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Robert L. Moore
robmoorephd@gmail.com

Stephanie J. Blackmon

James Markham

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Making the Connection: Using Mobile Devices and PollEverywhere for Experiential Learning for Adult Students

ROBERT L. MOORE

University of North Carolina Charlotte, USA
rob@mindofaninnovator.com

STEPHANIE J. BLACKMON

William & Mary, USA
sjblackmon@wm.edu

JAMES MARKHAM

University of North Carolina School of Government, USA
markham@sog.unc.edu

Technology integration has significantly influenced the way students access and retain knowledge gained in the classroom (Ahmed, 2016). This is particularly relevant in classrooms for adult learners who engage in continuing education. This paper used a descriptive case study (Yin, 2014) to share how an instructor utilized mobile learning with a web-based polling tool, PollEverywhere, to gamify experiential learning for adult students in various roles within a southeastern state's court administration—prosecutors, defense lawyers, magistrates, and jail administrators—and improve students' engagement in the course and connection to course material.

Introduction

Technology integration has significantly influenced the way students access and retain knowledge gained in the classroom (Ahmed, 2016). As technology becomes more integrated into our everyday lives, it is simultaneously increasingly integrated into classroom environments. However, for technology to be effectively integrated, it is important that it is properly aligned to instructional objectives. Thus, technology is most effective when it improves not only the quality of instruction, but the communication between learners and the instructor. As Elmas and Geban (2012) suggested, one of the ways to engender this type of interaction is through the use of Web 2.0 tools. Web 2.0 tools allow users to be both content creators and content consumers. This type of collaboration can be found in several tools, from wikis to social media. These tools are currently being integrated into higher education settings via personal devices, specifically smartphones (Ahmed, 2016; Aljaloud, Gromik, Billingsley, & Kwan, 2015; Lucas, Gunawardena, & Moreira, 2014; Pereira et al., 2016). One such Web 2.0 tool is PollEverywhere, a web-based polling and survey application. This application allows for responses to be submitted via a web browser or a smartphone. What makes PollEverywhere different from other response systems, such as TurningPoint, are the variety of question and response types ranging from open ended to clickable images. This variety of question and response types moves the use of this tool from being a simple multiple-choice response (a limitation of TurningPoint) to the more collaborative type of response indicative of Web 2.0 tools.

The instructor for this study previously used TurningPoint in his courses, but found the limitations of TurningPoint (e.g. only being able to do multiple choice questions and only being able to present results as bar charts) too limiting for his instructional needs. He was interested in finding a tool that allowed more flexibility with not only how he posed questions, but also in how students responded. This study outlines how he transitioned his instruction from TurningPoint to the more flexible PollEverywhere. This study used Kolb's Experiential Learning Cycle (ELC)'s four phases of concrete experience, reflective observation, abstract conceptualizing, and active experimentation (Kolb, 1984, 2015).

BACKGROUND LITERATURE

Mobile Learning

Mobile learning, also known as m-Learning (Alexander, 2004), has been celebrated for its associations with flexibility and connectivity in higher education classrooms (Al-Emran, Elsherif, & Shaalan, 2016). m-Learning has also been affiliated with the bring your own device (BYOD) movement, where students bring their own tablets, smartphones, and other Internet-capable devices to class, and instructors integrate the devices into courses to encourage and support learning (Johnson, Adams Becker, Estrada, & Freeman, 2015). Studies suggest that students report benefits when using mobile devices for learning. For example, students in Gikas and Grant's (2013) study noted that using their mobile devices for learning allowed them faster accessibility to information, more ways to collaborate with others in the course as well as communities outside of the course, and opportunities to learn more even when class was not in session. There were some challenges as well, however. Students mentioned "anti-technology instructors" who seemed negative about technology use in classrooms and problems with various mobile applications not working as well as they should (Gikas & Grant, 2013, p. 23). Although students considered several reasons why some instructors would prohibit technology use in courses, such as a professor's unfamiliarity with certain technologies or generational differences of opinion about technology use in classrooms, they admitted that the mixed messages were confusing at times (Al-Emran, Elsherif, & Shaalan, 2016; Briz-Ponce, Pereira, Carvalho, Juanes-Méndez, & García-Peñalvo, 2017; Gikas & Grant, 2013; Ma, Steger, Doolittle, & Stewart, 2018; Song & Kong, 2017). Johnson et al. (2015) suggest that students often feel pressure to own the newest mobile device, and that at times, classrooms cannot support various mobile tools because of infrastructure restrictions (e.g. the application requires iOS devices). Many researchers and practitioners have subsequently explored creative solutions to these BYOD mobile challenges (Johnson et al., 2015).

