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Integrating Mobile Devices into the Classroom: A Qualitative Case Study of a Faculty Learning Community

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Abstract

Despite the pedagogic affordances of mobile devices, many instructors are not prepared to effectively integrate them into their courses. “Western State University” has developed a program to support faculty in the innovative use of mobile devices in the classroom. This qualitative case study documents instructors’ experiences and perceptions of integrating mobile devices in their courses. Themes under investigation were the impact of mobile devices on teaching practice, student learning, and course learning outcomes. Results indicate that instructors used mobile devices to create content, communicate, store, and share information. Assignments were modified to take advantage of mobile devices, digital fluency was increased, and assessment strategies were altered. Instructors reported an increase in students’ digital fluency, communication, and active learning. Perceived impact on course learning outcomes, though, was mixed. Implications of this study are discussed, including recommendations for faculty development and ideas for instructional integration of mobile devices.

Keywords: mobile learning; mobile devices; digital fluency; faculty development; technology integration; student learning; instructor perceptions; impact of mobile devices; qualitative case study; integrating mobile devices; perceived student gains; impact on learning outcomes; faculty learning community; iPads; social presence.

1 Introduction

Mobile phones have been around for decades. However, for most of that time, mobile phones were simply used to make phone calls and send text messages (i.e., SMS) and therefore did not drastically change the way people lived and learned. This all began to change, though, with the rise of “smartphones,” which connected to the Internet and ran specialized applications. Today, smartphones are used to build social relations (Park and Lee, 2012), learn at a distance (Vazquez-Cano, 2014), collect home-care records (Vranfield et al., 2014) and even monitor one’s diet (Wharton et al., 2014). Despite the near ubiquity of smartphones today, they are still relatively new. The first iPhone was not released until 2007 and despite the initial excitement, early smartphones were still limited in many ways. It was not until the second and third generations of smartphones and in particular the emergence of tablets like the iPad around 2010 that the true potential of mobile devices and mobile computing began to capture the hearts and minds of people everywhere. In 2013, the Pew Research Center reported that 55% of Americans (16 years and older) own a smartphone and that 35% own tablet computers (Rainie and Smith, 2013).

Noticing the increased use and overall potential of mobile devices, educators began experimenting with ways to integrate mobile devices and mobile computing into the classroom (Bravo et al., 2005; Grace-Martin and Gay, 2001; Shih and Mills, 2007; Swan et al., 2005) at both the higher education and the K-12 levels (Grant and Barbour, 2013). For instance, Basoglu and Akdemir (2010) found that mobile devices could help English as a second language students learn vocabulary. Gikas and Grant (2013), on the other hand, found that mobile devices could create opportunities for collaboration, engagement in content creation, and communication. Bidin and Ziden (2013) focused their research on the potential of mobile devices to provide educators instant access to information, while Martin and Ertzberger (2013), highlighted the ability for teachers and students to locate, measure, and capture data in the field while still being socially connected with others. Finally, Grant and Gikas (2013) emphasized the ability of mobile devices to connect formal and informal learning opportunities. Researchers though are quick to point that despite the potential of mobile devices, it is important to use them in ways that enhance the learning experience rather than act as a distraction (Kuznekoff and Titsworth, 2013).

Despite the affordances of mobile computing and the increased access of mobile devices, many faculty in colleges and universities are not prepared to effectively integrate mobile devices into their courses. For the most part, faculty in higher education receive little, if any, training on teaching and learning (Boyer, 1990; Stevens, 1988). As such,

many end up teaching how they were taught over the years (Beegle and Coffee, 1991)—which typically does not focus on the effective use of technology (let alone mobile devices) in the classroom. Even the few faculty who are interested in experimenting with new ways of teaching often do not know where to begin. Recognizing this dilemma, our institution (which we will refer to as “Western State University”), like many other institutions, has developed a number of programs to help train, support, change, and ultimately improve how faculty teach with technology. One of these programs was an initiative to support faculty in the innovative use of mobile devices in the classroom. Recognizing the challenges of changing faculty behavior, and especially challenges inherent with integrating any technology into the classroom, we set forth to document instructors’ experiences and perceptions of integrating mobile devices into their courses. In the following paper, we report faculty perceptions of integrating mobile devices into their courses and changes they made in their pedagogical practices as a result of having access to these devices. We conclude with some implications for practice.

