

Report On The 2011 Penn State World Campus Technology Use Survey

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Since Penn State officially entered the eLearning arena in the late 1990s with the launch of its World Campus, enrollments in its web-based courses have increased dramatically. Penn State World Campus has grown to be Penn State's second largest campus, serving adult students studying at a distance with online courses and programs that use a wide variety of rich media. More than 80 online degree and certificate programs are available, serving more than 11,000 students across the nation and around the world. The average age of a World Campus student is 34, higher than the age of traditional college students.

While the University knows a good deal about the technology use of its residential students through participation in studies such as the *ECAR National Study of Undergraduate Students and Information Technology*¹, little information has been known about the technology use and ownership of the University's World Campus students. To address this gap, an online survey was conducted in November 2011 to gauge the technology use and ownership of Penn State World Campus students. The results of the survey provide needed information about how adult learners studying at a distance incorporate technology into their daily lives, educational experiences, and pursuits. This information is extremely useful in the design and development of online courses, ensuring that our online learning environments reflect the technology access of our students and provide them with tools that they need to be successful in their educational endeavors. Given the diverse nature of Penn State World Campus's student population, this information is also of value to other institutions interested in technology use trends among adult learners.

METHODOLOGY

An online survey was administered in November 2011 to 7,449 Penn State World Campus students. Students were invited via email to complete the survey, which required authentication against Penn State's Access Account. Two email reminders were sent to students who had not completed the survey at approximately one-week intervals to encourage response. A total of 1,241 surveys were returned, representing a response rate of 16.7%.

The survey consisted of 28 core questions, designed to ascertain types of technology used by students, the purposes for which they are used, and frequency of use. Technologies referred to both hardware and software. Many questions directed students to "Check all that apply," allowing students to demonstrate a range of technological use. Following questions directly related to technologies, participants were asked to respond to statements designed to tease out opinions they hold about the efficacy of online learning.

¹ See http://tlt.its.psu.edu/about/reports/2011/2011%20ECAR%20Survey.pdf/at_download/file

FINDINGS

Student ownership and use of technology

As new online courses are developed and existing courses are updated, it is important to consider the technology that students have available to them. Similar to the ECAR surveys of Penn State's residential students in Spring 2011 and 2012, the Fall 2011 World Campus Technology Use Survey study asked Penn State's World Campus students to indicate whether or not they own specific technology devices. The results reveal an interesting comparison of technology ownership between the University's residential and online students. It should be noted that the ECAR surveys only addressed Penn State's residential undergraduate population, while the World Campus survey included both undergraduate and graduate students studying at a distance.

Figure 1 shows a comparison of the findings among the Spring 2011 ECAR, Fall 2011 World Campus, and Spring 2012 ECAR surveys. As shown, ownership of both desktop and laptop computers was higher among World Campus students than Penn State's undergraduate residential students in 2011, a finding that makes sense considering World Campus students take their courses online. Interestingly, 41% of World Campus students owned a small netbook, notebook, or tablet computer in late 2011, compared to just 12% of Penn State's undergraduate residential students earlier that same year. As indicated by the 2012 ECAR results, the popularity of tablet computers is on the rise. We would expect to see these percentages rise for World Campus students in 2012, as well. Ownership of a dedicated eBook reader is also on the rise among Penn State's undergraduate residential students. One would also expect to see that same trend for World Campus students in 2012.

Student Technology Ownership			
	ECAR March 2011	World Campus November 2011	ECAR March 2012
Desktop Computer	43%	60%	31%
Full-size Laptop Computer	92%	91%	98%
Small Netbook/Tablet Computer	12%	41%	89%
Dedicated eBook Reader	7%	25%	95%
Smart Phone	60%	78%	99%
Cell Phone		99%	
iPod		55%	
Portable MP3 Player (not iPod/cell)		18%	
Webcam (both "built in" and "USB")		93%	

Figure 1

In addition to the ownership of some type of computer, our study sought to learn more about student ownership of devices such as cell phones, portable MP3 players, and webcams. Knowing how likely a student is to own these devices informs the selection of appropriate educational technologies when designing online courses. We found that approximately 99% of World Campus students own a cell phone,

most commonly running the Android, iOS, and Blackberry operating systems. However, 14% of these students are not able to access the Internet from their cell phones, while another 11% have cell phones capable of Internet access but choose not to activate that feature. Figure 2 shows a breakdown of the operating systems students' smart phones are using.

