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# FLIP THE CLASS, NOT THE CANOE! METHODS FOR FORMATIVE ASSESSMENT IN THE FLIPPED LIBRARY CLASSROOM

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## INTRODUCTION

Library instruction sessions often take place in the “one-shot” format, with librarians addressing a number of information literacy learning outcomes in a single class session. The flipped class model has been applied in library instruction to help offload some content delivery to activities that occur prior to the librarian’s face-to-face interactions with students. This model offers the unique opportunity for librarians to assess students’ learning and understanding prior to the in-person portion of instruction sessions. In the LOEX 2019 interactive workshop described here, the presenters walked attendees through a review of the definitions of “formative assessment” and the “flipped class model,” offered an instructional design model for integrating technology-enabled formative assessment into the design of a flipped one-shot session, and invited attendees to develop some of their own formative assessment questions while also identifying types of technology that would assist with their assessment of student learning.

## BACKGROUND

Before discussing methods of integrating formative assessment into a flipped class model, the presenters reviewed definitions of the terms “formative assessment” and “flipped class.” The theory of formative assessment, developed by Black and Wiliam (2009) and Wiliam and Thompson (2007) and based on Ramaprasad’s notion of “feedback” (1983), tells the instructor “where the learners are in their learning,” “where they are going,” and “what needs to be done to get them there” (Wiliam & Thompson, 2007, p. 63). Though the terms “formative assessment” and “assessment for learning” are often used interchangeably within the literature, there are nuanced differences in definition. Wiliam and Thompson distinguish formative assessment from other types of assessment by necessitating that it allows instructors to adapt the teaching and instruction itself, stating that “an assessment is formative to the extent that information from the assessment is fed back within the system and actually used to improve the system in some way” (2007, p. 61). Though both theories can be applied within the same assessment tool or question, “assessment for learning” provides feedback to students and may allow students to grow their understanding, whereas “formative assessment” allows instructors to adjust their teaching styles and content to accommodate those students’ needs. Formative assessment can be formal or informal, so long as it informs the instructor of the needs of the students while the learning is taking place.

The concept of formative assessment is not new in information literacy instruction. In 2009, Megan Oakleaf discussed the use of formative assessment to revise instruction “on the fly” in her “Information Literacy Instruction Assessment Cycle” (p. 544). Other studies have explored the effectiveness of specific examples of formative assessment activities in information literacy instruction (Dunaway & Orblych, 2011; Seely, Fry, & Ruppel, 2011). During the presentation, LOEX attendees were asked to share their answers to the following questions regarding formative assessment in their practice:

- Who assesses learning during one-shot instruction?
- What methods do you currently use to assess one-shot instruction?

Everyone in the room reported that they do some type of assessment during one-shot instruction. When asked to provide specific examples of the assessment methods they currently use, audience members offered a variety of answers such as “give quizzes” and “Google surveys.” Others reported walking around and looking at student work. One individual offered a method for having the

students report their confidence levels from 1-5 using their fingers. The presenters offered some additional examples including having students raise their hands, direct conversations with students, and simply observing student facial expressions.

During the LOEX workshop, the presenters also asked who was currently applying a flipped class model in their instruction. A little less than half of the attendees reported that they were working in flipped classes. The presenters then offered a brief review of the definition of the “flipped class” as a teaching method wherein large portions of content delivery and foundational knowledge-focused instruction are addressed through pre-class activities, and class time is reserved for application and guided practice (Banks & Henderson, 2019). The notion of a “flipped” class emerged in the late 1990s after technological developments enabled teachers to deliver instructional content online prior to an in-person class session (Baker, 2016; Bishop & Verleger, 2013). In the time since, academic librarians have found the model useful by allowing a “double-shot” of information literacy instruction (Loo et al., 2016, p. 3), but also a challenge to implement because it relies on the support and collaboration of teaching faculty (Arnold-Garza, 2014; Berg, 2018; Datig & Ruswick, 2013; Loo et al., 2016). When applied to the one-shot library instruction class, the model enables librarians to move content-driven instruction to pre-class assignments, providing more time to help guide students through the application of information literacy skills in an in-person setting.

