Mobile Technology and Student Academic Success: What Do Students Find Valuable?

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Abstract*—A survey of students was used to elicit their perception of value of technology-based course features with respect to learning and course success. Particular attention was paid to the mobility of technology elements. The goal was to gain understanding of what students value and thus determine direction for course innovation and development, especially with respect to mobile technologies.*

Keywords*—mobile instruction, student success*

I. Introduction

Today's students own and use (extensively) all sorts of technological devices, and their use of these expands opportunities for faculty to enhance student success. The 13th annual College Explorer survey found college students own, on average, 6.9 technology devices [1] and the devices they own are more likely than not to be portable or mobile [2]. Further, compared to the overall adult population, college students own multiple technology devices at higher rates, are 27% more likely to be a frequent user of home broadband, and are more likely to use the Internet on their mobile phones [2]. Since today's college students have "a moderate preference" for use of information and communication technologies (ICTs) in the classroom [3], they may, indeed, expect faculty members to provide ample opportunity for extensive use of technology in classes. In response, some universities have embraced m-learning (a mobile form of e- or online learning) due to its potential to develop peripheral skills that include digital literacy, good communication skills, creativity and innovation in their field of study, critical thinking skills, the ability to learn independently, and team-based learning [4].

As ICTs have evolved and advanced in sophistication, so has the application of computers to education. Progressively, these technologies have been used to provide information, instruction, tutoring, testing, feedback, and more for students. Claims have been made that technology used for instruction prepares students with general skills in addition to the content knowledge they acquire. The U.S. Department of Education terms these general skills "21st century skills" and credits classrooms infused with digital learning tools for developing these skills and increasing students' engagement and motivation, and thus, accelerating their learning [5]. A policy brief from the International Society for Technology in Education ties general skills to the workplace, stating that skills acquired by students through their use of ICTs for learning are necessary for competing for jobs and for workplace productivity once hired [6].

As underlying technologies including the World Wide Web, ubiquitous access to the Internet over broadband, better battery life, flash and solid state memory, and others have matured, the use of mobile ICT devices to provide learning experiences beyond the classroom has expanded. Researchers have studied the application of mobile devices, in particular, and have reported that mobile ICTs supports learning in a number of ways [7, 8]. For one thing, the highly portable combination of mobile hardware and software together with the infrastructure of the global Internet make the learning platform available whenever and wherever the student user needs to learn. Also, the variety of mobile hardware and software makes learning adaptable to the learner's abilities and knowledge base. Further, mobile ICTs enable communication with experts as well as peers, which is another element of learning. Mobile devices offer convenience for learning over an extended period of time and an extended sense of place. Use of mobile technologies is intuitive for many, which enables broader use, even by people with no previous experience with the technology. In a 2018 study, Wong examined the literature for success indicators that have been used with studies of m-learning in an attempt to identify a common set of critical success factors that could be used for benchmarking m-learning initiatives [9].

In light of advancements in the application of ICTs to education, this study used a survey that addressed technology use in higher education with a perspective on mobile versus portable and non-portable devices. Respondents expressed opinions about how instructors use technology to support student course success and they also answered questions about personal versus academic technology use. The intent of the study was to explore the use of technology in the classroom

from a student perspective, paying attention to students' ideas about the value of mobile technology. The authors investigated whether device mobility was a factor to be considered.

II. BACKGROUND LITERATURE

As ICTs have grown in number and sophistication over the last twenty years, so have digital tools to support learning and instruction grown in use and popularity in higher education. However, despite an expansive literature on the topic, it is not clear to what extent ICT use in higher education has improved the learning environment for students and faculty and to what extent student outcomes are impacted. Research is being conducted on many fronts regarding the nature, effectiveness, and transformative potential of ICTs in higher education.

Learning Characteristics of Digital Natives

Some research focused on whether the learning characteristics are different for students who have been using technology since birth (digital natives). Learning characteristics attributed to digital natives include fluency with digital devices and software (thus precluding a need for specific use instruction), connectedness, high levels of multitasking, need for experiential learning, need for immediate feedback/response, social nature that aligns with team work, preference for images over text, and community mindedness [10, 11]. Empirical research has not conclusively verified generational differences with respect to some or all of these learning characteristics [10, 12, 13].