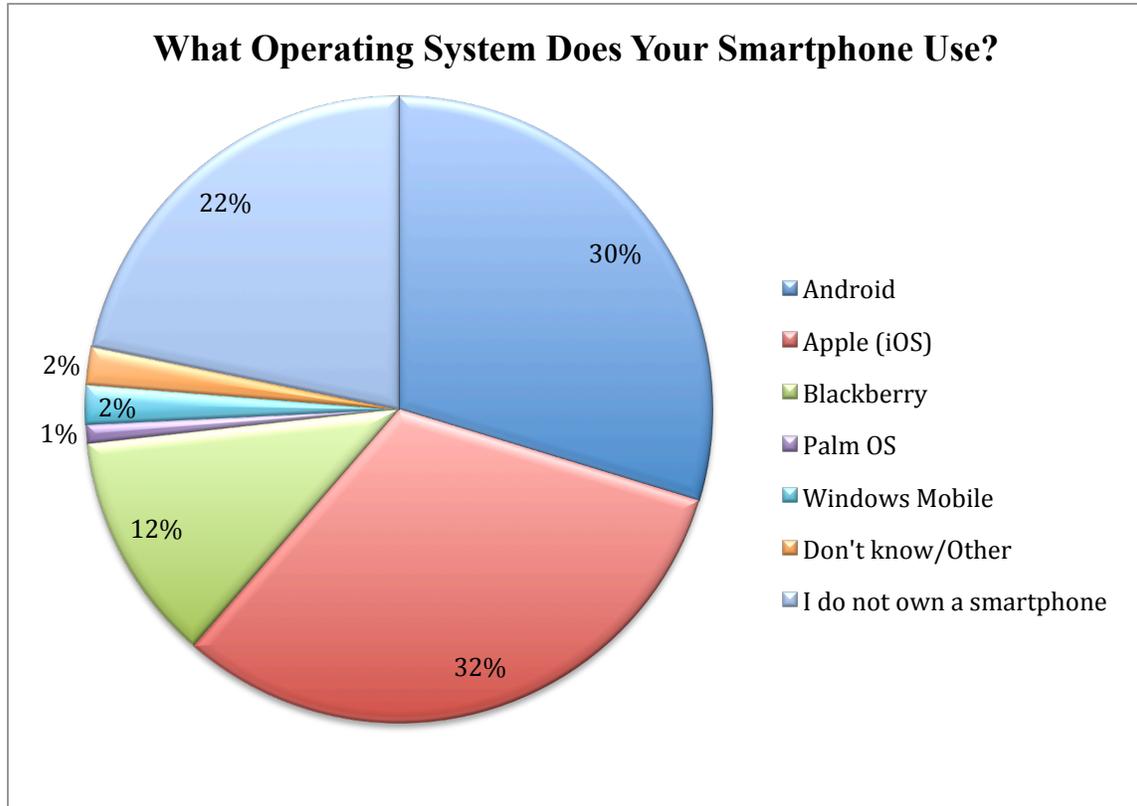


Figure 2

Other popular mobile tools are portable MP3 players and iPods. These devices are useful for listening to course-related podcasts while on the go. Ownership of iPods was high among World Campus students at 55%. An additional 18% of students own an MP3 player that is not an iPod or cell phone.

Having access to a web camera ("webcam") and a headset (microphone and earphones) can be useful for participating in synchronous online discussions, seminars, and collaborative activities. Data revealed that 93% of World Campus students own either a built-in or USB webcam and 65% own a headset.

Knowing how students use technology is another important piece of the puzzle. With interest in mobility on the rise, our survey sought to better understand what students currently do with their cell phones (shown in Figure 3) and what kinds of academic activities they would like to be able to do on mobile devices in general (shown in Figure 4). As we work to make Penn State's online courses more "mobile-friendly," the latter is valuable information that learning design units can use to prioritize development needs.

Top Ten Things Students Do With Their Cell Phones	
Make Phone Calls	98%
Text	93%
Take and Send/View Photos	81%
Send/Receive e-Mail	69%
Use GPS/maps or Get Directions	59%
Receive Text Alerts	56%
Social Networking	53%
Access the Web	53%
Play Games	50%
Listen to Music	49%

Figure 3

What Students Would Do With Their Cell Phones for School	
E-mail My Instructor	62%
Look Up Contact Information	57%
Receive Text Announcements and Updates	52%
Check Course Syllabus	48%
Read Course Materials	39%
Register for Courses	34%
Ask an Advising Questions	33%

Figure 4

Finally, given the growing interest in educational gaming observed in the educational technology community, it was noteworthy that 42% of respondents indicated that the “do not play games” when asked, “If you play games, on what platform do you normally play?” Unfortunately, the response options included the Nintendo DS/DSi/3DS (7%), Sony PSP (3%), iPhone/iPod Touch/Android (35%), and “Other mobile phone” (5%). The survey did not provide a response option where students could indicate that they played computer-based games. A respondent who plays computer-based Solitaire, for example, may have indicated that he or she did not play games. Therefore, the number of respondents who do play games on electronic devices may actually be higher than our findings indicate.

Computer Use

When considering student technology use and ownership, a familiar focus is the personal computer. Students were asked a number of questions pertaining to computer operating systems, self-perceived level of expertise, and the types of activities in which they engage.

