Mobiles and Flipping in Oman

Bloom Buys a Smart Phone

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Abstract

At Sultan Qaboos University, a Master's level course offered by the Instructional and Learning Technologies Department in the College of Education used mobile devises to explore their uses and potential educational value. The students used their smartphones to personalize and interact with e-content delivered via the course management system, *Moodle*. In juxtaposition with the mobile usage, the instructor "flipped" some the content of the course. Flipped or reverse instruction is a relatively simple concept. Instead of the teacher delivering content in class lectures and homework for practice, the students are provided content instruction as homework and time to practice their skills during class. The flipped-mastery learning environment, based on Bloom's Mastery model, provided an added element by allowing students to set their pace of mastering content. This paper focuses on a small investigative study using mobile devises for learning with the flipped-mastery delivery method and explores the potential roles of mobiles in Omani education. The paper concludes with thoughts on the intrinsic value of mobile devises for teaching and learning.

Keywords

Mobiles; Reverse Instruction; Flipping, Bloom; Mastery Learning; Educational Technology; Oman

Introduction

Research has shown that whenever a new feature is added to a classroom - specifically technology, things can change – sometimes subtly and sometimes dramatically (Hilligoss and Selfe 1994; Fullan 1995; Chickering and Ehrmann 1996).

With the introduction of new technologies in schools, classrooms have been profoundly altered and the results have left many educators wondering of its effects. However, this technology alteration happened over a decade ago. Nowadays, students no longer come to school to learn about the new technologies. They bring their own hardware and proficiencies that often exceed their teachers. What was once referred to as the digital divide has now become a divided mindset between students and educators. At Sultan Qaboos University, educators are also experiencing this mindset mismatch, specifically with the ubiquitous presence of mobile technologies. As their colleagues elsewhere, SQU faculty have also begun to rethink the roles of the new technologies and as importantly, the *ways* in which we teach with them. *Flipping*, or reverse instruction is one of these ways of rethinking the classroom instruction with the new technologies. This paper presents impressions from the instructor from the Instructional & Learning Technologies Department (ILT) and a class of graduate students who experienced flipped-mastery instruction using mobile devises in their educational technology course during the spring semester of 2013. The paper's identifies emerging themes from this investigation with the use of these mobile devises and their potential value in education.

The Flipped-Mastery Model

Two American high school teachers, Jonathan Bergman and Aaron Sams, first coined the term *flipping* while experimenting with self-recordings of their class teaching they provided to students missing their lectures. These videos proved to be beneficial not only for the absentee students but for others who wanted to review the content and study aids for exams. Jon and Aaron noted improved student preparedness, motivation, and even an improvement of grades. The two decided to try out entire classes with this method and the flipped classroom was born (Bergman and Sams 2012). However, Bergman and Sams did not stop there. The teachers observed that while students seem

to perform better on tests, retention of the content and skills still appeared only test-deep. Bergman and Sams began applying Bloom's Mastery model of content pacing and moving away from the lock-step tempo of school curriculum. They realized that having the flexibility of content delivery also provided more accommodation for students individual needs to obtain content mastery. So what does the flipped-mastery model look like?

The flipped classroom flips where and when homework and lecture takes place. Instead of the teacher directly delivering the content during classroom time, the students engage in direct instruction through technology supports outside of class time. This requires the teacher prepare the direct instructional supports by either recording the lectures on video or locating pre-created deliveries suitable for the instructional content. A flipped-mastery class directs students through the direction instruction and class activities with the additional flexibility of allowing students to repeat, review, and adjust the delivery pace to suit their academic requisites. Criteria guides, homework deadlines, scheduled activities are still in place in the flipped- mastery class; the difference is that through careful curricular and time planning, students can move through topics at a pace more closely fitting their needs (Bergmann and Sams 2012).

The flipped-mastery model provides archived content that in turn, provides the opportunity for differentiated instruction while personalizing the learning to fit the pace of the individual student's needs (Hertz, M 2012). This model also provides opportunities for more time in the classroom with the teacher to interact with the students and students with the content. This model blends direct instruction and constructivist learning as well as blends technology instruction with face-to-face learning.