## **INTEGRATING FORMATIVE ASSESSMENT IN THE FLIPPED CLASS MODEL**

A key component of formative assessment is the ability to adapt one’s teaching methods to address the needs of learners—a task that is difficult to do “on-the-fly” during traditional one-shot library sessions given the limited class time. To remedy this, the presenters suggested that a flipped class model be applied to library instruction and that formative assessment be intentionally designed and carried out at a point when instructional practices can be altered. In the flipped class model this point of assessment can occur after or during pre-class content delivery and prior to in-person/in-class interactions with students.

### **<Figure 1: Flipped Class Model for One-Shot Instruction>**

Many strategies for formative assessment in the traditional one-shot setting are informal with information about student learning garnered from face-to-face interactions. Application of the flipped class model leaves the instructor at a disadvantage—when activities are completed away from the classroom, librarians can no longer ask students to raise a hand, provide verbal feedback, etc. Formative assessment, therefore, should be carefully planned in advance, and technology should be utilized to collect information regarding students’ understanding prior to the in-person portion of instruction. The presenters proposed a model for this instructional design process, which is mapped below:

### **<Figure 2: Instructional Design Model>**

This model applies the cyclical nature and backwards design of the well-known ADDIE (Analysis, Design, Development, Implementation, and Evaluation) Model (Davis, 2013) and the Dick and Carey Instructional Model (Dick, 1997). The model begins with the construction of student learning outcomes to help determine the scope of the class and plan “where the student is going” (William & Thompson, 2007, p. 61). In this case, the learning outcomes are intended to be “one-shot” or class-level, rather than programmatic. Between the next two steps in the model, the visualization includes a double-ended arrow. This denotes the interactive nature of the two steps—the design of the assessment and pre-class activities should occur in conjunction with the selection of the technological tool(s) needed to deliver content and assess understanding.

Workshop attendees were asked to consider which types of assessment questions are more important to learning: questions designed to ensure that students attempted a pre-class activity, or questions designed to determine where students were in their path to mastery of the learning outcome; attendees chose the latter and the presenters agreed. Questions that help the instructor evaluate student understanding provide essential evidence about learning that the instructor can use to adapt their teaching methods and content prior to the in-person portion of the flipped session. The presenters demonstrated sample assessment questions for the student learning outcome of “develop a search strategy that yields relevant results in a database” for an imagined instructional scenario where students first watched an online video on the topic then answered questions in a pre-class assignment. The sample assessment included the questions: “According to the video, what type of words should you include in your search? What type of words should you avoid? Apply the suggestions from the video to write out a sample search for your topic.” Attendees were asked to note that the initial questions provide feedback to the student and guide the student through the learning process, but the final question would help the instructor assess the students’ understanding of the learning outcome.

The presenters then asked the attendees to author formative assessment questions of their own. Attendees worked in small groups on the second column of the session handout (Appendix A). Session participants discussed their work in small groups then shared out some of their ideas. Many authored questions that would help them as instructors view the students’ understanding. One attendee noted that the learning outcomes themselves could be broken down and dissected further through the assessment questions. For example, the learning outcome of “identify relevant sources from a list of search results” may require questions that assess how students think about and apply the term “relevant.”

## TECHNOLOGY TO COLLECT ASSESSMENT DATA

The flipped model described earlier provides the opportunity to assess student learning at a point when the in-person instruction can still be adjusted and altered to accommodate students' needs. However, because the instructor is not face-to-face with students when that assessment is carried out, technology must be used to help collect information about where the students are in their learning. An array of technological tools can be applied in different ways to help librarians gauge student learning. The presenters aligned some of these tools with different types of assessment questions (Table 1). Some examples of technological tools suggested by the presenters included:

### Surveys and quizzes

Online survey software such as Google Forms and LibWizard offer multiple choice questions, short text fields, and long text fields which allow librarians to assess student understanding of both low- and high-level content. In the conference session, these types of survey tools seemed well-known and commonly used by instruction librarians.

### Online tutorials

Survey and quiz questions can be built directly into interactive instructional tutorials. For example, the Understanding Plagiarism tutorial from Eastern Michigan University ([https://www.emich.edu/library/help/tutorials/assets/plagiarism/story\\_html5.html](https://www.emich.edu/library/help/tutorials/assets/plagiarism/story_html5.html)) contains some questions designed to keep students engaged with the tutorial and others that assess deeper understanding of the topics covered. The tutorial also generates a pdf of student answers that can be sent to the instructor prior to the start of the in-person class. Librarians can create similar tutorials using the Articulate Storyline software.