2 Background

Recognizing the growing number of mobile devices on campus, the increased capabilities of these devices, and the growing interest of some faculty to begin experimenting with them in the classroom, Western State University implemented the Mobile Learning Scholars program. The Mobile Learning Scholars program (to be henceforth referred to as - mLearning Scholars) began in 2010 to support the exploration and implementation of teaching and learning using mobile learning strategies and devices. The mLearning Scholars program is run through the Instructional Design and Educational Assessment (IDEA) unit, which is part of the Center for Teaching and Learning at Western State University (Shadle et al., 2013). The basic concept behind the mLearning Scholars program from the beginning was to form a cohort of interdisciplinary faculty, provide them and their students with mobile devices, and then to have the faculty regularly meet with each other for training and development and overall peer support, as they experiment with ways of integrating mobile devices into their courses. Originally the mLearning Scholars program was designed to last only one semester. The initial group of participants, however, suggested that a single semester was not sufficient to fully explore the opportunities presented by mobile learning (Shadle et.al., 2013); henceforth, the mLearning Scholars program has taken place over fall and spring semesters, with faculty meeting bi-weekly to discuss and share with other cohort members their mobile-device integration experiences.

The program currently forms three cohorts, belonging to the levels 1.0, 2.0, and 3.0. The 1.0 cohort usually consists of faculty who are in the initial stages of exploring the use of mobile learning strategies and devices for teaching and learning. The 2.0 cohort consists of faculty who have some experience with using mobile learning strategies and mobile devices in the classroom but are returning to learn more and to share more about what they have learned integrating mobile devices into their courses. The 3.0 cohort consists of faculty who want to investigate and broadly share the pedagogical implications of using mobile devices in their courses by participating in formal research studies.

At the beginning of each semester, three cohorts of full time and adjunct faculty are selected via an application process to participate in the mLearning Scholars program. To be considered for the program, applicants must submit a written proposal (i.e., submitted via a Google Form). In this written proposal, applicants must state how they plan to integrate mobile devices into their classroom. There are also slightly different questions for each level (i.e., cohort levels 1.0, 2.0, and 3.0); see Figure 1 for an example of the types of questions applicants must answer.

Figure 1 Types of questions included in the mLearning Scholars program application.

<p>1.0 Level Application Questions:</p> <ul style="list-style-type: none">• Previous experience using mobile devices and other educational technology.• Expectations on how the cohort model will support exploration of mobile learning.• Pedagogical challenges that will be addressed while participating in the cohort.• Ways in which the use of the mobile device will help achieve course objectives.• Plans for sharing learning from this cohort with a broader audience. <p>2.0 Level Application Questions:</p> <ul style="list-style-type: none">• Identification of mobile learning strategies (student engagement, communication, collaboration, productivity), which would be the focus of learning that semester.• Ideas on designing mobile activities and curriculum that will support instructional goals.• Identification of anticipated challenges to teaching, designing curriculum, and learning with mobile devices and how the cohort may best support in overcoming these. <p>3.0 Level Application Questions:</p> <ul style="list-style-type: none">• A research plan to investigate the impact of using mobile learning and devices on teaching and learning.
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Applicants for the mLearning Scholars program come from all disciplines and each faculty member has plans to do very different things with mobile technology in their classes. For instance, the following are some examples of how instructors proposed using mobile learning and devices from past proposals:

- A German language instructor who wanted to center her class around the use of an iBook, hoped to receive training on e-textbook applications, which could help her to create class content.
- An Educational Technology instructor who wanted to investigate mobile teaching in online courses. He was interested in how instructors can use mobile devices to teach while away from the office or home (e.g., over the summer or during a conference).
- An instructor who taught pre-service teachers wanted to know more ways in which the iPad can be used to bring about engagement and interaction among K-12 students.

Faculty apply to participate in the program for a number of reasons (e.g., some want to simply try something new; others want to add this experience to their promotion and tenure portfolio). While faculty are not paid to participate in the program, each faculty receives an iPad as a small incentive for taking part in the program. Another benefit of the program is that, depending on availability, faculty can request semester-long use of iPads for all students in one of the courses that they are teaching.

Currently, the average acceptance rate to the mLearning Scholars program is 85%-90%. At the time of this study 90% of the applicants were accepted. Once selected and invited to participate in the program, faculty (i.e., the three cohorts of mLearning Scholars) meet every other week throughout the semester. Each meeting lasts an hour and half and is facilitated by an Instructional Designer (who specializes in mobile learning). During these meetings, faculty learn about the best ways of leveraging mobile devices to meet learning outcomes as well as how to use specific mobile applications. A conscious effort is made each semester, by the facilitator and participating faculty, to approach mobile learning through a blend of pedagogy and technology. Even though the biweekly meetings are facilitated by an instructional designer, participants are also mentored, and trained. They also learn from each other. Faculty also regularly discuss broader theories of learning as well as good instructional practices (e.g., active learning, problem based learning, engagement through student response systems, group work, peer review and instruction) throughout these meetings. Faculty also have the option to meet one-on-one with their facilitator outside of these meetings to discuss specific teaching and learning needs.

