Asking Questions in the Classroom: An Exploration of Tools and Techniques Used in the Library Instruction Classroom

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Abstract

This study explores the tools and techniques used within the library instruction classroom to facilitate a conversation about teaching practices. Researchers focused on the questioning methods employed by librarians, specifically the number of questions asked by librarians and students. This study was comprised of classroom observations of a team of librarians working towards standardized learning outcomes; members of the team had the freedom to independently develop lesson plans and choose teaching approaches for each class. Observations measured the frequency of questions asked of and answered by librarians and students in library instruction sessions via oral discussion, worksheets, and polling. Researchers also noted the use of visual aids and storytelling as tools to engage students in conversation. The variety of tools and techniques observed in this study indicate that librarians exercise a great amount of autonomy in the classroom while working towards standardized learning outcomes.

Keywords: pedagogy; engagement; library instruction

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Introduction

Librarians have a responsibility to study classroom practices in order to more effectively support and develop teaching within the field of library instruction. When classroom research is conducted, it is important that methods and techniques are analyzed as tools employed by teachers; the successful application of a technique or methodology has less to do with the fidelity of the tool itself than with the skill of the teacher. This study seeks to identify basic techniques employed by librarians to facilitate active student participation within the one-shot instruction classroom. The researchers were interested in observing how librarians ask questions in the classroom and how students respond. Of specific interest was the number of questions and answers exchanged between librarian and student, the categories of "scripted" and "improvised" questions asked by the librarian, and the technique used by the librarian to initiate each question. This study took place among a team of librarians who participate in a shared community of practice, which makes the observed difference in techniques and tools used striking, as it highlights the autonomy each librarian exercised to achieve common learning outcomes.

Background

This study took place at the University of Alabama, where undergraduate enrollment hit 31,958 during the 2015-2016 academic year, with 7,211 full-time first-time first-year students. In addition, 1,567 transfer students were enrolled. Nineteen percent of these students were over age 25 (as compared to the national average of 12%). The University's Amelia Gayle Gorgas Library has a long-standing commitment to effective teaching and outreach to the First-year Writing Program. Gorgas Information Services, a department of six instruction librarians, is committed to pursuing excellence in teaching; these individuals work together to hone and improve their skills through professional development and peer-feedback. All department members share the teaching load for first-year writing instruction and have a range of teaching experiences.

The University's curriculum includes four first-year writing courses–EN 101, 102, 103 and 104–with over 150 sections offered per semester. Unless students have taken a comparable writing course elsewhere or have tested out of the course, they are required to take the two-course sequence of EN 101 and EN 102, a combined honors section, EN 103, or EN 104 (which is a first-year writing course for a selective service learning program). The writing instructors for these courses range from tenured, tenure-track, and non-tenure track faculty to graduate students in the Department of English. About half of the EN writing classes are taught by first-time graduate student teachers, many of whom will teach the course again during their graduate school career.

Students are required to visit Gorgas Library twice as a part of their EN 102 course. Library instruction sessions take place during regularly scheduled class time and appear on the course calendar as planned class activities. EN 102 instructors work with librarians prior to scheduled sessions in order to make them cohesive and relevant to the current class topics and goals, and they usually attend these sessions along with their students. Library instruction usually relates to a research-based paper assignment that requires outside sources. Each of the two sessions follows a standardized set of information literacy learning outcomes that have been developed to meet the needs of first-year writing students.

EN 102 is the second semester of first-year composition, in which students are introduced to academic writing. For the purpose of this study, five instruction librarians were observed for a total of 32 classes. Observations took place in the Session 2: Source Evaluation, which includes the learning outcomes: "Students will recognize the difference between popular and scholarly sources in order to appraise a source's value within their own research," and "Students will assess a source's original intent, editorial and publication process, and the expertise of its author in order to determine its credibility." In this session students learn how to evaluate a source by researching the author's credibility, identifying the source's process of publication (form of review and editorial oversight), and the general purpose of the source's publication. These learning outcomes, the learning goals of the course unit, and input from the instructor are used to develop lesson plans. Although librarians are teaching to a set of standard learning outcomes, each librarian has considerable autonomy in creating a unique lesson plan that meets the needs of their students. This programmatic use of shared, standardized learning outcomes reflects the way faculty in other areas across campus

address multi-section courses taught by diverse faculty, and it allows librarians to function as faculty-educators.