### Citation management software

Many citation management systems, such as EndNote and Zotero, have a function that will allow users to share their citations with another individual. When shared with a librarian, this function can be used to assess the sources students are selecting while simultaneously providing students the opportunity to learn to use the citation management software itself.

### Learning management system discussion boards

Discussion boards are a functionality of most learning management systems. The presenters recommended their use for high-level thinking questions and reflections. These boards can be used to encourage interactive discussions between students and provide a space for learners to ask questions and note curiosities.

### <Table 1: Mapping Assessment to Technology>

Attendees were invited to discuss other technologies and tools that could be used in gathering information about student learning/outcomes assessment.

## SAMPLE LESSON PLANS FROM PRESENTERS

The presenters offered two sample lesson plans for traditional one-shot sessions which they transformed into flipped classes with formative assessment embedded between the content delivery stage and face-to-face interactions with students. Sarah discussed how she was in the process of transforming an in-class lesson she uses with sections of First Year Writing on the differences between popular and scholarly sources. Rather than doing this work in class, she plans to ask instructors to have students complete an online version of this activity (Google Form) before coming to a research instruction session. The form contains open-ended questions, asking students to look at various characteristics (author, purpose, audience, etc.) of two different articles (one popular, one scholarly) on the same topic. The feedback students provide via this form will allow her to understand what they might need more time reviewing at the start of the in-class session before learning about search strategy. She explained how, while critical in content and context, doing this activity in-class has been very time-consuming which leaves little class time for students to learn about search strategy or practice finding academic sources, which is the primary purpose of their visit. Offloading the activity so that students complete that work on their own time will hopefully allow them to come to the session with the knowledge they need about different types of sources, so they can focus their time on searching, evaluating, and reading sources.

Kelly discussed a flipped lesson she teaches for a graduate level biology course. In the past, course instructors requested that she address a large number of student learning outcomes within a single class period, including: differentiate research and review articles, practice searching academic databases, establish library accounts, request items through interlibrary loan, and use a citation manager to save and cite sources. Though many of the outcomes focused on foundational knowledge for library research, the sheer number of them made it difficult for her to present the relevant content, allow time for students to apply their knowledge, and assess

and redirect learning within a single class period. She chose to flip the class to use class time to guide students while they applied their research skills. To do this, she created an assignment where students set up their library accounts, watch a video describing research vs. review articles, practice searching, and begin using citation management software prior to their session with the librarian. To assess student learning, she used the built-in share function from a citation management software which allowed her to simultaneously assess whether the students were able to navigate the software and if they were able to locate and differentiate research and review articles. If students seemed confused or had misconceptions, she was able to address the issues either individually prior to class via email or as a group during the in-person session.

After the discussion of the sample lessons, the presenters invited LOEX workshop attendees to complete the last column on the worksheet (Appendix A) where they chose technologies that would align with the assessment questions they had written earlier in the workshop.

## CONCLUSION

At the close of the session, the presenters invited questions and comments from the audience regarding the use of formative assessment in their own flipped classes. One attendee was cautious about the use of the flipped model and expressed trouble “getting students to do the work,” other attendees offered additional examples of flipped class activities that could be used for formative assessment, such as collaborative paragraphs written using Google Docs and shared spreadsheets for annotated bibliographies.

Though the presentation covered the design of formative assessment questions and selection of technology to enable the assessment for a flipped class, the presenters acknowledged that the final tenet of formative assessment--the question of “where are the learners going” —was beyond the scope and timeframe of this session. The presenters encouraged the attendees to think further outside the workshop about how they would adapt their in-person teaching strategies and practices to meet the needs they would uncover from the pre-class formative assessment.