3 Method

The mLearning Scholars program, overall, appears to be a successful faculty development program; faculty appear to be happy with their experiences in the program and new cohorts continue to fill each year. However, despite this anecdotal data, we wanted to formally investigate faculty experiences learning about and integrating mobile devices into their courses. Among other things, we wanted to get a better idea of ways to improve the mLearning Scholars program, by improving the faculty experience, as well as to possibly identify some “best practices” of utilizing mobile devices in the college classroom. More specifically, we were interested in answering the following questions:

- RQ 1. How did the presence of mobile devices impact teaching practices?
- RQ 2. How did the integration of mobile devices impact student learning?
- RQ3. How did the integration of mobile devices impact course learning outcomes?

This study took place during Spring 2014. During that time, there were nine faculty in the mLearning Scholars program; however, only 8 of the 9 faculty agreed to participate in this study. The majority (50%) of the study participants belonged to the 1.0 level. Participants were also predominantly females (62.5%), teaching undergraduate courses with an average of 25-30 students (see Table 1). Western State University had a fleet of 270 iPads at this time; 70% of these devices were loaned to students of instructors participating in the mLearning Scholars program during Spring 2014. Students in these courses, though, were also given the option to use their own device.

Table 1 Faculty Participants in mLearning Scholars Spring 2014

Cohort	Gender	Discipline	Level
1.0 Level	2 Males 2 Females	Math, Elementary Education, German Language, Educational Technology	Undergraduate & Graduate
2.0 Level	3 Females	German Language, History, Literacy	Undergraduate
3.0 Level	1 Male	Educational Technology	Graduate

We utilized a qualitative case study approach to investigate faculty’s experiences integrating mobile devices into their classroom. All members of the mLearning Scholars program, irrespective of whether they agreed to participate in the research study, were required to submit a structured report elaborating on their experiences of attending the cohort and plans of implementing mobile devices in their teaching and learning. This was a part of the program completion requirements. The data for this study came from the final reports of the 8 participants that agreed to participate in the study. Data were de-identified, summarized, coded, and analyzed for themes.

4 Results

The results of our inquiry are addressed below. We separate the results by research question and then by emergent themes. The research questions and emergent themes are listed in Figure 2 to provide a big picture of the results.

Figure 2 Overview of research questions and emergent themes from faculty experiences integrating mobile technology into their classroom

<p>RQ 1. How did the presence of mobile devices impact teaching practices?</p> <ul style="list-style-type: none">• <i>Theme 1. Use of mobile applications to create content, communicate, store, and share information</i>• <i>Theme 2. Instructional design modifications</i>• <i>Theme 3. Instructor digital fluency</i>• <i>Theme 4. Assessment strategy</i>• <i>Theme 5. Social presence</i> <p>RQ 2. How did the integration of mobile devices impact student learning?</p> <ul style="list-style-type: none">• <i>Theme 1. Improved communication</i>• <i>Theme 2. Student digital fluency</i>• <i>Theme 3. Active learning</i> <p>RQ3. How did the integration of mobile devices impact course learning outcomes?</p>

4.1 RQ 1. How Did the Presence of Mobile Devices Impact Teaching Practices?

When asked about how the presence of mobile devices impacted their teaching practices, five themes emerged. Each theme will be addressed in turn.

Theme 1: Use of Mobile Applications to Create Content, Communicate, Store, and Share Information. Participants reported that the availability of mobile devices in the classroom enabled them to identify and use certain mobile applications that they had not used in the past in the classroom. Some popular applications were the following:

- **Explain Everything:** A screencasting whiteboard application, primarily used to create screencasts. Participants used this app to create short instructional videos for students.
- **Nearpod:** An application used to create interactive mobile presentations, which allows students to interact and submit responses through their mobile devices. It can also monitor, measure and aggregate student participation. Participants used this app to deliver content in class, involve students to actively participate, learn, create and share content during class.
- **Notability:** A note-taking application that integrates writing, drawing, and audio-recording functionalities. Participants encouraged their students to use this app to take detailed notes on their course readings.
- **Dropbox:** A cloud storage and content sharing application. Participants used this app to share feedback with students, and to collect homework and student created content.
- **Google Hangouts:** A video conferencing application. Participants used Google hangouts to have online office hours. Students used it to communicate with each other and complete group projects.