Use of ICTs for Instruction

Some experts look to ICTs for their potential to transform higher education instruction from predominately didactic, teacher-centered approaches to student-centered approaches. There is evidence that a student-centered approach is necessary for effective use of ICTs for instruction [14]. However, some studies found that, currently, technologies most frequently employed for instruction in higher education are used to replicate didactic practices whose purpose is to transfer information (content) from instructor to student, which is a teacher-centered approach [14 – 16]. Three factors have been identified that interact in a complex way to influence when and how technology is used in higher education instruction. These are the context of learners with content and with teaching and learning strategies; the design for learning which includes types of activities, materials, and resources; and the characteristics and constraints of available technologies [12]. Further, use of ICTs in instruction is likely to be changing over time as familiarity with various technologies grows, and some studies have looked at changes over time [14, 17]. The consensus of the studies reviewed is that use of ICTs for instruction is evolving along with the technologies, and as processes evolve the effectiveness question must be revisited.

Mobile ICTs in Learning and Instruction

Much research about using ICTs for instruction and learning does not consider the mobility of the ICTs, students, or instructors [18], but some does. Characteristics of mobile learning that have been defined include a) assumes learners learn across locations, acquiring ideas/resources in one location, applying/developing them in another; b) occurs across time with learners revisiting knowledge gained earlier in different contexts; c) is fluid from topic to topic with learners managing a range of personal learning projects rather than digesting a formal curriculum; d) learners move in and out of engagement through technology; e) learners rather than the technology are mobile; f) occurs interwoven with everyday life; g) both generates and satisfies goals; h) enables distributed control and management of learning; i) learners interact to construct context, j) complements and conflicts with formal education; k) may raise ethical issues of privacy and ownership; l) is technology centric, m) is related to online learning, n) augments formal education, and o) is learner centered [19-21]. In the era of mobile technology, education is conceived as a student-centered conversation that happens in context, enabled by learner-initiated interaction through personal, mobile technology [19].

Technology and Devices in Learning and Instruction

The spectrum of technology and devices for learning includes mobile devices (tablets and smartphones), portable devices (laptops), and non-mobile devices (desktops), plus infrastructure such as networks, communication protocols, and programming libraries that make application development faster while producing more reliable applications. While each technology could be examined for its role in mobile learning, most of the literature considers these technologies as a whole. The findings conclude that these technologies are a supporting factor of learning; they are tools [22]. The tools are ideal support for research and inquiry and for fast communication and information transmission, both synchronous and asynchronous [18, 23]. The technologies are described by researchers as serving a mediation function between learning and content (information) processed through individual or collaborative inquiry [24, 25].

III. STUDY DESCRIPTION AND METHOD

Motivated by a desire to better understand students' use of technologies, including mobile technologies, for learning, the researchers created and disseminated a survey directed at these concepts. The survey was completed by 256 students enrolled in seven university courses which are part of degree programs offered by the College of Technology at the

University of Houston, a diverse, urban public research institution. The survey gathered data about student perceptions, which were considered important because students' perceptions influence many behaviors, including behaviors related to learning. Results related to the context of lifelong learning were presented in an earlier publication [26].

The research objective was to obtain a clearer understanding of answers to the following questions:

- What mobile devices are commonly utilized by students to support learning?
- How much do students use mobile devices for learning, especially compared to their use of laptops and desktops?
- What course features or technologies do students see as important to their success and is mobility with respect to these features important?
- Does student preference for learning with technology interact with the mobility of the technology?
- How can instructors promote and develop student success through mobile technology and course design features that take advantage of mobility?

Students completing the online questionnaire were enrolled in one of seven courses of various levels, from varied disciplines within the College of Technology, and in varied formats including online, face-to-face, and hybrid courses. Students, in general, were familiar with the environment in which the survey was delivered which was the assessment module of the learning management system (LMS) used for University of Houston courses. Survey completion was voluntary and participating students were assured of the anonymity of their responses.