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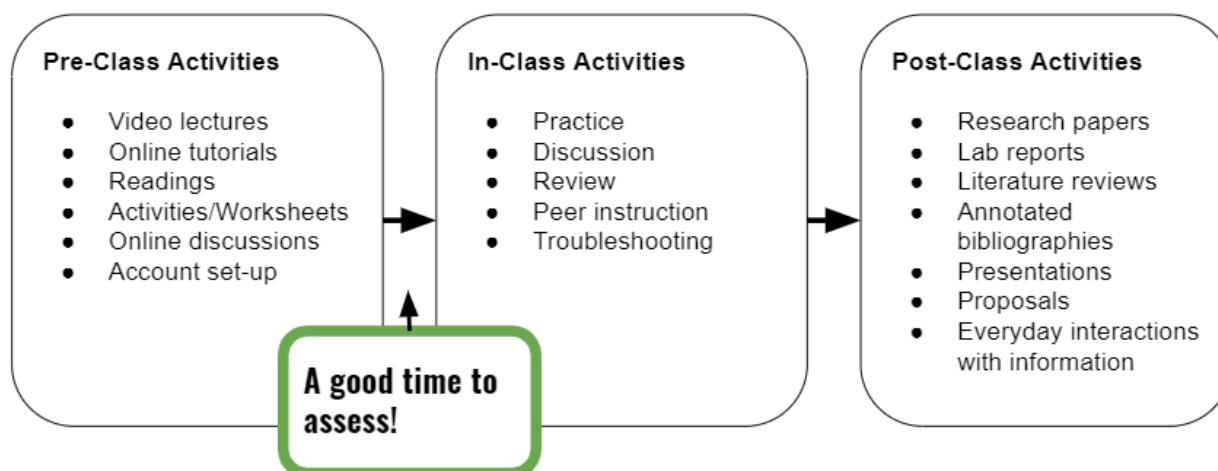
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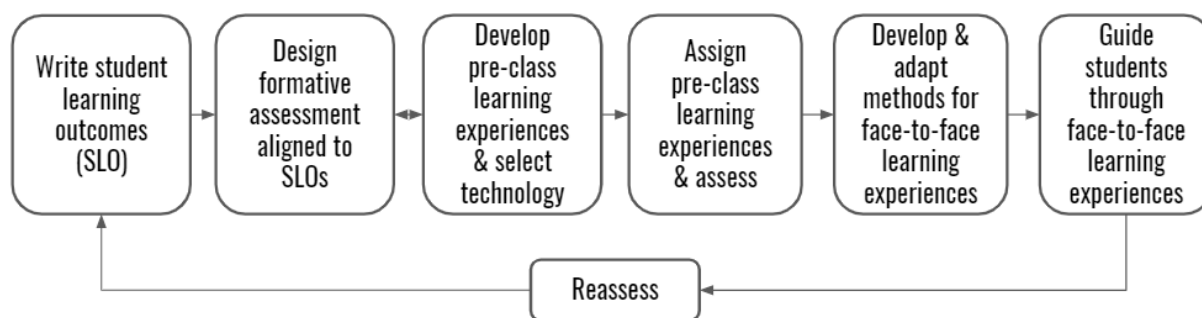
## APPENDIX A: SESSION HANDOUT/ACTIVITY

Student Learning Outcomes	Formative Assessment Question(s)	Technology Used to Assess Learning
Develop a search strategy that yields relevant results in a database	What is your research topic? What are the 2 or 3 main ideas of that topic? What are some other ways to describe those ideas? Try a search with those terms and describe what you found.	Google form with short response text fields and paragraph fields.
Differentiate between research and review articles		
Identify relevant sources from a list of search results		
Identify curiosities/interests after reading a source		
Evaluate the usefulness of a source		
[Space left empty for LOEX attendees who opted to write their own learning outcomes]		

**Figure 1: Flipped Class Model for One-Shot Instruction**



**Figure 2: Instructional Design Model**



**Table 1: Mapping Assessment to Technology**

Types of Assessment Questions	Suggested Technology to Assist Assessment
Lower order thinking skills ("Define," "list," "state")	<ul style="list-style-type: none"> <li>○ Survey software for multiple choice and short answer questions</li> </ul>
Task-centered ("Watch the video and answer the questions related to the video content.")	<ul style="list-style-type: none"> <li>○ Survey software for multiple choice and short answer questions</li> <li>○ Quizzes built in to tutorials</li> </ul>
Metacognitive analysis, journals, curiosities, reflections. ("What questions do you have after completing the activity?", "What experience do you have with X?")	<ul style="list-style-type: none"> <li>○ Survey software for long-form text</li> <li>○ Learning management system discussion boards</li> </ul>
Citation selection, applying search strategies, starting annotated bibliography ("Select 2 review articles and 2 research articles and save them to your class folder.")	<ul style="list-style-type: none"> <li>○ Citation management systems</li> <li>○ Database email functions</li> </ul>