Literature Review

The literature indicates that librarians have sought to define what it means to be a teacher many times over the years. The importance of this conversation around teacher identity for instruction librarians is its assumed effect on classroom practice, the application of intentional pedagogy, and the promotion of growth opportunities through professional development and continuing education. Referring to the librarian as teacher, Walter asked an important question: "Does saying that one is a teacher refer to one's mastery of an identifiable set of pedagogical skills, or, rather, to the way in which one approaches one's work (in the classroom or outside of one)?" As librarians seek evidence to support their teacher identity, this distinction is important. Do we attempt to measure learning in the classroom or assess the behavior of the person conducting class? Moreover, if we are assessing the behavior as evidence of "teacher," how are librarians learning this behavior? Palmer's (1998) ideas of identity and integrity seek to establish a definition of successful teaching that transcends the how and what of a teacher's practice, stating, "Good teaching cannot be reduced to technique." He continues, "If teaching cannot be reduced to technique, I no longer need suffer the pain of having my peculiar gift as a teacher crammed into the Procrustean bed of someone else's method and the standards prescribed by it" (p. 11). Still, when librarians engage in the discourse of classroom practice, it is necessary to talk about these tools and techniques; while technique is not the sum of a good teacher, it is an important aspect classroom teaching.

In their recent article, Wheeler and McKinney (2015) ask a question librarians have debated for years: are librarians teachers? Respondents in their study noted theoretical frameworks, intentional pedagogy, and other variables that add to the deduction that, if not definitively teachers, librarians engage in teaching. Other studies have measured teacher-identity through analyzing core job requirements, teaching skills (Brecher & Klipfel, 2014), education and preparedness (Walter 2008), and development and articulation of teacher identity (Lupton, 2002). Lupton extends the distinction between teacher-librarians and teaching librarians, stating, "…the teacher-librarian's approach and understanding is grounded in the assumption that their role is primarily that of an educator. In contrast, the

teaching librarian is restricted by operational boundaries that work against the implementation of information literacy" (p. 76). Lupton suggests that "If academic libraries are prepared to support information literacy, there must also be a commitment to support and encourage staff in moving from the role of trainer to that of educator" (p. 82), including professional development access to the wider interdisciplinary conversation about teaching theory and praxis. Wheeler and McKinney (2015) suggest that librarians most directly benefit from and improve through practice and support from their colleagues and their organization.

Oral questioning and the development of classroom dialog is discussed in various ways throughout the literature. Jiang (2014) approaches teacher questioning as a method of formative assessment, allowing the teacher to periodically check-in with students to determine comprehension. Farrell and Mom (2016) explore the usefulness of teacher questions as reflective practice and teacher self-assessment, allowing teachers to "collect data about their teaching and use this information to make informed decisions" (p. 851). Bain (2004) suggests that discussion within the classroom focuses and facilitates critical thought and stimulates learning; when students participate in classroom discourse, they are participating in knowledge creation. Nurkka et al. (2014) assert that the teacher plays the role of mediator in order to "ensure that classroom discussion is conducted at an appropriate level and in a way suited to the learning aims," and "includes dialogic discussion where the teacher opens up space for students to explore their views and experiences" (p. 56). Smart and Marshall (2012) suggest that teacher questioning is a "potentially integral subcomponent to achieving effective classroom discourse" but makes a distinction between inquiry-based (meant to elicit critical thought) and non-inquiry based (meant to evaluate student knowledge) questioning. They suggest that teacher questioning "can serve as scaffolding to support students' construction of conceptual understandings (p. 251). Discussions of oral questioning and classroom discourse are abundant in the education literature; however, they are less prevalent in library literature. Nevertheless, Reale (2016) describes conversation within the library instruction classroom as "pedagogy," a way to crowd-source ideas and knowledge construction, and a way to facilitate conceptualization and thinking. She asserts that generating conversation in the library instruction classroom facilitates inquiry and that, when students join in conversation, they engage in critical thought.

Library literature includes numerous case studies that discuss the pedagogical approaches of information literacy instruction. Hsieh, Dawson, Hoffman, Titus, and Carlin (2014) report on an analysis conducted on four pedagogical approaches used at Rider University; they use a set of pre- and post-tests to measure student learning of two objectives derived from the Association of College and Research Libraries' *Information Literacy Competency Standards for Higher Education* (2000). Their study was an examination of the effectiveness of "active learning" (worksheets) and "preview"–an approach similar to a flipped classroom, where students view asynchronous material and take a quiz before their library visit–as pedagogical approaches. In addition to reporting on their pedagogy study, Hsieh et al. (2014) also provide a thorough review of the literature encompassing the study of pedagogy and information literacy, reporting that "few studies provide evidence of student-learning in relation to teaching methods" (p. 235).