Student Response Systems

One application that can be used on mobile devices is a student response system, or SRS. Extant literature uses the terms student response systems (SRSs) and audience response systems (ARSs) interchangeably (Aljaloud et al., 2015), and this manuscript will use SRS for simplicity.

These terms refer to any type of system that allows students to use their personal device to respond in real-time to questions posed by an instructor. One of the key benefits of SRS is the ability to create an active learning environment that allows interaction between students and the instructor in a dynamic way not possible without the use of technology (Aljaloud et al., 2015; Shon & Smith, 2011). This interaction, facilitated through real-time polling, increases engagement and better integrates students into the learning process (Powell, Straub, Rodriguez, & VanHorn, 2011; Stover, Patitu, & DuVivier, 2016). The most engaging feature of SRSs is the real-time results display that allows students to see results as they are incoming from various devices (Shon & Smith, 2011; Steinke & Bryan, 2014; Stover et al., 2016), which previous research suggests creates an interactive learning environment (e.g., Bojinova & Oigara, 2011; Ferrándiz, Puentes, Moreno, & Flores, 2016; Johnson & Lillis, 2010). Besides creating a more engaging environment for students, the use of SRSs also provides benefits for the instructor, specifically with the feedback process (Aljaloud et al., 2015; Ferrándiz et al., 2016). In their research, Titman and Lancaster (2011) argue that utilization of an SRS led to a significant pedagogical improvement, as students were able to share their thoughts and receive instant feedback from the instructor.

Types of SRSs

Not all SRSs are created equal. One of the earlier categories of SRS is referred to as ‘clickers.’ In order to use clickers, students needed to purchase a physical device that allowed for a connection to the instructor’s presentation. While the real-time polling component was there, so were barriers for successful use resulting from students having to purchase a specific device. In higher education, clickers struggled to get consistent buy-in across instructors. It was not uncommon to have multiple instructors within the same school using different clicker systems, which added costs to the students. Another challenge was instructors using the clickers without considering the pedagogical connections and implications. One example is a large lecture class requiring students to bring clickers and the instructor using it as an attendance tracker; to the students, this could seem like an overly cumbersome (and financial) burden and an inauspicious use of technology. As the use of SRSs has evolved, smartphones have been identified as a more cost-effective way to integrate SRSs into the classroom (Aljaloud et al., 2015; Shon & Smith, 2011). In this descriptive case study (Yin, 2014), we

explored how an adult educator utilized mobile learning with a web-based polling tool, PollEverywhere, to gamify experiential learning for adult students in various roles within a southeast state's court administration—prosecutors, defense lawyers, magistrates, and jail administrators—and improve students' engagement in the course and connection to course material. In addition to the benefits of leveraging the students' own devices, we shared feedback from both the students and the instructor that showed how the overall instruction was improved resulting from the use of an SRS through m-Learning.

Gamification and SRS

The use of mobile SRSs has been shown to increase engagement and student performance (Al-Emran et al., 2016; Ma et al., 2018; Song & Kong, 2017). The elements of fun created through an SRS can be explained as gamification, a growing phenomenon in educational settings (Furdu, Tomozei, & Köse, 2017; Pelling, 2011; Pereira et al., 2016). Gamification is based on the idea that playful environments allow participants to acquire skills that can be easily transferred and used in more sophisticated settings that require superior levels of knowledge (Pereira et al., 2016). Specifically, incorporating SRSs into the classroom can be seen as a gamification technique to engage students in active learning (Beekes, 2006). The benefits of gamification with an SRS are similar to the benefits of SRSs in general, specifically increased student engagement (Pereira et al., 2016). There are, however, challenges associated with gamification. While the data on the results of gamification in higher education are mixed—showing everything from less improvement or no improvement, to improvement in some areas but not others when used with badges and trophies for course task completion—the combination of gamification, mobile technology, and experiential learning can yield positive results for adult learners (Domínguez et al., 2013; Hanus & Fox, 2015).

PollEverywhere

PollEverywhere is a web-based SRS application that has capabilities similar to those associated with clickers, but allows students to utilize mobile and other personal devices to respond to content (Kappers & Cutler, 2015; Shon & Smith, 2011). Tools such as PollEverywhere can foster

more meaningful discussions with students because of the anonymity of the responses (Beekes, 2006; Micheletto, 2011). Kappers and Cutler (2015) studied the use of PollEverywhere in a large introductory computer science course and found that overall, the students enjoyed the use of PollEverywhere and felt more engaged with open-ended questions versus the traditional multiple-choice questions. The ability to quickly assess students' understanding of concepts in an interactive way made PollEverywhere an attractive tool for the adult educator in the current case study.