Questionnaire items were designed to elicit student perceptions regarding their overall experience with technologies and learning. Some concepts were explored using a semantic differential scale approach, while others were explored using a Likert scale. The forty-four items were organized into sections. Section one questions asked for demographic information about students. The other survey sections addressed the following information areas:

- Device use for academic work, non-academic use, or both
- Preferences for technology features potentially used in classes
- Opinions about technology use and mobile technology use for learning
- Importance of course structural features potentially used in classes to success in a class
- Approaches/features that instructors could incorporate with technology to better support academic success.

IV. STUDY RESULTS

A. Demographics

Eighty-seven percent of the participating students were junior or higher classification with a GPA greater than 2.50 (90%); thus, the participants were largely experienced, successful students. Most students were under 30 years of age (86%) and most were employed in either a full-time or part-time position (69%). Most of the students who completed the survey attended school mostly full-time (87%) compared to 13% who attended mostly part-time. Respondents were 48% women and 51% men. The students surveyed were also experienced in online learning in that 66% of them had completed at least three online courses while only 7% had completed no online course. Most students (48%) held a major in Computer Information Systems; some of the other majors represented included Retailing and Consumer Science (27%), and Biotechnology (11%).

B. Device Use

In order to examine in what contexts (academic versus non-academic) students use different types of ICT devices, students were asked to rate how they used four devices: desktop computers, laptop computers, tablet computers, and smart phones. They responded using a semantic differential scale that ranged from nonacademic use only to academic use only. They also had an option to report that they did not use the device at all. Results are presented in Table 1.

TABLE 1 TYPE OF USE BY DEVICE

	Type of Use by Device				Type of Use by Device Among Students Who Use the Device		
	Academic	Equal	Non-Academic	No Use	Academic	Equal	Non-Academic
Desktop	36%	36%	14%	13%	41%	41%	16%
Laptop	32%	61%	5%	1%	32%	62%	5%
Tablet	9%	19%	38%	34%	14%	29%	58%
Smartphone	4%	24%	71%	1%	4%	24%	72%

The data showed that the predominant use mode for students who used desktops was either using the device mostly for academic work or using it equally for both academic and nonacademic work. For student who used laptops, the predominant use mode was using the device equally for both academic and nonacademic work. For tablets, the predominant use modes were either mostly for nonacademic work or no use. For smartphones, the predominant use mode was using the device mostly for nonacademic activities. The device that was used most at least partly for academic work was the laptop, a portable device, with about 93% reporting that they either used it for academic work only or used it equally for academic and nonacademic work. Of all the students who responded to the survey, a little more than one third of them did not use tablets at all. After the tablet being the device most categorized as not used at all, the desktop ranked next in that category, with 13% of the students having reported that they did not use the desktop at all. This result is notable for this study since it meant that 13% of respondents used only mobile devices or laptops. While laptops are not considered mobile ICTs since they are not, in general, handheld with touchscreens, they are most definitely portable devices, where desktops are not.

Two survey questions targeted use of mobile or portable devices for the specific academic tasks of accessing course material and completing assignments. For these items, a Likert scale was used. Only 5% of the respondents disagreed with the statement, "I use mobile devices to access course materials." For purposes of the survey, mobile devices were defined as smart phones, tablets, and laptops. There was more variation in responses to the item, "I use mobile devices to complete course assignments." For that item, 19% disagreed, 12% were neutral and 69% agreed. These results are shown in Figure 1.