Recent attention has been paid to participatory technologies and pedagogy. Bobish (2001) emphasizes the need to connect new technology to a pedagogical framework to assure sound reasoning. Farkas (2012) notes the benefit participatory technologies have on learner autonomy and the facilitation of reflection. Hoppenfeld (2012) specifically studies web-based polling with the goal of eliciting real-time results from students to "get a feel for who their audience is, what their feelings/experiences are within certain topics" (p. 236). In a study measuring student engagement using traditional clickers, Walker and Pearce (2014) find that students "had stronger, more audible reactions to polling results, especially when a low percentage of the class chose the correct answer." However, their control "non-clicker" group scored higher in areas of increased library usage, information literacy skill acquisition, and classroom engagement, leading the authors to conclude that "traditional library instruction produces better results" than their experimental clicker approach. However, these studies use student assessment to gauge success and do not focus on the teacher.

Methods and Definitions

The researchers selected tools and techniques based on general knowledge of librarian teaching practice, and they verified the validity of their inclusion through initial survey data. Originally, storytelling and analogy were separate variables; however, when analyzing the coded data, the distinction between the two were not clear enough to the researchers. To minimize the effect of this error, the researchers combined the two variables. For the

purpose of this study, the researchers found it helpful to use the following definitions for specific tools and techniques:

> Discussion: Scripted and unscripted oral questioning intended to solicit student response and generate conversation. Coders identified questions as scripted if they appeared on a worksheet, on a visual aid, or posed as a polling question, and all other questions were treated as "unscripted."
>
> Worksheet: A digital or print handout that address the class's learning outcomes and the librarian's lesson plan through the provision of instructions, tasks, and space for written responses to activities, tasks, or instructions.
>
> Web-Based Polling: Asking questions through a web-based polling application such as Poll Everywhere, Socrative, or Mentimeter to elicit quantifiable answers.
>
> Visual Aids: Static and animated graphics and slides that synthesize aspects of the learning objectives or offer a visual representation of the concept being taught. This includes pictures, infographics, and slides/presentation software.
>
> Storytelling: The use of storytelling conventions such as narrative, analogy, and metaphor to help students connect learning objectives, skills, and concepts to tacit knowledge.

The researchers selected these tools and techniques based on general knowledge of librarian teaching practice, and they verified the validity of their inclusion through initial survey data. Originally, storytelling and analogy were separate variables; however, when analyzing the coded data, the distinction between the two were not clear enough to the researchers. To minimize the effect of this error, the researchers combined the two variables.

Five librarians from Gorgas Information Services were surveyed and observed for this study; all hold the faculty rank of assistant professor and share responsibility for providing library instruction for first-year writing classes, in addition to their individual subject liaison roles. All participants had at least one year of professional experience at the time of the study. Participants were chosen because they share a community of practice and often participate in professional development opportunities together; they use departmentally implemented learning outcomes when teaching in this study's designated course (EN 102).

This relationship allows the researchers to observe individuality and autonomy as well as determine commonalities when analyzing tools and techniques used in the classroom.

The researchers used Qualtrics [Appendix 1] to distribute a preliminary survey to each instruction librarian, inviting them to self-report on teaching style, pedagogy, and instructional tools (such as visual aids, graphics, and use of worksheets). Data from this survey guided the development of a coding instrument that was used during classroom observations; the researchers focused on the frequency of use for each tool and technique that the librarians identified through their responses. Three graduate student library employees were recruited to observe the instruction librarians teaching for the EN 102 classes (n=32). These observers used the coding sheet outlining specific variables, such as the number of questions asked, whether students responded or asked questions of their own, the methods used for asking questions, and the other tools or techniques librarians used to foster classroom participation. Data were immediately entered into a spreadsheet for later analysis by the co-investigators. Google Forms, spreadsheets, and Qualtrics were used for data entry and storage. Google Docs was used for the coding sheet documentation.

A total of 32 EN 102 classes were observed. Three of the classes were co-taught by two librarians. The duration of class sessions were 50 minutes (n=12), 60 minutes (n=2), and 75 minutes (n=18).

Findings

As noted, asking questions is a technique teachers use to evaluate student comprehension and foster critical thinking. The researchers were interested in learning to what extent librarians prefer using certain methods of generating questions. The study measured the number of scripted questions and unscripted/improvised questions asked by the librarians and answered by the students, and the number of questions asked by students during the in-class application of discussions, worksheets, and polling.