The instructor has previously used TurningPoint, a clicker response system where students use clicker pads to respond to multiple choice questions. To explore the utility and functionality of PollEverywhere, the instructor reconceptualized the content to make use of different question types with PollEverywhere. He was interested in getting more nuanced responses to questions such as using a timeline so that students could visually see where their own decisions aligned with their peers. The polling questions were created in the PollEverywhere web-based application, and the slides were then integrated into his existing PowerPoint presentation. For each question, students were asked to use their own devices to respond to the different questions. The instructor was able to control how and when responses were displayed and use the information to guide the discussion in the classroom.

Theoretical Framework

Kolb's Experiential Learning Cycle or ELC (Figure 1; Kolb, 1984, 2015) served as the theoretical framework for this study. Stover, Patitu, and DuVivier (2016) outline the use of Kolb's ELC as allowing students to have an engaged learning environment. In the first stage, concrete experience, learners are presented problem sets or participate in simulations. In the second phase, reflective observation, learners are asked to consider the what, why, and the how of a situation, which is achieved through discussions, brainstorming, and formative feedback from the instructor. In the third phase, the learners move into conceptual understanding and grapple with questions focused on what things mean. This phase is supported through the completion of projects situated in theoretical models. Finally, in the fourth phase, the learners demonstrate their transfer of knowledge through the completion of simulations or case studies that merge their previous three phases. In addition to using the ELC to frame the approach to the current study, the researchers also employed the ELC to frame the findings for the study, as the instructor used the framework to guide course activities.



Figure 1. Kolb's Experiential Learning Cycle (Kolb, 1984, 2015).

Methodology and Context

The current descriptive case study is bounded by its focus on one instructor's experience with an adult education course for state officials at a higher education institution in the southeastern United States. According to Yin (2014), the descriptive case study's purpose "is to describe a phenomenon (the 'case') in its real-world context" (p. 238). In the current case, the researchers described the phenomenon of increased student engagement through the instructor's integration of mobile learning and a web-based SRS into an adult learning course. Data for the current study included participant evaluations (with quantitative and qualitative data), the instructor's observations during each iteration of the course, as well as the instructor's reflections after each course. These various data points, particularly the student data combined with the instructor data, also served as a data reliability measure. Yin (2014) discussed four strategies for data analysis, one of which the authors employed in the current study: a descriptive framework. The descriptive framework can be used for a "descriptive approach," and can include qualitative and quantitative data (Yin, 2014, p. 140). The researchers

also used the “pattern matching” technique, as the findings were matched to engagement, as well as Kolb’s ELC, and the “logic model technique,” which is “another form of pattern matching” (Kolb 1984, 2015; Stover et. al, 2016; Yin, 2014, p. 143, 155). The “intervention” was the integration of Pol-LEverywhere via m-Learning, the “immediate outcome” was that students could use their own devices to participate and help guide aspects of the course, the “intermediate outcome” was that student engagement increased, and the “ultimate outcome” was improved understanding of course material and interaction with each other and the professor (Yin, 2014, p. 156).

The institution for this case is unique for several reasons. For one, while it is situated within a university, the students were not undergraduate students; instead, they were state and local government officials. The institution is divided into several functional groups based on their clients served: a local government group, which works with those in positions such as city and county managers, clerks, commissioners; a public leadership group, which focuses its work on those in elected positions; and a courts group, which focuses on those in court administration such as judges, magistrates, and prosecutors. This study focused on the third group. Besides having a unique student population, this institution also approaches its educational and teaching offerings in a nontraditional way. While many are more familiar with the traditional Monday through Friday structure of academic courses, this institution, instead, uses a format more commonly found in professional development instruction where the courses are session-based either in one-day or multiple-day offerings. It is this course structure that has a significant impact on both the implementation and use of technology in these sessions. The student population ranges in both age and experience, and it is quite possible to have within the same class students with education levels ranging from no high school to a master’s in public administration. This type of variance is most often found in the local government courses and less with the courts group due to academic requirements, such as having a law degree, for many of the positions within the targeted student population. However, in this group, there can exist a wide variance in both experience and age, which impacts technology use. Another challenge unique to this institution is that course sessions are typically short, leaving little time to create rapport. For many of the students, they are attending the session to get a specific bit of information that has a direct impact on their work environment. They are only in the course for anywhere from an hour to a few days, so it is critical that they can get the information in the most effective and efficient way possible.