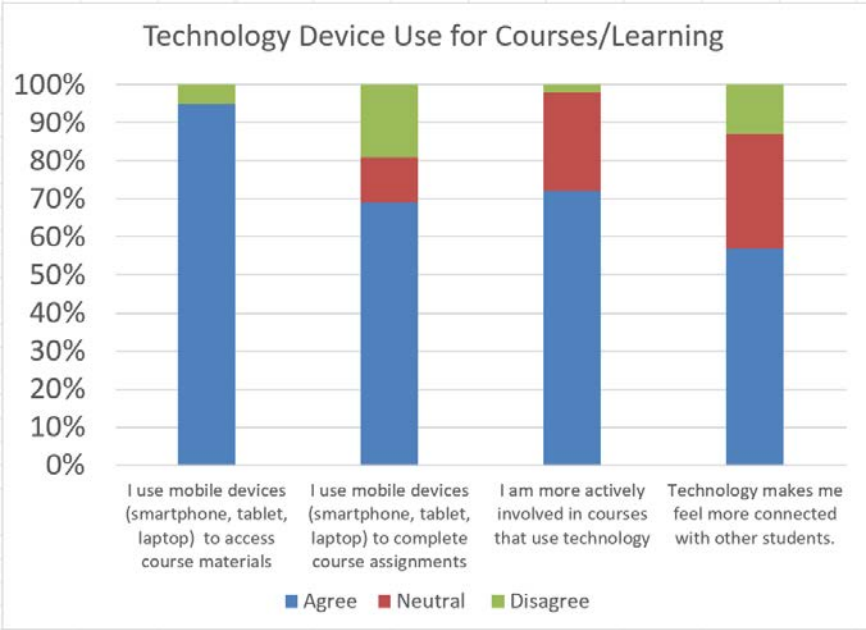

Figure 1 Technology device use for courses and learning

From the data analyzed, it appeared that students felt more connected to courses that use technology. In responding to the item "I am more actively involved in courses that use technology," 72% agreed with and only 2% disagreed with the statement. In addressing the item "Technology makes me feel more connected with other students," 57% agreed with and 13% disagreed with the statement.

C. Technology Features Used in Courses

The survey asked students about nine features involving technology that are frequently found in courses. The students were asked if they would like to see the feature used more (or less) in their classes. Features included were instructor lecture video use, external video content use (such as videos posted online at YouTube), computer games, computer simulations, student presentations related to course content, e-text content, online collaborative activities, online discussion activities and lecture activities with clickers. Students were asked to rate their preference for degree of use on a scale that ranged from 0 (prefer that the feature not be used at all) to 7 (prefer that the feature be used much more). Item means were computed and used to rank items based on student preference for use. The rankings based on item means are shown in Figure 2.