Bloom Buys a Smart Phone

John Dewey (1938) promoted the focus of class time on application and "learning by doing" early in the last century as well as other educators such as Montessori, Vygotsky, Freire (Montessori 1976, Vgyotsky 1978, Freire 2007). When using the flipped instructional method however, there is an added element not presented during Dewey's time – the new technology tools. Chickering and Ehrmann recognized that learning changes when you add technology in the teaching and extended the discussion of best practices

using technology in undergraduate education (1996). Summarizing decades of educational research findings, Chickering and Ehrmann stressed active learning, increased time on task, authentic learning environments, and student/teacher interactions. Educators have known that best practices recognize students perform better when their educational activities are constructed in real-world environments with tools that are familiar to them (Kolb 2013). Bloom embraced these curricular constructs to support the mastery of knowledge. The conversation for flipped-mastery too has highlighted the technologies venue to include podcasts, blogs, online readings, social media, and mobiles for content delivery. Bloom's mastery visual has integrated with these technologies to include them as shown by Samantha Penny's pyramid graphic in Figure 1. that appears below.
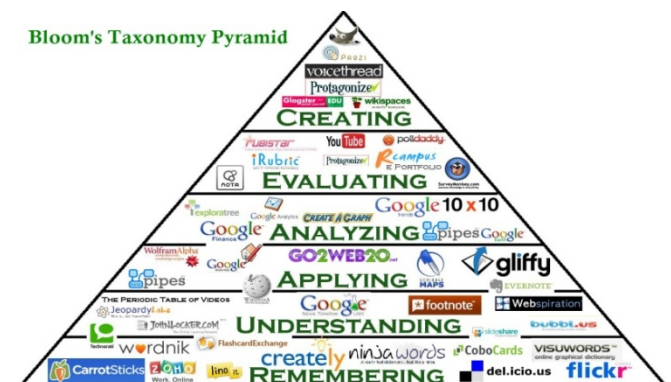

FIGURE 1 BLOOM"S DIGITAL TAXONOMY PYRAMID

In 2006, most students in the U.S. did not have mobile devises and most students did not have Internet accesses (Chan et al. 2006). Less than 5 years later, national surveys in the U.S. have reported that at least 83% of teens own mobile phones (Smith 2011). Two years later has seen almost full saturation of mobiles as they become universal tools for communication and information.

Two thousand miles away at Sultan Qaboos University, as graduate students are being prepared lead the new generation of educators onto 21st century global educational stage; all students have web accessible mobiles. In spite of the students' rich-technology resources, their cultural paradigm remains traditional with an educational system that relies heavily on the teacher to deliver course content. However, with the convergence of technological innovations and pedagogical shifts, SQU is rethinking classroom teaching and readjusting cultural tradition to update best teaching practices. SQU recognizes the need to provide authentic and relevant processes for

students to access and interact with their course studies. If students learn better by situating school activities in authentic learning environments using familiar tools, it follows that educators should begin finding ways to capitalize on the use of these mobile devises.

Ten years from today, students will be learning at their own pace. The classroom will be a place for active interaction, not passive listening and daydreaming. The role of the teacher will be that of mentor or coach as opposed to a lecturer, test writer, and grader. The institutions that will remain relevant will be those that leverage this paradigm, not fight it. (Khan 2012)

The availability of portable one-on-one technologies at SQU provided the opportunity to include mobiles to support the blended learning environment in courses provided by the Instructional & Learning Department. Mobile use provided an additional venue to leverage to enrich the experience to include a more personalized, convenient delivery of anytime, anywhere content.

The Participants

The Masters level course was chosen for several reasons. These students possess strong language and metacognitive abilities to process and explore alternative methodologies. Their self-reflections can aid understanding potential effect, particularly when crossing cultural terrain (Levy 2007). In addition, these graduate students are being groomed for continued improvement of their teaching, disseminating their knowledge through professional development and future educational leadership. Challenging them to explore both their current practices and innovative methodologies is particularly appropriate for graduate students and should be part of their successful plan for preparedness (Knapp & Glenn, 1996). Access to large groups of candidates who possess these skills are currently limited to the researcher. A small, intimate number of participants may provide insight into future areas of research in this field.