The instructor in this case study works in the courts group and provides instruction to various levels of the state’s court administration officials. As

briefly explained, this instructor was tasked with creating a learning environment that can efficiently convey the necessary information to these administration officials. This case study discussed how the instructor taught sentencing and probation topics to different sessions made up of prosecutors and defense lawyers, magistrates, and jail administrators. As there is annual turnover for court administrators, the instructor offers the same material each year. Some of these courses are part of programs hosted at his institution (e.g. new prosecutors and new defense lawyers), and other sessions of these courses are delivered at annual conferences organized by the administration offices (e.g. magistrates and jail administrators). The sessions for prosecutors and defense lawyers were each attended by approximately 60 lawyers. The session for magistrates included approximately 150 magistrates, and the session for jail administrators included about 50 jail administrators, sheriffs, and detention officers. The instructor made use of multiple choice, free-text responses, and spatial exercises, all created with PollEverywhere and accessed via participants' mobile devices. PollEverywhere gave the instructor the ability to get real-time feedback on the course, but more importantly identify where there were knowledge gaps or areas that needed additional exploration. He was also able to observe a more engaged class, as they used the PollEverywhere polls, which increased engagement and was reflected in the course evaluations from the new prosecutors and defense lawyer training sessions. As the instructor regularly provides the same content, but was looking for ways to better deliver and engage the class -- the experiences with PollEverywhere have encouraged him to further integrate it into his other course offerings.

FINDINGS

New Prosecutors and Defense Lawyers

The instructor has taught a session on sentencing and probation to new prosecutors and defense lawyers for the last five years. He co-teaches this client group with several other faculty members and generally has about two hours within a larger program to focus on his topic. In the 2016 course offerings, he taught 46 new prosecutors and 35 new defense lawyers. While his course evaluations from the new defense lawyers were higher than the new prosecutors (Table 1), both evaluations had comments about wanting to spend more time with the content and a greater focus on sentencing.

Table 1
 Course evaluations from 2016 offerings of new prosecutors and new defense lawyers. Numbers shown are means (0-5).

	New Prosecutors (n = 45)	New Defense Lawyers (n = 12)
The instructor presented the material clearly	4.63	5.00
The instructor was knowledgeable and well-prepared	4.79	5.00
The instructor's pace was appropriate	4.44	4.92
The session content is important for my professional development	4.70	4.85
Overall, the session was skillfully done	4.53	4.92
Average	4.62	4.94

The evaluations show that students felt the instructor did a good job in presenting the information. However, the instructor felt there were opportunities to provide more engagement and opportunities for the students to demonstrate and apply the sentencing scenarios. He was also interested in having the students engage more with each other on their own best practices. While students were participating in the TurningPoint polls, the instructor was concerned there was a 'silent minority' where students were following along with what their peers were answering and those with issues or areas of concern were not having their needs met. He had this concern based on his personal observations of students during the polling questions and how engaged they appeared to be. In his work, he also receives questions from clients after class, and the types of questions that he was getting from clients indicated that there may have been some lack of full understanding during the class. The instructor sought ways to have more robust classroom discussions, allow for more variations and types of polling questions, and ways to give voice to this 'silent minority.' Together, the authors did a literature review of relevant theories to find ideas and found that Kolb's learning cycle could be applied to this study. In their review of this theory, it seemed to be a good fit to solve the aforementioned challenges the instructor was experiencing.

They decided to integrate Kolb’s ELC by leveraging the use of participants’ mobile devices and using PollEverywhere in the next iteration of these sessions. The intent was to replace the multiple-choice TurningPoint questions with a variety of PollEverywhere question types, such as open ended, clickable images, and multiple-choice questions. The instructor wanted to still maintain high student satisfaction regarding covering the necessary material but wanted to see if PollEverywhere would improve the in-class discussion and post-class application to practice. Peer instructors have expressed concern with relying on a BYOD type of polling versus Turning-Point where pads are provided to each participant. The instructor was also interested in testing out the assumption that students in this client group would not want to use their own devices during instruction. PollEverywhere provided the type of flexibility and interaction that the instructor desired. The content and length of presentation remained the same between the two iterations, but the next offering would have PollEverywhere polls embedded into various sections of the PowerPoint presentation. To prepare the students for using their own devices, the instructor added an introductory slide with instructions for how to access the polls.

After the instructor identified possible places to integrate polls, there was a second meeting with the instructional designer to discuss how PollEverywhere could be utilized. The 2017 iterations had 53 new prosecutors and 56 new defense lawyers (Table 2).