While participants reported that they were previously aware of a number of these applications, they had not considered using them in their courses prior to becoming mLearning Scholars. It took knowing that each student had a device in hand to help motivate participants to use these mobile applications in the classroom.

The participants reported that some of the benefits of these mobile applications were that they improved, anytime anywhere communication and connection (both planned and unplanned) among and between students and instructor, through apps like Hangouts or Celly (a different messaging app). Another participant, who worked in teacher education, explained how the presence of mobile devices, and the various applications, enabled her to push her students to begin designing mobile friendly lesson plans and instructional materials for their future classrooms. Another participant, explained how using his mobile device introduced him to Codecademy.com through the codeacademy app which he in turn began having his students use to earn badges as they learned to code.

Theme 2. Instructional Design Modifications. Rather than just finding ways to use new mobile applications, the presence of mobile devices also led some participants to modify previous assignments to take advantage of mobile devices. For instance, at times, activities were specifically designed which were meant to be completed outside class

using mobile devices (e.g., collect data at a local school, engage in asynchronous and synchronous discussions). However, some instructors reported that they purposely chose not to make changes to their course due to their inexperience with mobile devices; these instructors simply assumed and expected their students to use their mobile devices automatically to complete their class projects (which in fact, not all students did). On the other hand, a tech savvy instructor experimented with new ways to provide mobile device friendly content (e.g. HTML5 videos that play on all devices) for his courses; he replaced paper textbooks with e-books and pdfs, which enabled students to take notes using mobile apps. Another instructor had almost the entire course content delivered digitally through pdfs and website links--thus saving students hundreds of dollars by eliminating textbooks fees. Nearly all of the participants, though, who did not change the design of their courses had plans to do so the next time they taught. One instructor even began creating her own ebook to use in a future semester. Some instructors, however, did report that some of the changes they made to their courses caused them to stray away from the original learning objectives. And some foreign language instructors shared that while they did not use the devices much in class, students were able to use them for accessing e-textbooks and for creating learning aids like electronic flash cards while out of class.

Theme 3. Instructor Digital Fluency. Some instructors felt that their digital fluency had increased as a result of using mobile devices in their courses. They shared that they had a better pedagogical understanding of how mobile technology can be used in teaching and learning, and specifically for addressing course learning objectives. Instructors also had a better understanding of how mobile technology can enhance anytime, anywhere learning as well as improve student-to-student and student-to-teacher communication. They also reported that as their digital fluency increased, they were more comfortable incorporating mobile apps and digital resources into classroom interactions, assignments, projects, and examinations.

Theme 4. Assessment Strategy. Certain instructors shared that they allowed students to use their textbooks and mobile devices to access information during examinations, class discussions, lectures, and assignments. This required a modification of previously used test questions since they now needed to be targeted to test higher levels of learning and not merely the retrieval of knowledge/information. Using mobile devices helped these instructors think more deeply about how they assessed student learning in their courses. For instance, one instructor had their students create a video podcast for their final project using their mobile devices.

Theme 5. Social Presence. One instructor was interested in ways to use mobile devices to establish instructor social presence in online courses. He used his device to introduce his students to the university as a physical space through instructor created video announcements from various university locations. His students reported that this helped them feel a stronger connection to the university and their instructor and create a sense of belongingness for online students located in different parts of the world.

4.2 RQ 2. How Did the Integration of Mobile Devices Impact Student Learning?

Three themes emerged from data about how mobile devices impacted student learning.

Theme 1. Improved Communication. Instructors reported that the use of mobile devices improved communication because students could now connect with their peers and their instructor at anytime and from anywhere they had internet connectivity. They were able to see and hear the voices of their online peers and collaborate better on class projects. However, instructors teaching foreign language classes reported that the mobile devices actually got in the way of verbal communication during class time. Messaging apps like Google Hangouts enabled students to move beyond the password protected Learning Management System (which is logged into less frequently) to fulfill their peer communication needs.