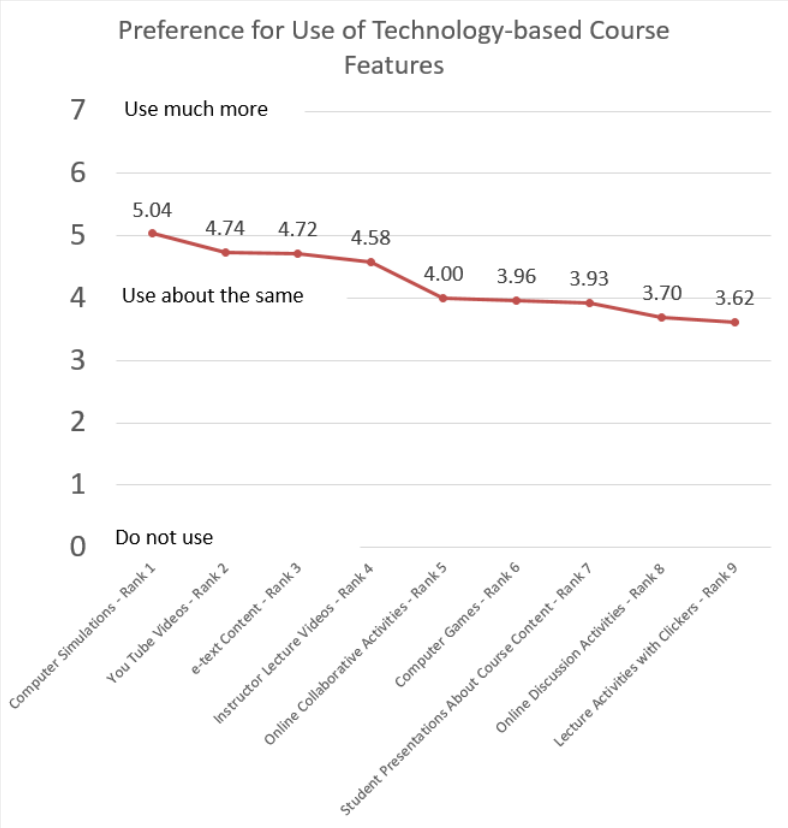

Figure 2 Technology features ranked by preference for level of use

The data support the students' enthusiasm, overall, for more use of technology-based features in courses. The course feature ranked highest by students as a candidate for more use in courses was computer simulation. They also showed high preference for video content and e-text content. Students were somewhat less enthusiastic about use of online collaborative activities, computer games and student presentations related to content. The features that were ranked the lowest were online discussions and lectures that used clickers.

D. Mobility of Technology-based Course Features

The researchers considered each of the nine course features ranked by student preference for more or less use. The additional thought was with respect to whether the feature could be used with a mobile device just as readily as it could be used with other devices that are not mobile devices. In this analysis, mobile devices included smart phones and tablets, while laptops were considered portable devices, and desktops were considered not portable. Table 3 shows the results of this analysis. The significance is that of the four highest ranked features, three are readily accessible with mobile devices. Of the five lower ranked features, there are hardware and software dependencies which would determine whether the feature was readily accessible through mobile devices.

TABLE 3 IS A TECHNOLOGY-BASED COURSE FEATURE READILY ACCESSIBLE USING A MOBILE DEVICE?

Rank by Student Preference for More Use	Feature	Readily Accessible through Mobile Device?	Discussion
1	Computer Simulations	Maybe	Software/hardware dependent, such as virtual reality simulations
2	Videos such as those on YouTube	Yes	Very easy to watch videos on a smart phone or tablet
3	e-text Content	Yes	Simple to make instructor-authored e-text content accessible with smart phones; an abundance of commercial e-text content is also available
4	Instructor Lecture Video	Yes	Fairly simple with many university IT departments able to stream video content
5	Online Collaborative Activities	Maybe	Software dependent; LMS enable this but LMS mobile interfaces vary in capability
6	Computer Games	Maybe	Simple games that do not require specialized hardware are delivered through mobile devices, few existing tools readily adaptable to customized content
7	Student Presentations re: Course Content	Maybe	Consuming such content is readily accessible via mobile device, but creating such content may require specialized hardware/software
8	Online Discussion Activities	Yes	Software dependent; LMS enable this but LMS mobile interfaces vary in capability
9	Lecture Activities with Clickers	No	Mobile phones can be used as clickers through an app, but synchronous participation in a lecture activity limits mobility with respect to time

E. Student Perception of Mobile Device Utility for Learning

To explore student perceptions regarding the utility of mobile devices with respect to learning and learning processes, students were asked to rate the extent to which they agreed that using mobile devices for learning enabled them to actively participate in the learning process, locate information from a wide variety of resources, integrate different ideas, learn from peers, or use different learning strategies. A scale was used with a value of 7 meaning they strongly agreed and a value of 1 meaning they strongly disagreed with the presented statement. Means were calculated for each item and used to rank the behaviors. This ranking is shown in Table 4.

TABLE 4: STUDENTS PERCEPTIONS OF BEHAVIORS RELATED TO THE USE OF MOBILE DEVICES FOR LEARNING

Rank	Using mobile devices for learning enables me to:	Mean
1	locate information from a wide variety of resources.	5.99
2	integrate different ideas.	5.48
3	use different learning strategies.	5.44
4	actively participate in the learning process.	5.38
5	learn from my peers.	4.87

From the rankings it appeared that, in general, students perceived that using mobile devices for learning enabled all activities they were polled about in the survey. The highest ranking activity for being perceived as enabled by the use of mobile devices for learning was locating information from a wide variety of resources. The students also agreed, but to a slightly lesser degree, that using mobile devices for learning enabled them to integrate different ideas, use different learning strategies, and actively participate in the learning process. The activity that students perceived that, to the least extent, was enabled by using mobile devices for learning was learning from peers.