In the preliminary survey, all librarians indicated that using discussion to ask student questions was one of their preferred methods. However, as seen in Figure 1, in over half of the 32 observed classes, librarians did not use discussion to ask scripted questions. The frequency of unscripted/improvised questions was much higher. Librarians asked at least one unscripted question in 22 of the 32 classes. As seen in Figure 2, 10 or more unscripted

librarian questions were asked and answered through discussion in nine of the classes. These data suggest that the nature of discussion is improvisational, which encourages unscripted questions. Students also asked more questions through discussions compared with polling, with at least one student question in eight of the 32 classes (25%), indicating that students are more likely to respond verbally to oral questioning than to web polling.

Figure 1: Scripted librarian questions answered through discussions

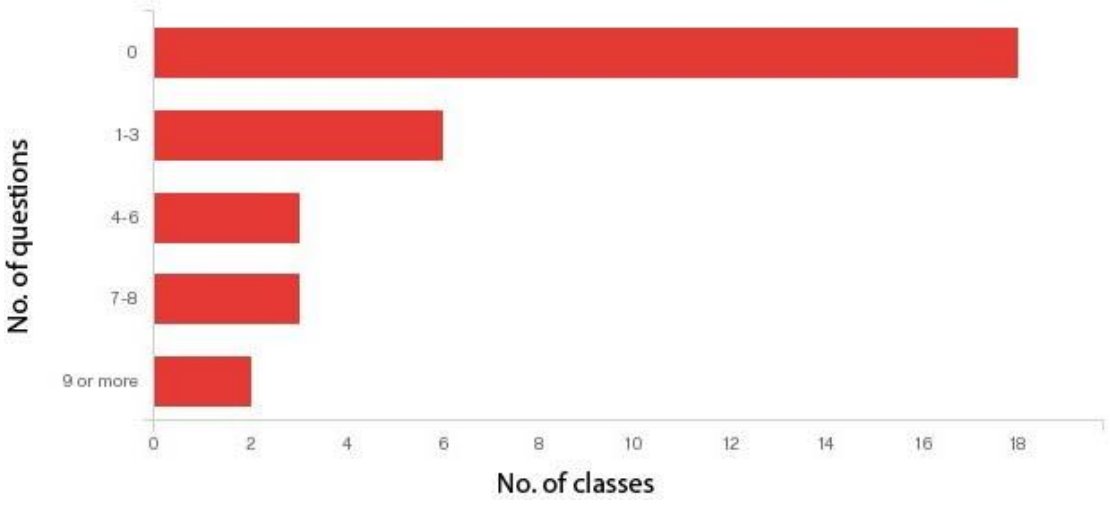
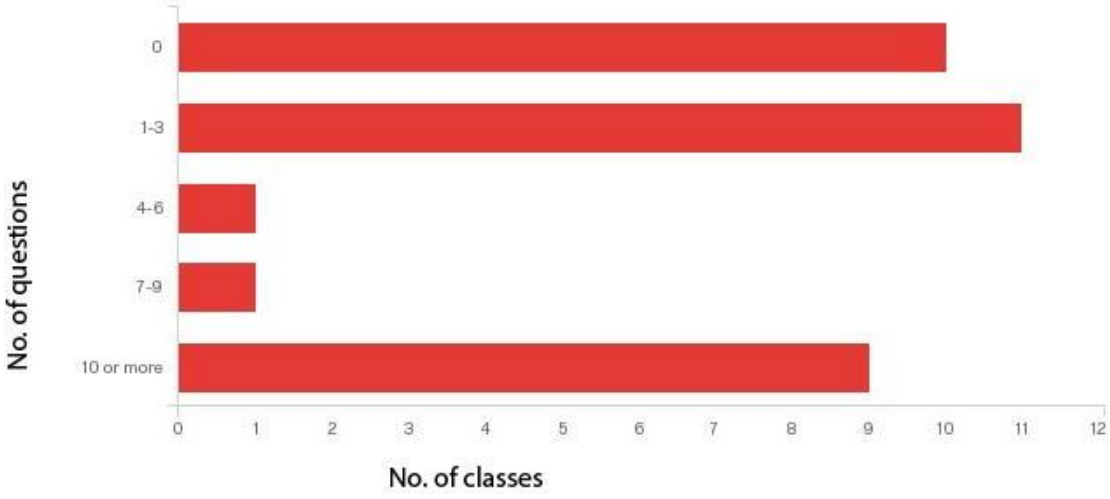