Table 2

Course evaluations comparing 2016 and 2017 course offerings for new prosecutors and new defense lawyers. Numbers shown are means (0-5)

	New Prosecutors		New Defense Lawyers	
	2016 (n = 45)	2017 (n = 52)	2016 (n = 12)	2017 (n = 28)
The instructor presented the material clearly	4.63	4.90	5.00	4.96
The instructor was knowledgeable and well-prepared	4.79	4.92	5.00	5.00
The instructor’s pace was appropriate	4.44	4.92	4.92	4.93

Table 2 continued

	New Prosecutors		New Defense Lawyers	
The session content is important for my professional development	4.70	4.81	4.85	4.93
Overall, the session was skillfully done	4.53	4.90	4.92	4.96
Average	4.62	4.89	4.94	4.96

At the institution for this study, TurningPoint has been the SRS. The institution purchased physical pads to ensure each student had a pad and could participate in the polling. Concerns that students will not have mobile devices or a technical ability to use them has created a level of resistance and apprehension with transitioning to a web-based tool such as PollEverywhere. In staying with TurningPoint, the instructors have limited their polling options, but ensured high student participation. As Table 2 demonstrates, these assumptions about students not having devices or having challenges using their own devices may not be as applicable as once thought. The fact that numbers are fairly similar between the two years shows PollEverywhere did not have an adverse impact on the ability for students to participate in the class discussions. In fact, in most cases, the levels of satisfaction went up between the 2016 and 2017 iterations, and the overall average satisfaction was higher for both 2017 sessions. This improvement in scores was particularly evident with the new prosecutors. With this client group, the evaluations suggest the use of PollEverywhere had the most significant impact, and the evaluations between the two courses are nearly identical. Additionally, course participants remarked in their evaluations about how much they enjoyed the interactive nature of the course, that they have a greater confidence in the material now, and how the polling made the topic seem more interesting. For example, one participant from the new defense lawyers' session stated the material was "presented in a clear and fun way." A participant from the new prosecutor' session remarked that he or she, "loved the interactive portion" of the session. The instructor also observed a more robust discussion and more engaged students in the second iteration.

Integration of ELC into the Classroom

The instructor for this case study incorporated Kolb's ELC to frame his approach to the course and content and employed mobile devices and

PollEverywhere to gamify aspects of the course content delivery (Deterding, Dixon, Khaled, & Nacke, 2011). Students participated using their own devices and submitted answers anonymously, improving student participation particularly when the topics were sensitive or of a confidential nature (Beekes, 2006). The use of the polls not only engaged students, but also provided formative feedback that informed the instructor's pace and direction for the sessions.

Concrete Experience

This first stage of the ELC model is concrete experience, which students engage in when they have direct experience-based approaches to learning (Stover et al., 2016). An example of this would be the use of problem sets or simulations. In the sessions with lawyers and magistrates, the instructor was interested in gaining greater insight into their knowledge of concepts he was teaching so the adult learners could connect these concepts to their professional contexts. One of experiential learning's key components is instruction based on real-world experiences, so there was a unique opportunity in using experiential learning to foster adult learning (Wurdinger & Carlson, 2010). Furthermore, merging experiential learning with technology in the classroom can lead to an effective transfer of learning, which is the purpose of many classes (Czaja & Sharit, 2013). To enhance the connection between the course material and learners' experiences, the instructor gamified the lesson by creating a scenario and designing an activity for the scenario using PollEverywhere. He presented a slide that showed a fictional person's criminal history score, called "prior record level," and then a PollEverywhere interaction with a multiple choice question that asked students to identify the defendant's prior record level (Figure 2); students accessed the poll using their mobile devices. This application of concepts required the students to use a sentencing chart to find the correct answer and then submit their answer. The anonymity of the responses ensured that he had 100% participation from students and allowed them to share their answers without fear of penalty or embarrassment for incorrect responses. Additionally, PollEverywhere displays the results in aggregate form, allowing for a richer post-quiz discussion.

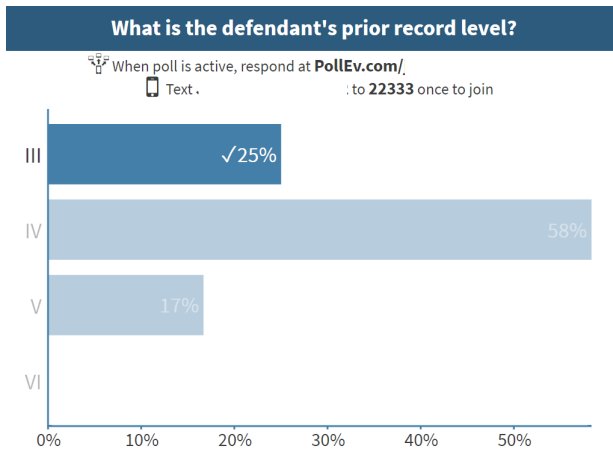


Figure 2. Example of multiple-choice PollEverywhere poll with a displayed correct answer.

As Figure 2 indicates, 25% of students selected the correct answer. Without the use of mobile devices, combined with a game-based approach to SRS use for the lesson, several students would have provided the wrong answer aloud or may not have responded at all, which could have had negative implications for student confidence and future participation. Additionally, this poll quickly gave formative feedback for the instructor about where each course participant's current level of understanding was.