F. Role of the Instructor in Learning with Technology

The survey also contained open ended items, one of which was, “What can your instructor do with technology to better support your academic success?” Student responses to the item were coded by the researchers to enable categorization by aspects of technology that students felt instructors could use to enhance instruction. For the categories that emerged, the researchers noted whether the category corresponded to something that is readily accessible through a mobile device, whether the category overlapped with the concept of mobility in some way, or whether the category

did not have anything to do with the use of mobile devices for learning. Descriptions of each category or examples of items that belong to a category are provided in Table 5. The descriptions and examples in Table 5 are derived from student response data. The categories and their ranking by students are shown in Table 6. The ranking value represents the number of times the concept represented by the category was mentioned in the responses to the open-ended question.

TABLE 5: RESPONSE CATEGORY DESCRIPTIONS/EXAMPLES

Category	Description/Example
Fully online course/content	Provide ALL content online. Prepare materials for every course as if it is being offered online.
Scaffolding for technology use	Provide instruction to help students learn to use the technology needed in the course.
Active learning with technology	Engage the students with activities that use technology to process, work with, and internalize course content.
Scaffolding for content	Provide examples and other elaborations of course content. Provide more than one content alternative for reaching understanding.
Instructor engagement	Be engaged with the course and the students through online interactions such as prompt response to student emails. Use social media to create an engaged instructor presence in the course.
Accommodate different learning styles	Provide videos as well as reading materials. Provide slide presentations and podcasts. Provide alternatives.
Competent technology use by instructor	The instructor should know how to use the technology present in the course.
Online integration	Integrate the course content with online content, such as online tutorials and articles.
Content relevant to workplace	Prepare materials that demonstrate how the content applies to the workplace.
Instructor-authored content	Use more instructor-authored content such as videos of lectures by the instructor as opposed to videos found on the Web. This was mentioned because instructor prepared content aligns closely with what the instructor expects the students to know for exams and assignments.
Mobile access	Create mechanisms for mobile access to the course.
Course layout/design	Create a course layout online that is easy to understand so that it is easy for students to find content items and other course elements and know when things are due.

TABLE 6: RANKING OF CATEGORIES BY NUMBER OF STUDENT RESPONSES PER CATEGORY

Category	n	Interaction with Use of Mobile Devices?	Discussion
Fully online course/content	56	Yes	Having all content online is the first step toward being able to access all content with a mobile device.
Scaffolding for technology use	41	Yes	Instructors may have to know whether their content is accessible through mobile devices and show students how.
Active learning with technology	31	Maybe	The survey indicated that students perceive that using mobile devices enables them to actively participate in classes, so there may be implications for student engagement.
Scaffolding for content	29	No	These comments had more to do with teachers providing sufficient scaffolding material.
Instructor engagement	18	Maybe	If instructors use communication technologies that students subscribe to and then access through mobile devices, the perception of instructor engagement could be enhanced.
Accommodate different learning styles	14	Maybe	A variety of content formats including reading, audio podcasts, and videos can be accessed through mobile devices.
Competent technology use by instructor	13	Maybe	If instructors want to facilitate the use of mobile devices by students, then they are going to have to understand how to make materials that are mobile-friendly.
Online integration	12	Maybe	In using existing online content, instructors will have to consider whether it is readily usable through a mobile device.
Content relevant to workplace	9	Maybe	If mobile devices are used for work activity, then helping students know how to use their mobile devices for learning will be relevant to their use in the workplace.
Instructor-authored content	8	Maybe	When preparing content, instructors need to prepare it in mobile-friendly formats.
Mobile access	5	Yes	Direct mention of mobility as an issue.
Course layout/design	3	Maybe	Consideration of layout/design of a course with respect to mobile device capabilities is important.

Also from the student responses to the open-ended items, a list was created of specific items students reported as a way that faculty use technology to promote student success. Items mentioned that pertain to the context of mobile device use are noted with a smartphone icon. The result revealed an abundance of items that student want that pertain to mobility. Overwhelmingly, the wording used in the open-ended responses fell into the category of "use more of …" this item. The specific items listed in Table 7, reported in terms the students used, were requested to be used more. The list, organized alphabetically within broad categories of Technology, Online, and Classroom, illustrates how broad the students' perception and understanding of course elements, features, and technology use for education was. It also shows the pervasiveness of student ideas that readily link to the use of mobile devices.