Figure 2: Unscripted/improvised librarian questions answered through discussions



The use of worksheets generated by far the most questions asked and answered. Thirty-one out of 32 classes (97%) featured six or more scripted librarian questions answered via worksheets, with eight classes (25%) featuring 46 or more questions answered (See Figure 3). The frequency of unscripted/improvised worksheet questions was lower. Thirteen of the 32 classes (41%) had 0-5 unscripted questions asked and answered (See Figure 4). These results seem logical, as worksheets are generally static instruments and are difficult to revise mid-class. The researchers did not collect individual worksheet artifacts from librarians; therefore, the researchers cannot definitively report how many questions were asked through worksheets. Based on informal experience, the researchers feel comfortable asserting the possibility that the worksheets generated such a high number of questions because the librarians used them as discussion starters.

Figure 3: Scripted librarian questions answered through worksheets

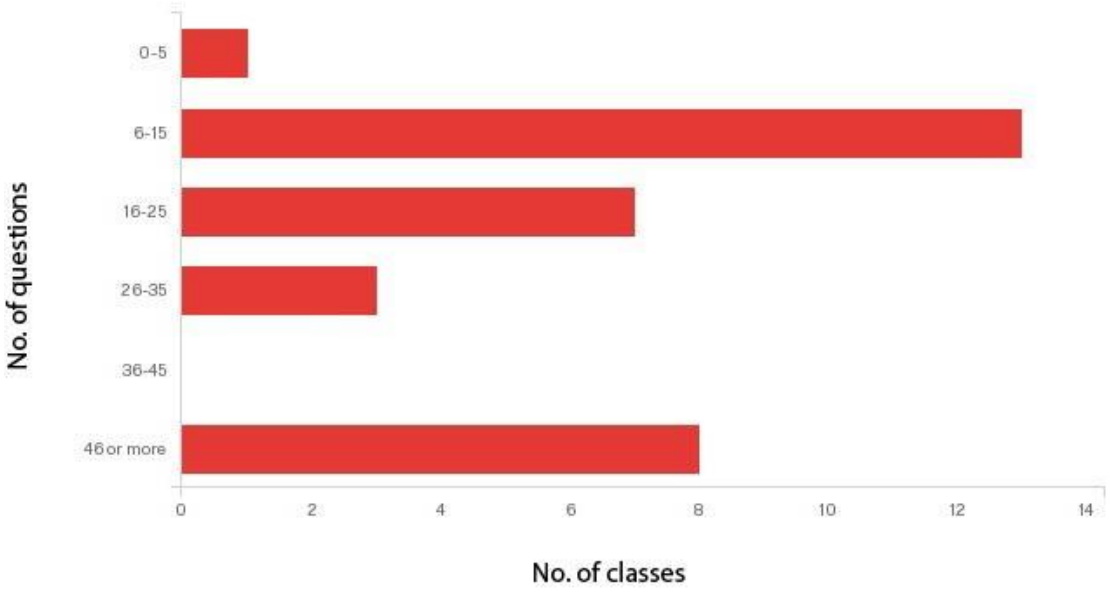
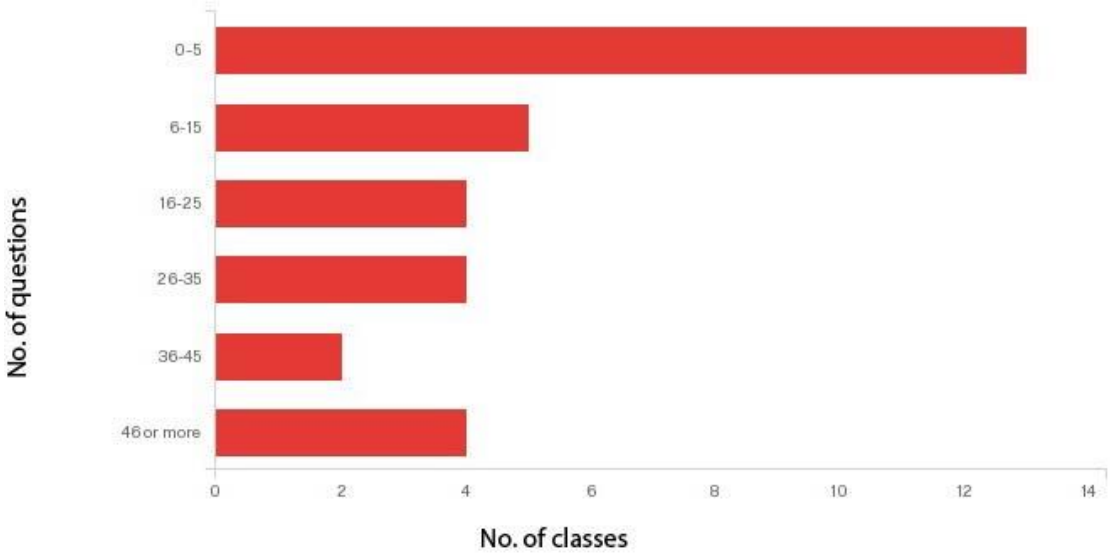


