL for credit, the numbers are still low (Burke, 2011; Davis, 2011). Unlike credit bearing IL instruction, one-shot integrated instruction tends to limit online tools that maybe available to librarians (depending on their ability to fully integrate at the instructor or teaching assistant level).

Whether you are teaching IL as a credit bearing course or as one-shot instruction, you can design a robust system of online assessment tools that can work well in either context. What you have to keep in mind, however, is that formative assessment will be time consuming and, depending on class size, it may be best to think of online assessment as a system where components build on one another towards major "corner stones," rather than invest time assessing each step of learning. In other words, each component may not need to be graded, per se, but performance on every level must feed into one of the "corner stones" where feedback is given to students (see Figure 3).

Figure 3: Sample Online Assessment System
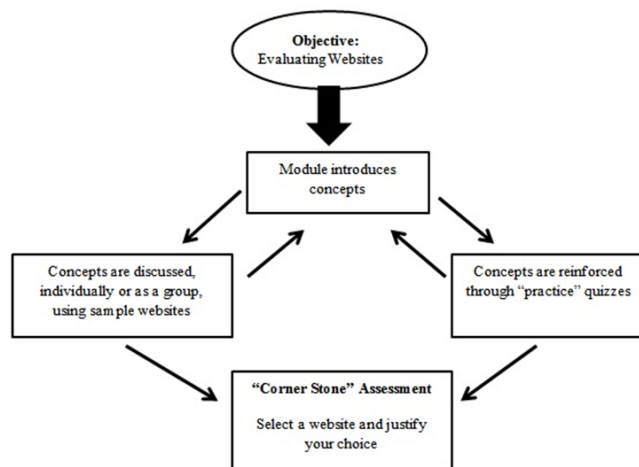
ASSESSMENT IN BLACKBOARD

As an example, I will use Interpretation and Argument (I&A), a course taught at Carnegie Mellon University's English Department. I collaborate with instructors of the course to teach an information literacy component that targets their research component where students must present their argument using 1-3 outside sources. My assessment system includes three components that interrelate and move students towards one objective: the

ability to revise their research proposals and provide a short list of scholarly materials relevant to their topic (see Figure 4).

The first component is a constructive pre-test where students answer an 11 question test aimed at assessing what they know about finding, locating, and accessing information (ACRL IL Standards One, Two and Three) at Carnegie Mellon. The test is summative and formative. It requires short responses, but also asks them to evaluate a website, and to evaluate their topic according to search words they selected and implemented in the library catalog and a database of their choice. Student results here consistently showed higher competency with Standard One and lower competencies with Standards Two and Three. This is where the second component comes in to build their skills through discussion and interactive activities. Before class, I use "Attempt Statistics" – a tool in Blackboard that tracks student answers and provides a general idea of their performance. This information highlights problem areas and allows me to provide them with feedback. I also model the research process by selecting one of their topics as a starting point. Students are asked to judge the quality of the topic statement, and provide alternative phrasing or wording. I use the information to cover problem areas and to provide examples of alternative approaches. I continue by implementing suggested wording or phrasing in various databases, discussing successes and failures encountered during my implementation. I also ask for suggestions and point out tools that may be helpful in the process. Finally, students are given time to complete a five-step activity that reinforces the modeled process by asking them to apply what they learned to come up with 1-3 scholarly sources for their topic. Students are reminded that the results of the activity will be useful when they need to revise their topic and present their contribution paper in the following week.

POINTS TO CONSIDER

- While it is true that I do not actually grade student's work, assessment is based on real-time interaction with students, and later as they post their revised topic statements on Blackboard. The system works because students must succeed at each step in order to succeed at the "corner stone" component (their final paper). In addition, as a TA in the course, I am able to keep record of student responses to my activities for future study, and to share with the instructors of the course.

- Using Bloom's taxonomy enabled me to look more deeply at how online assessment tools work. For example, using journals allows you to assign points to each entry; online rubrics can be incorporated into assignments easily, but you still have to grade each assignment individually; modules are a great way to create a guided learning activity where you can embed constructive quizzes; blogs and wikis are great to assess students' ability to analyze, evaluate, and create.

- Selling this to faculty and/or instructors is easier when you have developed the tools and are able to demonstrate how they fit with their course objectives (preferably seamlessly and with the least possible effort on the instructor's part, especially if you're asking them to make concessions for grading).

- That said, it is important, if at all possible, ask for a "mock-up" course to be created so you can play around with assessments. In Blackboard, this is called a development course. It only moves into production when the course goes live. Tip: Be sure to export your assessment tools, so that you can easily import them into other courses.

CONCLUSION

Before designing this system, I gave instruction and had no way to know how individual students progressed. Instructors who assumed that students learned the skills were disappointed when a student's paper didn't reflect this learning process. But more importantly, they had no easy way to identify the problem. This multi-dimensional system allows the librarian and instructors to collaborate towards providing more effective and holistic learning. In this paper, we have seen how Bloom's Taxonomy can be used to select appropriate assessment tools. While the discussion in this paper focused on one-shot instruction, librarians who teach credit bearing IL courses can also benefit from this approach. This is important because research shows that online assessment in CSM environments, whether it is offered as a credit bearing course or as one-shot instruction, remains limited to lower order learning and is in need of better integration. Thinking about assessments as a system provides flexibility and opportunities for collaboration between librarians and instructors. We have seen how such a system allows Interpretation & Argument instructors to better understand student performance, and librarians to better participate and influence that performance.

Figure 4:
System for Interpretation and Argument
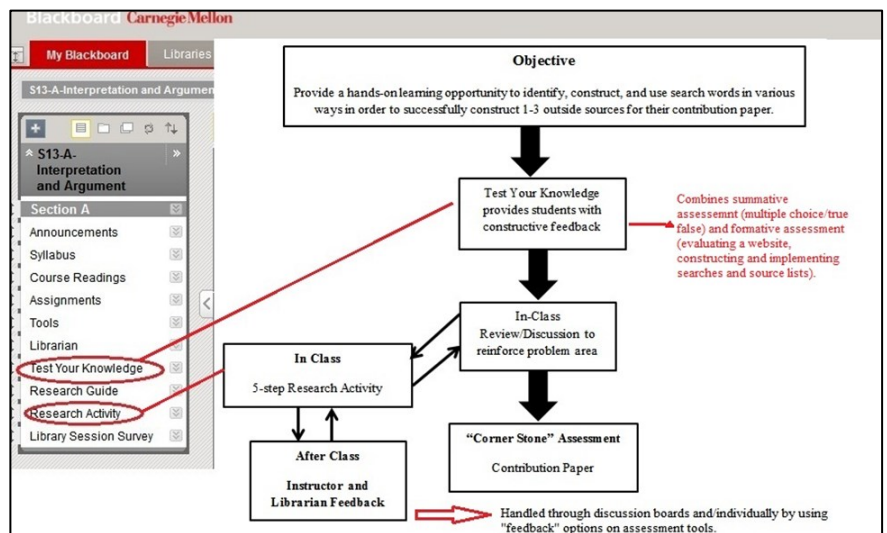
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