Course Structure

The Instructional and Learning Technologies Department provides one educational technology course as part of the two year Educational Master's program of studies. The goals of this course are to provide opportunities for the students to explore a variety of powerful technology tools that support

teaching and learning framed within a sound historical and pedagogical educational technology framework. In addition, the activities are designed to hone the research skills of students with a focus on best practices and advanced critical thinking within their own cultural construction. The flipped-mastery model provided an innovative approach for the students within a familiar direct instruction framework. Finally, each year an advancement in technology is included to challenge students to think beyond the familiar and engage their imagination. This past year, this innovative hook was mobile learning. Mobiles may be universal; however, the consequence of using nontraditional devises with an unfamiliar teaching strategy requires examination from indigenous viewpoints.
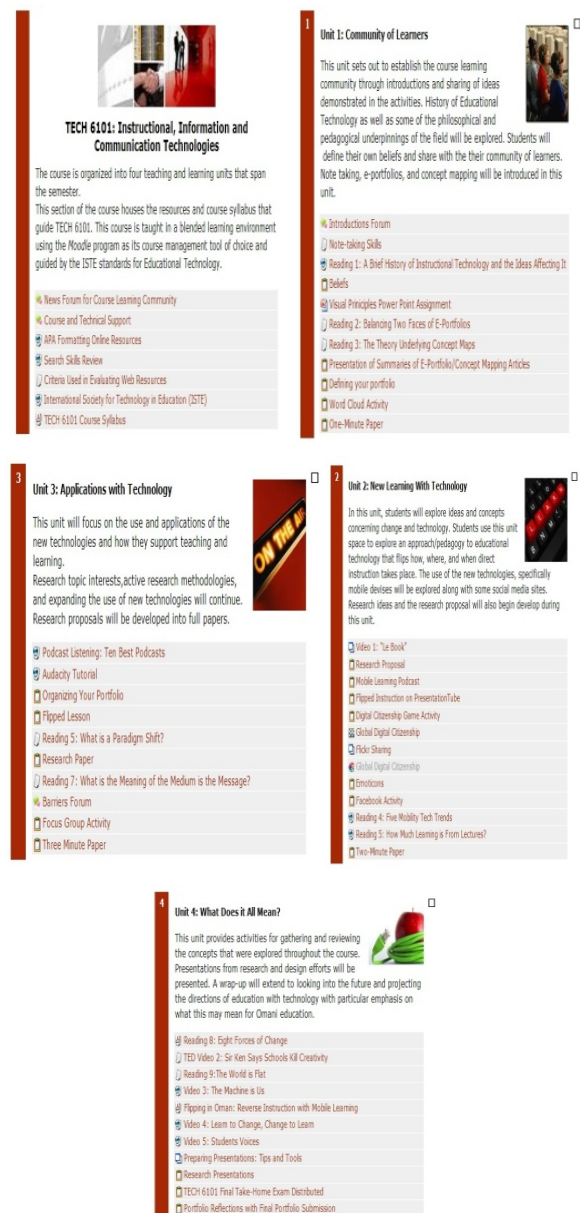

FIGURE 2. MOODLE COURSE SCREEN SHOTS

The course design used a blended teaching and learning environment with *Moodle* as the course management tool. Face-to-face interactions took place during the four-hour class/lab time during the week. The four-unit course was designed to begin with supporting student readiness by introducing familiar delivery practices – professor to student – in the first unit to establish comfort within the blended learning environment. A review of note-taking skills, lab usage, and communication protocol were conducted. The second unit of the course was designed to acquaint the students with current methodologies in educational technology that included flipping and extended to the flipped-mastery model of teaching. Toward the end of the second unit, a reading and discussion of focus group functions and research roles was provided for the students. Unit Three expanded flipped-mastery to include using mobile devises to deliver content. The final unit provided closure to the multiple projects, predictive considerations into the future of educational technology in Oman, and final reflections. The screen shots of the course designed and managed in *Moodle* appears below in Figure 2.