TABLE 7: THINGS TO USE MORE AS STATED BY STUDENTS IN RESPONSE TO "WHAT CAN YOUR INSTRUCTOR DO WITH TECHNOLOGY TO BETTER SUPPORT YOUR ACADEMIC SUCCESS?

Item to Use More/Technology	Item to Use More/Online	Item to Use More/Classroom
e-books	mobile online exams	active learning
electronic Q&A forms	e-contact	collaboration tools
interactive study guides	e-interaction	content relevant to real jobs
clickers	instructor e-reminders	demonstrations
screen sharing	interactive online-tutorials	Examples
simulations	online content alternatives	free content
user-friendly technologies	online homework	guided hands-on work
variety of technologies	online lectures	objectives for assignments
	online technologies	student engagement
	online tests	student-teacher communication
	online videos	test solutions
	resources online	resource apps
	synchronous online time with instructor	
	teacher-led blogs	

Student responses were recoded to examine broad categories of opportunities for instructors to support academic success. The categories that emerged were related to communication, subject matter immersion, and provision of examples and demonstrations, and the researchers considered each of these with respect to whether they are facilitated by use of mobile devices.

Regarding communication, students suggested that instructors use technology to quickly reply to student inquiries and to quickly return grade information. Mobile technology specifically was cited as a means to communicate with class members since students tend to frequently interact with their smartphones. Students also thought that frequent emails from professors could make classes seem more real as well as serve as reminders of class assignments. Students even suggested that they would benefit if faculty members would blog about course content. Collaboration was an aspect that students valued and that they felt could be enhanced through the use of technology. Collaboration tools specifically mentioned by students included Google Hangouts and Prezi.

For immersion, students wanted technology use to enable them to engage more fully with the course content. Suggestions made included interesting and effective course activities, activities involving group interactions, interactive use of mobile devices and clickers, faculty interaction with students via technology, simulations, and interactive tutorials. Closely related to students' desire to use technology to engage them in the content were their requests for content examples and demonstrations. Hands-on experiences were seen as a visual way for the instructor to know what students do and do not understand. Demonstrating content and showing step-by-step processes, as well as incorporating videos of such were desired. Students reported that videos would make learning easier and more fun. YouTube videos related to the coursework were seen as a means to facilitate comprehension of information from a different perspective. An interesting request from students was for examples and videos of the work of previous students. Another aspect of some suggestions related to the precision with which content presentation mapped to assessments. Students do not want more content for content's sake; they want it to be content focused on the knowledge and skills that will be assessed in the course.

Finally, in addition to the three categories described above (communication, immersion, and examples/demonstrations), students commented on the need for instructors to be competent in and to use the latest technologies and devices and then, when requiring students to use a specific technology, to demonstrate it and allow students to have hands-on practice applying it.

V. Summary, Conclusions and Recommendations

Students in this study valued the use of technology to support their learning. They found some applications of technology more useful than others and, in general, proposed the use of more technology to facilitate their success.

Mobile devices were specifically mentioned and the researchers believe the results indicated a student desire for more mobility through technology to create more course immersion and engagement. The device that was used most at least partly for academic work was the laptop, a portable device that they used either for academic work only or equally for academic and nonacademic purpose. While laptops and desktops were used for academic work, Tablets and Smartphones were predominantly used for nonacademic work.

The data support the students' enthusiasm for more use of technology-based features in courses. The course feature ranked highest for more use by students was computer simulation. They also showed high preference for video content and e-text content. Students were less enthusiastic about online collaborative activities, computer games and student presentations. The features that were ranked the lowest for more use were online discussions and lectures that used clickers.