Figure 4: Unscripted/improvised librarian questions answered through worksheets



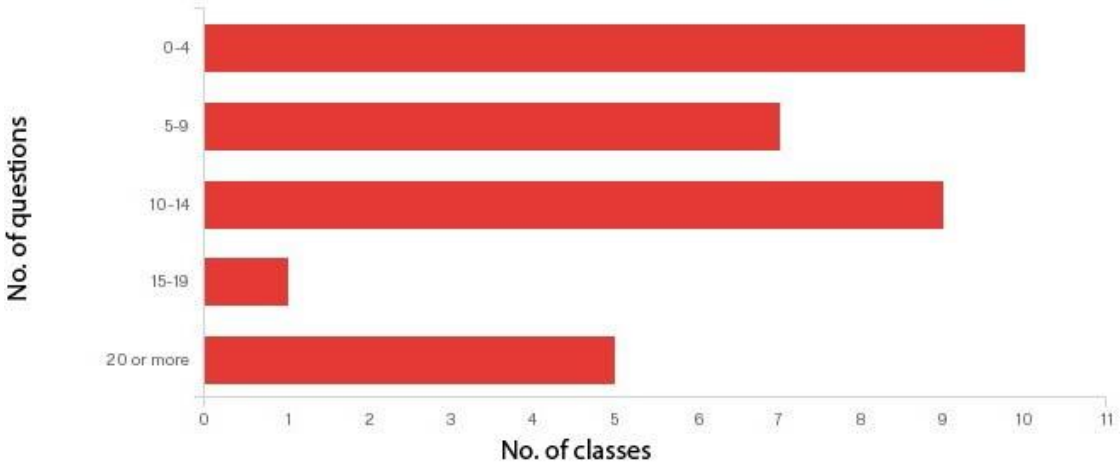
The librarians employed different polling software based on their own preferences, but all of the software used were web-based polling applications. Over half of the 32 classes (53%), had six or more scripted librarian-initiated questions. Chi-Square statistics shows that there is a correlation between individual librarians and the number of scripted questions asked through polling (X^2 (24, N= 32) = 0.00, p = .05).

There is also a statistically significant relationship between the duration of the class and the number of scripted questions asked through polling (X^2 (8, N= 32) = 0.00, p = .05). Out of the 17 classes that had six or more scripted questions asked by librarians, 16 (94%) occurred in the 75 minute classes, as compared to only one (6%) in the 50-minute classes, and none in the 60-minute classes.

Librarians did not use any unscripted or improvised questions through polling in the majority of classes (n=27). Chi-Square statistics shows a correlation between the duration of classes and the number of unscripted/improvised questions asked through polling (X^2 (8, N= 32) = 0.00, p = .05). All of the unscripted/improvised questions asked by librarians via polling occurred in 60-minute (n=2) and 75-minute classes (n=3). The number of student-initiated questions through polling was low. Thirty-one out of the 32 classes (97%) did not have any student-initiated questions through polling, which suggests that polling is predominantly librarian-directed and scripted.

As shown in Figure 5, only 0-4 different visual aids used in the observed classes; librarians in the majority of classes employed visual aids frequently. In five classes, more than 20 different visual aids were used. The number of visual aids used was correlated with the librarians' style of teaching and preferences for teaching tools. For example, one librarian experimenting with the animated presentation software PowToon used a much higher number of visual aids in her classes than others. Gorgas Library has since licensed PowToon, and it is now widely used by many instruction librarians; therefore, the researchers expect that the number of visual aids used will increase. It is also important to note that although visual aids were prevalent classroom tools, not all of the aids included in this analysis were used to ask questions.