The Investigation

A small-scale qualitative approach was used to allow for an intimate, deep exploration of mobiles in education within the cultural contexts of Omani society. Educational researchers encourage participants to reflect on their teaching practices and underlying assumptions and for researchers to build reflective opportunities for participants to do so (Bednar, Cunningham, Duffy, and Perry, 1992). Few studies have been conducted within Oman in the field of educational technology, specifically mobiles, to date. Piloting even a small reflective study at this time may encourage funding of future longitudinal studies in this important field. In addition, potential cultural sensitivities concerning the ubiquitous nature of technology usage need to be a foremost consideration for researchers conducting research outside their native settings (Denzin and Lincoln 2005).

The qualitative approach was chosen as the optimal means to explore the deeper cultural issues of technology's potential impact on local education. The qualitative approach permits the researcher to interact with the teachers within their natural settings, and at the same time, recognizes the important of multiple perspectives and contextual characteristics that may impact the effects and interactions under investigation (Patton 1987). Participant surveys, end-of-unit reflections, focus group feedback and instructor observations were used to gather data that addressed the questions concerning mobiles in the local educational context. These questions focused on prior teaching experiences, technology accessibility, general attitudes toward technology, and current technology practices.

Construct validity was addressed to provide multiple measures of the same phenomenon with measurement tools used previously to establish the levels of experience, practices and attitudes concerning mobiles. The steps taken in this study were traced to maintain a chain of evidence to increase reliability of information as well as validity of the methods. The researcher distributed and collected data from four assessment tools, the Participant Survey which included participant demographics, 4 Unit Reflections for formative participant feedback, the Focus Group Session for summative participant reflections, and finally the Instructor Journal entries for self-reflective feedback. Analysis from these four tools took the form of categorical aggregation, summing of coded data for patterns and themes, and direct interpretation. Results from these tabulations are presented here for further analysis.

Procedures

Participant surveys were distributed online using *SurveyMonkey* during Unit 1 of the course to establish participant demographics, technology experiences, and technology practices. A review of digital citizenship skills, action research procedures, note-taking, and self-reflective processes established groundwork for further inquiry. During the Unit 2 activities, the flipped-mastery method of instruction was examined and experienced, pedagogical underpinnings studied, and mobile devices explored. Activities to provide direct instruction assigned as homework included the use of podcasts, online readings, short video clips (20 minutes or less), and online slideshows. Note-taking was also part of the homework requirement reviewed and discussed during class time.

Unit 3 continued with project-based activities using flipped-mastery for theoretical instruction and mobiles for delivery.

Mobile usage included three types of mobile functions: mobile utilities such as texting and phoning, mobile applications such as What'sapp and podcasting, and mobile-adapted web applications such as Flickr and

Facebook. Unit 4 was devoted to project completions, presentations, and directing discussion toward cultural considerations. Participant reflective activities were completed during and after the completion of each of the four units that included end-of-unit reflections and a focus group feedback. Instructor observations were recorded beginning in week 2 and continued through week 15.

Analysis

1) Participant Surveys

The results of the participant surveys were analyzed at the end of the course using coded classification to identify patterns, connections, and emerging themes. The participant demographics and prior experience portion of the survey revealed the group was made up of 6 females and 1 male, with 6 teaching high school and one teaching the primary grades. All participants had over 4 years of teaching experience, all were connected at home and at the university, and all used smart phones. Most of the participants had experience with the Internet before attending university (87.71%), and all owned an additional mobile devise such as a laptop, tablet, or iPad. Table A. below shows the Participant Information Survey results.