Reflective Observation

The second stage of the ELC model is reflective observation, which occurs when learners make observations and reflections and ask questions such as what, why, and how (Stover et al., 2016). Examples of this stage include participation in discussions, engagement in brainstorming sessions, and receiving formative feedback from experts and instructors. It is at this stage that the integration of SRS can have a significant impact. Specifically, SRS improves the process of instructor feedback since the instructor has more information about the learning processes of their students (Bojinova & Oigara, 2011; Ferrándiz et al., 2016). This is because SRS allows the instructor to dynamically redesign the lecture to focus on the topics about which students had the most misconceptions (Habel & Stubbs, 2014). The

use of PollEverywhere gave the instructor opportunities to not only assess the students' knowledge levels, but also inform the direction of the course. An example, shown in Figure 3, allowed the instructor to do a pre-test of the jail administrators group.



Figure 3. Example of multiple-choice PollEverywhere poll used as a pre-test.

After receiving the poll results, the instructor saw that relatively few administrators were fully satisfied with the status of their program, and that created an environment where the group was eager to learn and work together. The ability to quickly receive responses through the use of mobile devices and share these responses with the students allowed for a rich discussion, benefitting both the instructor and students. The pretest-style questions and self-assessment polls helped the instructor identify a quiet majority of participants who welcomed a more basic treatment of the subject matter. Additionally, when students struggled with a question, polls helped justify the repetition of the content. Instead of simply having content and using informal polling—e.g., a show of hands, asking for volunteers—the instructor integrated the questions within the overall structure of the presentation and allowed students to share their thoughts and opinions anonymously through their own devices.

In another example of the use of PollEverywhere, the instructor used the discourses question type to help guide the discussion, as shown in Fig-

ure 4. In this example, the instructor asked the students to share their most common grievances -- students could indicate their level of agreement (a vote up or down) for previously submitted answers. This real-time interactivity not only helped engage the learners, but also gave immediate insight to the instructor on the most common issues. Another benefit of this question type is that it allowed for a grouping of common thoughts and experiences among the students. The visualization of these overlaps was helpful not only for the students, but also the instructor in guiding the class discussion.

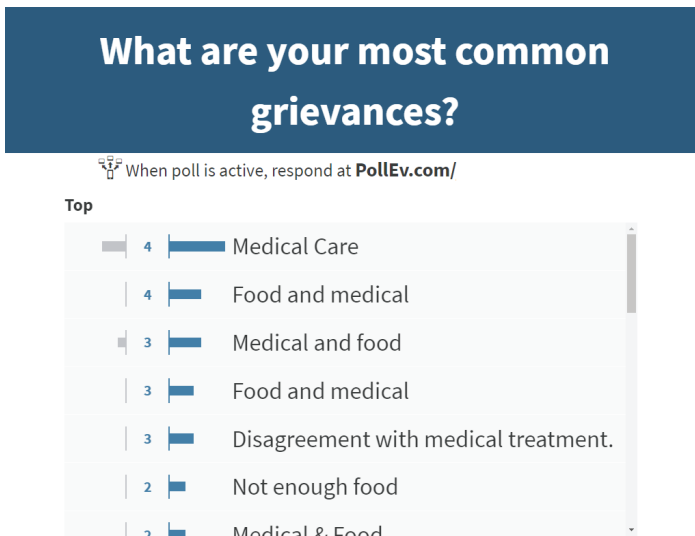


Figure 4. Example of discourse PollEverywhere question type.

Abstract Conceptualizing

The third stage of the ELC is abstract conceptualizing and is demonstrated when learners gain a conceptual understanding and ask questions about what things mean (Stover et al., 2016). A typical example would ask students to write a paper or complete a project using a theoretical model. For the current case study, this stage was demonstrated in an innovative way using PollEverywhere. One of the more impactful uses of PollEverywhere with the lawyer and magistrate groups was a spatial exercise where participants tapped the screen to show at what point during a sentence they

believed an inmate should be released from prison (Figure 5). The large variability in responses helped establish early on that participants had a somewhat infirm grasp of one or more fundamental concepts of their state's felony sentencing law, a key component of the learners' real-world contexts. The instructor found identifying that knowledge gap early in a session justified spending more time on practical applications of the sentencing law. By executing the spatial exercise, the instructor gave students a different way to demonstrate their understanding by moving the students from merely answering typical multiple-choice questions to improving their connections to the course content and enhancing their engagement in the course, as their input shaped the direction of the class. Access to this form of gamification is one of the benefits of mobile learning. Students can use their own devices to connect to each other and the course material in meaningful ways. By linking this question and the answering mechanism to a spatial timeline provided by the SRS (Figure 5), then connecting those to the specific sentencing charts that the officials will use in the real-world sentencing environments, the instructor was able to leverage m-Learning and utilize gamification to allow learners to develop and acquire easily transferable skills that they can use in their real-world situations at a more advanced level (Pereira et al., 2016).