Theme 2. Student Digital Fluency. The instructors reported that access to mobile devices increased students' digital fluency as well. So while most students had prior experience using mobile devices, they lacked experience using mobile devices for educational purposes. Some students also experienced a steep learning curve with using their mobile device because of their lack of previous exposure to the type of device. However, the instructors also reported that for most students, having access to a mobile device increased their confidence in their ability to use technology to create and share content. One participant, a Math instructor, reported that his students had a positive and welcoming attitude toward the effective use of technology in their future careers as math teachers based on their experience with using these devices in class; in his class, he had his students use their mobile devices to explore statistical concepts,

analyze statistical procedures and examples, and to communicate statistical ideas during class, assignments, and examinations. Student digital fluency was also improved through their use of e-books and educational apps like Code Academy.

Theme 3. Active Learning. Instructors reported that many of their students used the mobile devices for active learning. For instance, a math instructor reported that students used the device in almost every class to search for information, take notes, and work through steps of mathematical processes. Use of a mobile device was especially useful for teacher education students since they were able to create content for their student teaching placements. By looking up information via the internet, taking notes, creating and sharing problem solutions videos, students became active participants rather than passive recipients of information in class. In one class, the mobile devices were extensively used to complete a community service-learning project where it helped students to collect data, share information, and collaborate in real time with peers. Students learned from each other on how to use the mobile device to complete various assignments, search for information, create content, present information, and complete projects.

4.3 RQ3. How Did the Integration of Mobile Devices Impact Course Learning Outcomes?

The instructors reported mixed results when it came to how they thought mobile devices impacted course learning outcomes. In some cases, the instructors clearly believed that the mobile devices impacted the course learning outcomes. For instance, a math instructor believed that the mobile devices impacted learning outcomes in a statistics class where students were able to work through the steps of the statistical procedure, interpret the results, communicate their understanding, share results with peers, and generate statistical instructions. Additionally, instructors teaching courses with a communication-learning outcome reported that the mobile devices helped meet this learning outcome. However, some instructors reported that though the course learning outcomes were achieved, the use of the mobile device did not necessarily support their achievement. In a language classroom, use of mobile devices often led to students working individually and not engaging in verbal discussions with their peers. This is counter-productive in a language learning class where conversation is an essential learning outcome. Another instructor reported that the mobile devices seemed to distract students from the learning outcome for certain assignments where they seemed to focus too much on the tool and not enough on the product.

5 Discussion and Implications

The results of our inquiry show that mobile devices are not a panacea. They worked well for some instructors and in some classes but not as well in other instances. The overall success though appeared to depend on the instructor's self-efficacy (which depended on their comfort level using the devices) and how the instructor's redesigned their courses to meaningfully integrate the devices. Simply having access to the mobile devices led some instructors to modify previously created assignments to use the mobile devices. However, other instructors reported that the current nature of their assignments did not call for the use of mobile devices so they did not use them. In general, most of the instructors expressed the need to modify the design of their current instruction to include assignments, activities, and assessments, which required the optimum use of the affordances offered by mobile devices; our institution is fortunate to have instructional designers who can help instructors find innovative ways to redesign their courses.

Active learning strategies were successfully used when students used mobile devices to create content, collaborate, communicate, store, access and share content. Instructors thought more deeply about assessment strategies and modified previously used test questions in ways that worked well with mobile devices. Though most instructors reported that course learning objectives were met, some instructors reported that the mobile devices did not necessarily support their achievement.

Based on our experience in the mLearning Scholars program and the results of our study, we have identified some implications for practice. These implications for practice could inform not only faculty developers, but also faculty seeking to integrate mobile technology in their teaching and learning.

5.1 Strategies for Improving Faculty Mobile Learning Integration Self-Efficacy

Bandura's (1997) theory of self-efficacy—which posits that people's beliefs in their ability to influence events that affect their life has an impact on the actual actions they take—may explain why some faculty are more proactive in their use of mobile technology than others. Research has shown that self-efficacy can influence various aspects of teaching and learning (Barnard-Braket et al., 2011; Haddad and Taleb, 2016; Horvitz et al., 2015), most notably

whether or not faculty integrate technology into their class (Saleh, 2008). Research, though, has also shown that a technology focused professional development experience can have a long-term positive impact on faculty's self-efficacy (Watson, 2006).