TABLE A. PARTICIPANT INFORMATION

Do you have Internet connection at home?		Yes	No
Do you have a mobile phone?		100%	00%
Do you have "smart" phone (Internet accessible)?		100%	00%
Do you have a laptop, tablet, or iPad?		100%	00%
Used Internet before coming to university?		Yes 85.71%	No 14.29%
Gender		Female 85.71%	Male 14.29%
Choose the number of years of teaching experience.	4-7 years 57.14%	8-12 years 28.57%	More than 12 years 14.29%
Choose the grade level of your students.	1-4 grades 14.29%		5-12 grades 85.71%

Participant surveys also asked about their general attitudes about technology and current practices using technology. The questions on general attitudes toward education called on the participants' currently held assumptions toward education in general, particularly the role of active learning, direct instruction, homework, and professional development. The questions on current educational practices focused on the participants' own practices and their university experiences. Both sets of questions were intended to highlight the relationship between participants' assumptions and the experiences with teaching and learning.

These two portions of the Participant Survey revealed that all the participants used the Internet with their university studies and all agreed the new technologies provided useful support for teaching and learning; however, not all (42.86%) used the Internet in their schools, nor did the same percentage frequently use social networks such as *Facebook*, *LinkIn* or *Twitter*. Even though all responded using technology specifically with word processing, emailing, and texting, organizing, managing, and creating, there was less agreement about using technology to manage their visuals (85.72%). All participants agreed the new technologies are useful for teaching and learning. All agreed that all teachers in Oman should receive training, and that the new technologies had a strong impact on how teachers teach and how participants learn. In spite of these agreements, almost half (42.86%) of the participants reported that their schools did not provide training about how to integrate technology in the teaching and learning process and only 28.57% agreed teachers in technology-specific subject areas only should receive training about technology. All agreed that m-learning (learning with mobiles) was important for education and all agreed participants should have access a laptop/tablet in schools. Most (85.71%) agreed they and their students enjoyed learning new technology skills but only 71.43% agreed students should be allowed to use mobiles in class. Table B. below shows the Participant Survey results from General Attitudes about Technology and Current Technology Practices.

TABLE B. PARTICIPANTS SURVEY ON TECHNOLOGY

SA = Strongly Agree (5) A = Agree (4) Neutral (3) D = Disagree (2) SD = Strongly Disagree (1)	Frequency of Responses %				
	1	2	3	4	5
General Attitudes about Technology					
1. The new technologies are useful to support teaching and learning.	00%	00%	00%	14.29%	85.71%

2. The new technologies have changed the way teachers teach.	00%	00%	00%	28.57%	71.43%
3. The new technologies have changed the way students learn.	00%	00%	00%	42.86%	57.14%
4. All teachers currently teaching in this country should use technology in their teaching.	00%	00%	00%	57.14%	42.86%
5. Only teachers in specific subjects related to technology should receive training about how to best use the new technologies in their classroom.	28.57%	42.86%	00%	00%	28.57%
6. Every learner should have a laptop/tablet as part of their classroom tool kit.	00%	00%	00%	57.14%	42.86%
7. M-learning will be an important tool for the future of teaching and learning.	00%	00%	00%	28.57%	71.43%
8. Students should be able to use their mobile phones in the classroom with teacher guidance.	00%	14.29%	14.29%	14.29%	57.14%
9. I like learning new skills using technology.	00%	00%	00%	14.29%	85.71%
10. My students like learning new skills using technology.	00%	00%	14.29%	00%	85.71%
Current Technology Practices					
1. I use the new technologies to support teaching and learning.	00%	00%	00%	71.43%	28.57%

2. My school encourages me to integrate new technologies into my teaching.	00%	00%	00%	71.43%	28.57%
3. My school provides training about how to integrate technology in the teaching and learning process.	00%	14.29%	28.57%	42.86%	14.29%
4. I frequently use the Internet at home.	00%	00%	00%	00%	100%
5. I frequently use the Internet at university.	00%	00%	00%	42.86%	57.14%
6. I frequently use the Internet in my classes at school.	00%	28.57%	14.29%	42.86%	14.29%
7. I frequently use word processing, emailing and texting.	00%	00%	00%	00%	100%
8. I frequently use social networks such as Facebook, Linked In, and Twitter.	00%	42.86%	00%	14.29%	42.86%
9. I frequently use the new technologies to organize, manage, and/or create.	00%	00%	00%	57.14%	42.86%
10. I frequently take, edit or create photos and pictures with the new technologies.	00%	14.29%	00%	42.86%	42.86%