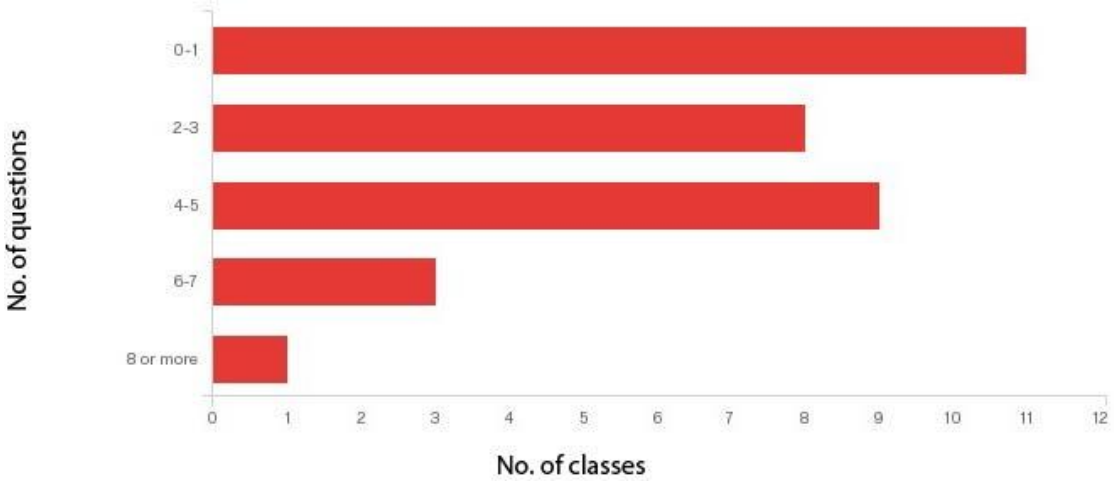
Figure 5: How many different on-screen visual aids were used?



Although this study initially separated analogy and storytelling as categories, the researchers are combining them for analysis, as the data collected did not yield enough distinction between the two to be of any significance. The researchers believe that the coders could have been more thoroughly trained to distinguish between these categories. Furthermore, the coding sheet did not allow the coders to indicate the nature of the relationship between storytelling and asking questions. Librarians incorporated two or more stories into their teaching in 21 classes (See Figure 6). The researchers were interested in learning if the librarians' experience or teaching style might make a difference in the number of stories used, or if a longer class duration might encourage librarians to employ more stories. However, Chi-Square statistics show that there is neither correlation between the number of stories used in class and the librarian instructor (X^2 (24, N= 32) = 0.12, p = .05) nor

between the number of stories used and the duration of the class (X^2 (8, N= 32) = 0.45, p = .05).

Figure 6: How many stories were used?



Discussion and Future Directions

As library instruction programs grow, it is important to explore what librarians are doing and how they are functioning within the classroom. The intent of this study was to explore the variation of classroom tools and techniques used librarians who were teaching to a set of standardized learning outcomes; however, data analysis revealed new areas for further research.

Before observations were conducted, librarian/study participants were asked to self-report their questioning techniques and classroom priorities through a preliminary survey. As predicted through self-reporting, discussion (oral questioning) was by far the most-used approach by librarians, followed by the use of worksheets. This is consistent with other data collected in the survey showing that librarians perceive discussion as the most effective tool or technique in facilitating active student participation. Regardless of the nature of the questions (inquiry or non-inquiry), this study found that librarians work to facilitate discussion in the classroom, which suggests that the development of discussion-based classroom skills are necessary for librarians. While most questions asked though discussion were librarian-initiated, it is important to note that most student-initiated questions were in response to worksheets. The researchers suspect this indicates that students are taking more

responsibility for understanding expectations related to specific tasks than engaging in abstract concepts. The authors would like to explore this idea in more depth. The result showing that students respond to questions on worksheets and seek clarity suggests there is an opportunity for librarians to design worksheets intended to engage students in critical thought and problem solving; furthermore, this may allow librarian instructors to ask open questions that have more than one answer.

The data illustrate the use of discussion questions and the situation in which scripted and unscripted questions were employed in observed classes. The researchers noted that discussion questions were the most highly used technique in all of our classrooms. Understandably, scripted questions were most used during polling and on worksheets, while unscripted questions were heavily used in oral discussions. Unscripted questioning might allow genuine engagement between teacher and student, but a productive discussion is generally guided and key questions are generally charted by the teacher ahead of time in order to ensure that the group stays on point. During this study, it was clear that some questions were perhaps miscoded as "unscripted" because the question well-integrated into the discussion; the researchers would like to investigate question-delivery in more depth to determine whether some librarian questions that appear "unscripted" are actually intentionally and strategically phrased in order to evoke response and ensure clarity. .In the future, it would be informative to investigate the level of preparation and intentionality in phrasing of initial discussion questions, determine if experience increases or decreases the likelihood of employing scripted discussion questions, and measure their effectiveness of engaging students in strategic thought processes. The authors believe their coding sheet was unable to capture the broader conversation that might have resulted using polling questions. The researchers are curious if librarians are intending one-way communication of information with polling rather than the promotion of dialog, and they want to explore the quality and nature of the questions asked via polling: Were the questions open-ended or closed ended? Finally, do librarians attempt to use polling to facilitate open-ended response (i.e., open response polling), or are polls intentionally designed with multiple-choice or yes/no response only?