While we did not formally assess the participants' self-efficacy, based on the data and our experience with the mLearning Scholars program, the following are some suggested strategies that can be used to support and improve faculty self-efficacy for using mobile technology:

- **Train faculty in the use of mobile technology:** Faculty are often so overwhelmed with their existing workload and administrative duties that they have little time to learn how to integrate new educational technologies into their teaching (see Lowenthal, Wray, Bates, Switzer and Stevens, 2013). To make the most productive use of mobile technology for teaching and learning, faculty, as well as students, should be trained how to incorporate this technology into class when teaching and learning (Vazquez-Cano, 2014). Consideration needs to be placed on the design, development, delivery, and evaluation of faculty development programs (Lefoe et al., 2009). To achieve this, faculty should have easy access to various learning opportunities—such as workshops geared toward integrating technology into the classroom and faculty learning communities focused on using technology in the classroom. Research has also shown that faculty can learn and find support from each other through peer coaching, mentoring, and consultations (Wilkerson and Irby, 1998).
- **Faculty as facilitators of learning:** Mobile devices are not perfect. For instance, students have reported various challenges with using mobile devices in the classroom, such as ill-functioning mobile applications, small keyboards (which make typing long responses difficult), and difficulty with simply staying on task and not being distracted (Gikas and Grant, 2013). To maximize the potential of mobile devices, instructors must change from being “transmitters of knowledge to facilitators of learning” (Corbeil and Valdes-Corbeil, 2007, p. 55); which will in turn change faculty's focus from the device to the student.
- **Institution wide adoption of teaching with mobile technology:** A comprehensive approach to faculty development, especially geared toward mobile technology integration, should be implemented at an institutional level, such that all new and existing faculty are made aware of the institution's commitment to teaching with technology. Faculty are more likely to excel in teaching with mobile technology when they are supported by organizational policies, which reward their efforts (Wilkerson and Irby, 1998).

5.2 Strategies for Meeting or Improving Mobile Learning Objectives

Learning outcomes for students cannot be improved unless sufficient changes are made to pedagogical practices (Lefoe et al., 2009). Some ways to improve or meet learning objectives related to the integration of mobile learning may be:

- **Identify discipline specific apps:** Discipline or course specific mobile applications have been reported to be a successful means of not only content delivery but also achieving learning objectives (Vazquez-Cano, 2014). Therefore, more emphasis should be placed on faculty development where instructors are trained on the use of mobile devices and educationally useful apps, which support the attainment of learning outcomes.
- **Create interactive anytime, anywhere, activities:** Mobile devices make it possible to place learners in realistic contexts, thus engaging in participatory simulations (Naismith et al., 2004). Museums and galleries often use context-aware mobile learning by having mobile devices provide supplementary information about exhibits based on the visitor's location. Such context-specific and immediate learning, which situates and connects learners, may also be beneficial to distance education students (Traxler, 2007).
- **Encourage faculty to learn from each other:** Faculty may learn from each other's experiences (Burrell Storms et al., 2015), therefore opportunities should be made available where faculty can share their knowledge and experience with each other, and determine how mobile devices can best support meeting learning objectives. This way the practices and experiences of early adopters and innovative users of mobile learning technology, can serve as good examples for colleagues institution wide. Faculty Learning

- Communities, and Communities of Practice, can be ways in which cohorts of faculty—interested in particular teaching, learning, and professional development goals—can share their expertise and experiences in an on-going basis (McDonald and Star, 2014).

5.3 Recommendations for Effective Faculty Professional Development

The following recommendations emerged from our inquiry on how to help prepare faculty to effectively use mobile devices in their courses:

- Offer one-on-one tutoring sessions for faculty using mobile devices in the classroom.
- Train faculty on the use of specific apps and model how they can use the apps to improve teaching and learning.
- Support all faculty—both those who teach face-to-face as well as online courses—to use mobile devices.
- Provide regular interaction with other faculty to share experiences.
- Enable faculty opportunities to observe their peers using mobile devices in their classrooms.

5.4 Future Integration of Mobile Devices in Instruction

Finally, based on our experience and the results of our inquiry, we have the following ideas on how to better integrate the use of mobile devices in instruction:

- Integrate mobile devices in all courses so as to maintain consistency across curriculum.
- Find ways and means of better assessing student growth and engagement with mobile technology.
- Design more interactive anytime, anywhere, exercises using mobile devices.
- Identify apps that effectively support the completion of assignments meeting specific learning outcomes.
- Move from a mindset where the educational use of mobile devices is viewed as optional to where it is seen as mandatory. That way, the use of these devices becomes more organic to the process of teaching and learning rather than a mere technology add-on.

6 Conclusion

The goal of this study was to investigate faculty perceptions on how the use of mobile devices impacted their teaching and learning practices. It also aimed to record perceptions on how mobile device use impacted student learning. While the results of this study should not be generalized, we have identified several implications that we believe have practical significance for institutions looking to integrate mobile technology into their classes.

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