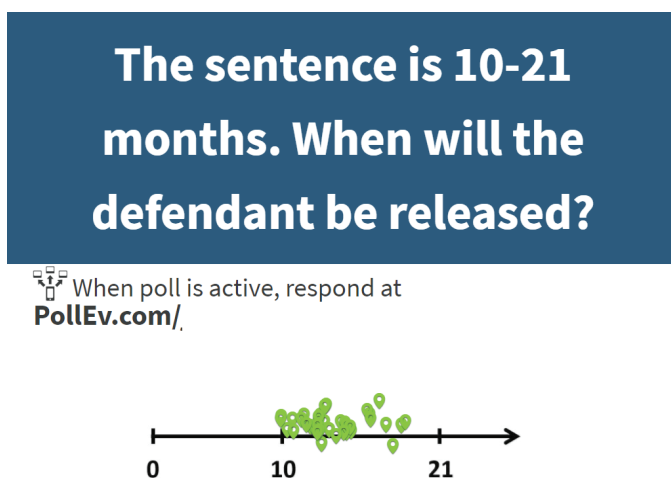


Figure 5. Example of clickable PollEverywhere question type.

Active Experimentation

In the fourth and final stage of the ELC model, active experimentation, learners translate their experience, reflection, and conceptual knowledge into action (Stover et al., 2016). This can be done with simulations, case studies and field work, and transfer of knowledge. An SRS is able to support this stage by providing a mechanism through which students evaluate their own performance and identify areas for improvement, then take steps to improve their academic performance (Aljaloud et al., 2015; Bojinova & Oigara, 2011; Johnson & Lillis, 2010). With the jail administrators, the instructor used PollEverywhere much more frequently. The subject of the session was on inmate disciplinary procedures—a topic on which there is little statutory or regulatory guidance. Given the absence of controlling law, the session was focused on helping participants learn from one another on how they structure their inmate disciplinary process. As Knowles, Holton, and Swanson (2015) explained, adult learners have invaluable life experiences that can improve the in-class learning environment, and an adult educator who can incorporate these experiences within the lesson will be most effective. Thus, it is imperative for adult educators to identify ways to establish meaningful connections between what adult students learn in the class session and how that will directly apply to their real-world situations (Clair, 2015). Through m-Learning, PollEverywhere was used to draw out, among other things, who at the jail handles disciplinary proceedings, what the most common infractions are, who handles appeals, and what sanctions inmates typically face for violations. These questions generated a robust discussion of best practices and lessons learned and created an opportunity for students to connect with course content in ways that held real-world implications (Figure 6).

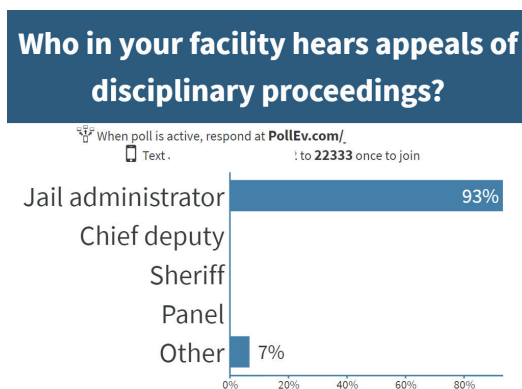


Figure 6. Example of multiple-choice PollEverywhere poll being used as discussion starter.

To start the session, the instructor designed the initial questions as ice breakers to gauge the learners' perspectives on their current administrative programs. Some of the PollEverywhere questions were designed to gather information about how each jail structures its inmate disciplinary program. The answer choices were the instructor's best guesses about how jails (which range in size in that state from 12 beds in a small western county to over 2,000 in a large city) might approach the issue at hand.

However, initial responses from the students quickly showed the instructor he had made some bad assumptions, allowing him to dig deeper to get input from participants who structured their program in a way he had not anticipated. Once participants knew they were not "alone" in setting things up differently, they were more forthcoming with details about their approaches. To further generate discussions, the instructor used free text response questions. Some of these replies quickly captured the most pressing issues the jails are facing. The similar answers allowed students to see their connections with others in the course and immediately directed the group to what were obviously their biggest challenges. When answers were not quite so repetitive, the ability to vote selections up or down gave the class a chance to highlight common practices at a glance. This allowed the instructor to focus on the most pressing issues; if time allowed, he would discuss the items that had been voted down. However, from the instructor's perspective, it also helped give him more real-life context—areas that he may have thought were higher interests were voted down—which contributed to making the overall course more engaging and relevant for the learners.