2) Participant Reflections from the End-of-Unit Reflections

Additional feedback from participants took the two forms - reflections initiated by end of Unit 1 assignment through Unit 4 posted in *Moodle* and feedback from a Focus Group held at the completion of Unit 3. The questions for the end-of-unit reflections were open-ended. The purpose of this assignment was to provide opportunities for the participants to individually respond about their

experiences with mobiles without the concern of formal writing protocol and grading. Several dominant patterns emerged from the responses. All responders mentioned the personalization of the experience using mobiles. The participants stated the experience "personalized and individualized" their learning and served their convenience. The mobiles are "easy to carry" and the "net service is faster". Mobiles, a participant stated, allowed shared files distributed among the class during the Unit 2 session as they were preparing for a midterm exam in another course. At that time, the Internet had been down because of increment weather. Several participants also stated they would like to begin using mobiles with their colleagues while conducting workshop sessions. However, several also commented that they were not always comfortable communicating with classmates and the instructor with the mobile as this allowed too much access at times. The connectivity issue was also seen as a detriment by participants. One participant pointed out that "most of our students do not have Internet access at home." Other participants question the educational value and control of using mobiles and worried that "learning will be just as a game" where "no boundaries can be expected". One stated that this was not what she expected where "text messages, e-mails, Facebook comments and What'sapp messengers were valued". Another participant observed that mobile use is already happening here in this country when she "attended a course teaching the hidden meaning of the Holy Quran on the What'sapp application". All agreed that they would like to use mobiles in their professional development workshops. Table C. below shows the Minute-Reflections patterns that emerged.

TABLE C. PARTICIPANTS REFECTIONS EMERGING PATTERNS

Topic	Emerging Patterns
Mobile Use	Enthusiasm about using mobile devices for use in their learning
	Personalized use of mobiles was both positive and negative
	Several participants saw using this method in workshops with other teachers
	All participants easily completed the activities using mobiles
	All participants had concerns about using these devices in the local classrooms with students

3) Focus Group Session

The Focus Group session was conducted to provide a group response to the mobile experience in class. As with the end-of-unit reflections, the questions were open-ended that focused on their thoughts, expectations, and application using mobiles in their learning and their teaching. Similar to the end-of-unit Reflections, participants observed both enthusiasm and trepidation with the use of mobiles. Again, there was uncertainty about the mobiles' "added value" to students' education and surprise there were so many educational uses with already familiar mobile functions. Participants repeatedly identified obstacles for mobile use that centered on the technological infrastructure shortcomings in this country – outdated machines, inconsistent connectivity, and lack of teacher training. Respondents spent more time discussing concerns about the use of mobiles during the focus group session than in previous reflections. These concerns mainly focused on the perceived lack of control of the students using mobiles and the lack of support from the teachers and community. There was a concern about the personal nature of mobiles and whether the "personal learning space" was appropriate for educators to occupy. Table D. below shows the Participant focus group patterns that emerged.

TABLE D. FOCUS GROUPS EMERGING PATTERNS

Topic	Emerging Patterns
Mobile Use	Convenient anytime anywhere, personalized access to devise appeared valued in participants' studies
	Concerns emerged about the "added educational value" for their students with mobile use
	Concerns emerged on the lack of connectivity overall in the country
	Concerns emerged about the invasion of personal spaces with mobile usage
	Concerns emerged with classroom management of their own students
	Concerns emerged about lack of teacher training using mobiles in schools