Compared to polling and discussions, students initiated more questions on worksheets. Of the 32 classes, students asked at least one question on worksheets in 22 classes, with four or more questions asked in nine of the classes. The researchers found this interesting, because

the perception identified through self-reporting was that questioning through discussion was a more effective method of generating participation. This finding further reinforces the need to explore the motivation behind student-asked questions generated by the use of worksheets.

Librarians also reported through the initial survey that visual aids were the second-most preferred technique for communicating concepts to students, followed by analogy, storytelling, and the use of presentation software (discussion once again ranked first in this list). This study found that visual aid was a broad category, which makes it difficult to determine commonalities between librarians in their use of visual content. Still, the observation of visual aids in instruction suggests librarians are employing accessible design, which the researchers consider important. The researchers believe it would be interesting to further investigate the quality and depth of visual aid material used in the classroom, particularly to assess the nature of using visual aids and how they are being deployed. The authors believe the following questions merit further investigation: Are visual aids simply conveying ideas and information or do they serve a deeper pedagogical purpose such as modeling? Are visual aids being used to foster inquiry?

Conclusion

The researchers believe it would be valuable in a future study to analyze different subsets of storytelling because they suspect librarians are using a higher rate of storytelling within their classrooms than this study was able to capture. It would be particularly informative to use classroom observations to determine how committed librarian teachers are to storytelling, and whether they develop a narrative as they teach in addition to employing analogy when explaining difficult concepts. Future researchers may want to begin with some of the following questions: When librarians engage in storytelling as pedagogy, how do they engage students? Do stories lay the groundwork for conceptual work within the classroom? Do librarians nest stories within discussions? Do they use stories as an introduction to a discussion?

Ultimately, the researchers set out to determine how librarians were engaging students and what techniques they were using to do so, rather than which technique or tools were most effective. What is clear from this study is that the participating librarians rely on oral discussion as a cornerstone for student engagement, and that the use of worksheets tends to

prompt more student questions in the classroom environment. Furthermore, library instructors are using a blend of instructional technology and pedagogical approaches in addition to oral discussion and worksheets. The researchers believe this exploratory study was useful in advancing the conversation about librarians developing skills and techniques within the classroom, and practicing individual teaching approaches while using common learning outcomes. This study also reveals that librarians are using a variety of approaches to reach a common goal, suggesting that they are committed to developing individual teaching practices and skill sets, and that they share ideas but make independent choices within the classroom. In the end, the data shows that librarians are approaching the classroom as teachers who choose their own approach; this may indicate that autonomy is a characteristic of teacher librarians, even as work within a standardized system.

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Appendix: Data Collection Worksheet

EN102 Information Literacy Classroom

Spring 2015

The information on this worksheet is confidential and exists for the purpose of data collection in the above-named study. This worksheet will be used during class observation and will be completed by a designated data collector. Please return this worksheet to Sara Whitver when it is completed.

Observer's Name:

Section 1- Demographics:

Librarian	
Course number and section	
Date	
Time	
Classroom Location	
Duration of Class Period	
Male/Female Ratio in Class	
Assignment Due Date	

Section 2- Types of techniques and teaching aids the librarian utilized in the classroom:

# of times used (hashmarks):

Graphics	
Storytelling	
Analogies	

Section 3- Response Rate to questions asked through techniques and teaching aids (please count by using hash marks)

	Questions asked by polling	*Questions asked through discussion*	*Questions asked by/about worksheet*
Scripted librarian initiated questions answered			
Unscripted/improvised librarian-initiated questions answered			
Student-initiated questions asked			
Student follow up questions asked			
Librarian called on specific student (cold calling)			

Section 4-Pedagogy:

	Periodically throughout class	*At the end of class*
Individual work		
Group work		
*Listen/discuss throughout class and perform task afterwards on their own time		
Does group work include compulsory oral response (i.e. are the members of the group required to report the results of the group's assignment?)		