Discussion

Although case studies are not designed to be generalizable, there are several considerations that the current study provided for other instructors who are similarly situated. For example, the unique circumstances the instructor experienced made the issue of engagement a more immediate one, as he only had a limited amount of time with students--not several weeks or months. The use of PollEverywhere via m-Learning helped improve engagement in the course and paired well with Kolb's ELC. A limitation of the current descriptive case is that it did not include in-depth interview data from participants. However, future studies could include interviews with participants before and after the course to gain more in-depth responses to questions on m-Learning, an SRS, and student engagement.

Implications

An underlying assumption at this institution has been the client group does not have mobile devices or will find a tool such as PollEverywhere too confusing to navigate. This study has provided evidence that both of these assumptions may be flawed. More importantly, it also showed that not only will students use their own devices, but they also enjoy the type of interactive and dynamic options that are offered by PollEverywhere. This has significant implications on other instructional activities at the institution because of the question options offered by PollEverywhere. It also will encourage the instructors to consider the most effective use of technology to support their instruction (Song & Kong, 2017).

Application to other contexts

The institution provides instruction to nearly 10,000 local government officials in all branches of government each year. About half of the instructors are relying on TurningPoint and a smaller percentage have been experimenting with PollEverywhere, with the instructor for this study being one of the early adopters. The successes of this instructor have been presented to the rest of the faculty through several lunch and learn events. As other faculty have heard about the ease of use, the increased engagement with the students, and overall satisfaction with the tool, more have expressed interest in using PollEverywhere in their own courses.

One new application other faculty have expressed an interest in exploring is around segmentation. Using the segmentation feature in PollEverywhere allows for more nuanced display of results. For example, an instructor has a group of county managers from across the state. These jurisdictions might range in population size from 150 to 25,000. The instructor could have a poll question that breaks those jurisdiction sizes into a small, medium, large, very large category, and ask the students to indicate how they would classify their jurisdiction. Next, the instructor might present a multiple-choice question that asks their biggest challenge (e.g. coordinating open meetings, managing their budget, maintaining roads, etc). PollEverywhere would then be able to display the breakdown by jurisdiction and problem, showing possible trends (e.g. small and medium jurisdictions struggle the most with maintaining roads while larger jurisdictions struggle most with managing their budget). From here, the class could discuss what these differences mean in how they govern and possible ways to address these concerns. It would also allow for a discussion of the differences in jurisdiction and governance. This is just one example of the various ways PollEverywhere can be used to foster discussion in a more dynamic way than simple multiple-choice questions.

ELC as conceptual framework

ELC is a useful conceptual framework for this type of experiential learning as it emphasizes the different aspects that instructors need to consider. By using the four steps as guiding principles, it can help instructors identify ways their polling can be delivered to foster communication and collaboration. As instructors are looking for ways to engage students beyond the mundane multiple-choice options, ELC can help them re-conceptualize how they deliver their instruction. When viewing his course content through the lens of ELC, the instructor in this study saw there were ways to create more enriching activities.

Conclusion

The elements of SRS use and gamification would not have been possible without the integration of mobile learning into this adult education course. Students had access to their own devices, so when elements of the SRS were gamified, they did not have the added pressure of having to learn

a new device or system. Although m-Learning may have its challenges, the current work described how the combination of mobile devices and an SRS, with a bit of gamification, can provide a positive learning environment for adult students.

The four stages of Kolb's ELC model provided a useful conceptual framework for this study. The stages of concrete experience, reflective observation, abstract conceptualization and active experimentation allowed the instructor to think of a sequential and incremental approach in his instruction that connected well to PollEverywhere polling options. For instance, being able to ask for students to answer a specific question about a defendant's prior record level, and get immediate feedback on the correct answer, was practical at the first stage of concrete experience. Additionally, it quickly provided the instructor a sense of where the level of understanding was for the class and where possible areas of confusion might be (e.g. why they would have selected a level 1 or 2 when the correct answer was level 3). The sequential nature of the model was also useful in helping the instructor work through the level of progression to use; he did not need to have everything at the fourth stage (active experimentation), but could build towards that with the students and based on their input and feedback.

This case study specifically explored the use of PollEverywhere with judicial officials and focused on sentencing type decisions. There are other SRSs and instructional contexts that should be explored, such as with local government officials learning about topics from water treatment to ethical decision-making, and this case study only scratched the surface of the how a SRS can be integrated into a course as there are a variety of question types and formats.

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