4) Instructor Journal Reflections

Feedback from the instructor was drawn from observations recorded in a journal during the process of the course from Week 2 through to Week 15. As with the participant reflections, several patterns were woven through the journal entries. Mobile instruction was again met with enthusiasm though there was more questioning and concerns over their local classroom application. Flipped activities continued but homework was then done using the mobile. For example, a podcast

was provided about mobile technologies that were uploaded to their mobiles. Their homework required they listen to the entire podcast and take notes of the salient points of the presentation. There was rarely a problem with homework completion with both the flipped activities and the mobile uses. Since both were often used in conjunction – delivery of content instruction for homework using their mobile devises - , there was much time spent during the face-to-face sessions, discussing how to utilize mobile apps, web access, and functions outside of class. Surprises to the instructor also included the personal nature of the mobiles. Taking photos became a lesson for the instructor about image privacy and cultural appropriateness for capturing images. "Participants are uncomfortable with taking pictures of themselves and providing images for profiles". Even though communication parameters were outlined at the start of the mobile use that established "office hours" for the instructor access, the instructor often received texts and phone calls outside these boundaries. The "personal connections also overflow into my own examination of personal space and yes, even discomfort". The instructor also observed during her discussions with the participants that in spite of their enthusiasm with "anytime, anywhere" learning, few of the participants were planning to utilize the mobiles in the classroom teaching. Concerns with classroom management, lack of support from their colleagues and administrators and community, and questionable educational added value were most often raised during the discussions. Table E. below shows the instructor journal reflections patterns that emerged.

TABLE E. INSTRUCTOR JOURNAL REFLECTIONS

Topic	Emerging Patterns
Mobile Use	Instructor observed participants' enthusiasm with utilizing new mobile tool for teaching and learning
	Instructor observed participants enjoyed the convenience of anytime, anywhere connectivity
	Instructor observed some frustration with activities requiring personalized information such as taking photos of self and others.
	Instructor observed some participants struggled with mobile use parameters set up with instructor
	Instructor observed concerns by participants about using mobiles in their local classrooms

Discussion

New technologies appear to have a positive appeal to the participants in this investigation. Mobile phones, for the most part, also interested the participants both in the theoretical discussions and with assignment usage. Convenience, access, novelty may attribute to the positive responses. Using a familiar strategy such as direct-instruction teaching for culturally conservative educators may have flattened the learning curve to allow a more comfortable experience in their own learning.

Though the participants were eager to share these new ideas with their colleagues at school, concern about educational value, classroom management, and parental reactions appeared to affect their confidence about their success applied with their students in the classroom. The participants often spoke as a group when they commented that even though they enjoyed the experiences, they would not use mobiles with their students in school. This inconsistency is not uncommon among educators in other countries. As in real life, educational best practices do not always adapt to the realities of classroom practice.

It was hoped that using a familiar direct instruction strategy such as mastery learning combined with technology could ease the integration of technology to a more palatable pace for Omani teachers. It appears more bridging efforts are needed to fully investigate these notions. Limitations of this study were the small number of participants, the one semester timeframe, and open-ended questions conducted by a foreign researcher. Suggestions for further study may include deeper investigation about the way educators deliver content as well as revisiting the reasons why educators do what they do. Is the added value of technology enough to adapt a direct instructional strategy when many schools in other countries are moving toward discovery, constructivist learning paradigms? Will technology continue to motivate students after the novelty has passed or will they continue to intimidate teachers who are less skilled with these tools? Perhaps with a larger group over a longer time period with Omani researchers framing specific questions, new data would be generated that could better inform these lines of inquiry.

Conclusion

New investigations may more fully establish that the flipped-mastery model can provide a necessary bridge to less familiar strategies for more conservative

educational countries such an Oman. No longer can educators consider the use of mobiles in isolation either; educators must consider the ways to utilize them within the culture of the classroom. Mobile phone use has become a kind of cultural capital for university participants with their ubiquitous use and availability. Educators need to understand this cultural artifact as a powerful educational opportunity in order to benefit from their presence. Currently, classroom teachers have an uneasy relationship with mobiles in the classroom that not only alienates many of the students, but underuses a universally available resource within their own learning environments. This study hopes to highlight the inconsistencies that exist for many educators when studying about technology integration and the hesitations of applying their knowledge in schools. Thoughtful planning by educators to enter into that mobile culture will be necessary or the opportunity to capitalize on their usage may bypass teachers completely. This small investigation's biggest success may not be limited to whether it explored a better strategy or a better tool for teaching and learning but how it may extend this conversation to successfully stimulate further discussion and action among faculty, students and administrators.

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