Among the course features ranked highest by the students, three of the four highest features were readily accessible with the use of mobile devices. Of the five lower ranked features, as well as the highest ranked feature, there are hardware and software dependencies which could determine whether the feature was readily accessible through mobile devices. Furthermore, students perceived that using mobile devices for learning enabled all activities with the highest ranking activity as locating information from a wide variety of resources. To a lesser degree, students indicated that using mobile devices for learning enabled them to integrate different ideas, use different learning strategies, and actively participate in the learning process. The activity that was not strongly supported was using mobile devices for learning from peers.

Faculty members and instructional designers can use these findings to examine and apply the specific technology and course structural features examined, while keeping in mind the student desire to engage with mobile devices.

Future investigation would be useful to expand the application of these findings. While the use of technology at the university in the study is likely similar to that of other institutions, no assumptions for extending these results to other applications should be made without further investigation. Case studies illuminating the benefits and challenges of using mobile devices, both from the standpoints of student use and faculty preparation of materials, would be useful.

APPENDIX A: SYNOPSIS OF SURVEY ITEMS

Section: Use
Rate how you use the device.
Scale for all items in section:
a. 7 academic use only
b. 6
c. 5
d. 4 equal academic and non-academic use
e. 3
f. 2
g. 1 non-academic use only
h. 0 I do not use this device at all
Items:
→ desktop computer
→ laptop computer
→ iPad or other tablet computer
→ smartphone

Section: Course Features
Would you like to see the following course feature used more (or less) in classes?
Scale for all items in section:
a. 7 much more
b. 6
c. 5
d. 4 about the same
e. 3
f. 2
g. 1 much less
h. 0 I prefer that the feature not be used at all
Items:
→ instructor lectures captured as videos
→ content-related videos from YouTube (or another free online source)
→ computer games
→ computer simulations
→ student online presetnations of content related to the course
→ e-text content (e-books, online articles, online content to be read)
→ activities (such as assignments) that involve online collaboration
→ online discussions among course participants (students and teachers)
→ lectures with response clickers

Section: Importance of Course Features
How important is the following course feature to your success in the class?
Scale used for all items in section:
a. 7 very important
b. 6
c. 5
d. 4 neutral
e. 3
f. 2
g. 1 not important
h. NA
Items:
→ Contact information for technical support
→Prompt response to e-mail by instructor
→ Assignment grades within a week
→Instructor-initiated technology use
→ Student-initiated technology use

Section: Technology for Learning
Mark the rating that best describes the extent to which you agree with the statement.
Scale for all items in section:
a. 7 strongly agree
b. 6
c. 5
d. 4 neutral
e. 3
f. 2
g. 1 strongly disagree
Items:
→ I am more actively involved in learning that uses technology.
→ Technology makes me feel more connected to other students.
→ Use of technology by a lecturer is distracting to me.
→ Use of technology by students during a lecture is distracting to me.
→ I use mobile devices to access learning materials. Mobile devices include smartphones, tablets, and laptops.
→ I use mobile devices to complete course assignments. Mobile devices include smartphones, tablets, and laptops.
→ Using mobile devices for learning enables me to actively participate in the learning process. Mobile devices include smartphones, tablets, and laptops.
→ Using mobile devices for learning enables me to locate information from a wide variety of resources. Mobile devices include smartphones, tablets, and laptops.
→ Using mobile devices for learning enables me to integrate different ideas. Mobile devices include smartphones, tablets, and laptops.
→ Using mobile devices for learning enables me to use different learning strategies. Mobile devices include smartphones, tablets, and laptops.
→ Using instructor-initiated technologies for courses now will help me with lifelong learning.
→ Using self-initiated technologies for courses now will help me with lifelong learning.
→Using mobile devices for courses now will help me with lifelong learning.
→ Using mobile devices for learning enables me to learn from my peers. Mobile devices include smartphones, tablets, and laptops.

Section: Open-Ended Response
Items:
→ What could your instructor do with technology to better support your academic success?
→ What could the University or College do with technology to help you engage in lifelong learning?
→ What could you do with technology to help you engage in lifelong learning?

Section: Demographics
Items:
→ Classification
→ Number of prior online classes
→ Full time vs. Part Time student
→ Age
→ GPA
→ Employment
→ Gender
→ Major
→ Portion of online enrollment

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