When asked what operating system students used for course work, 87% reported using Windows machines and 23% reported using Macintosh. Few students, just 4%, used Linux. World Campus undergraduate and graduate students reported similar use of these platforms.

Respondents largely saw themselves as average to above-average computer users. Of the 1,138 students who responded to this question, 37% percent saw themselves as above average and 61% saw themselves as average. Only 2% of respondents saw themselves as a computer novice.

The most popular activities on the computer were creating and editing documents (99%), reading and answering email (98%), reading course materials (94%), shopping online (93%), and managing photos, videos, and music (92%), as seen in Figure 5. It was also interesting to learn how students did *not* use their computers. Of particular interest, only 10% of the respondents connect to virtual worlds such as Second Life and, surprisingly, only a quarter (24%) blog (Figure 6).

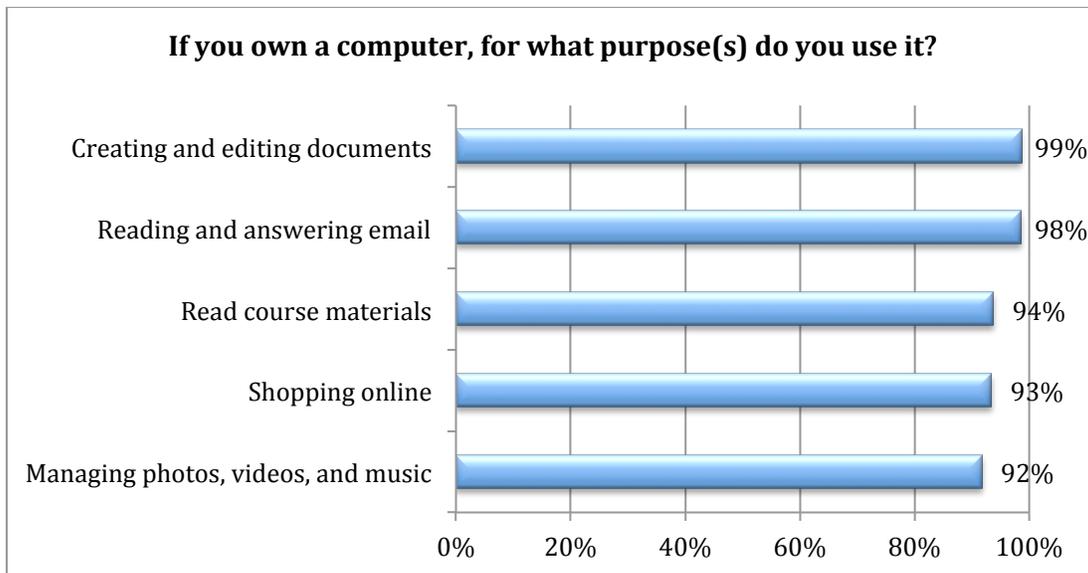


Figure 5

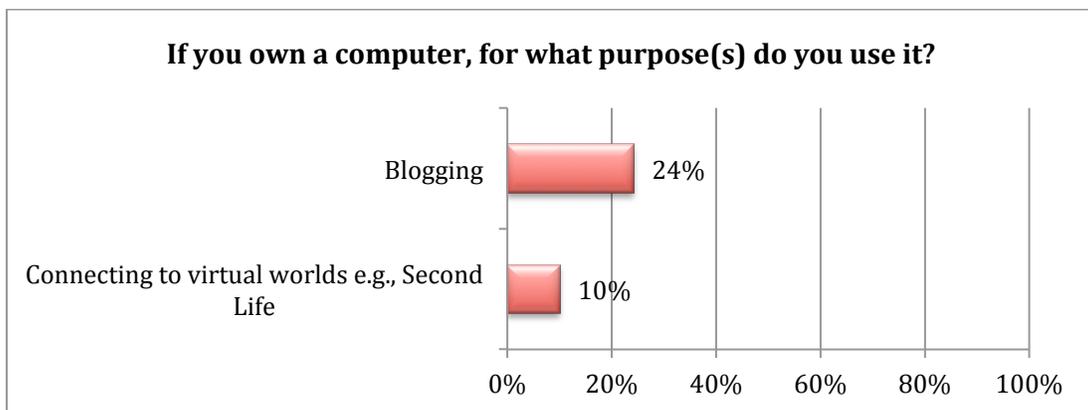


Figure 6

Students were also asked about their use of anti-virus and anti-spyware software on their computers. Approximately 10% of students did not have anti-virus or anti-spyware/adware software, or weren't aware that they did. A majority of students allow their anti-virus and anti-spyware software to update automatically (75% for anti-virus software, 67% for anti-spyware/adware software).

Internet Usage

In addition to learning more about the technology devices students own, this study sought to better understand how World Campus students use Internet-based technologies. Students surveyed were presented with a list of computer and web-based activities and asked how often they engaged in them. Results indicate that, as far as Internet usage is concerned, World Campus students remain primarily consumers of information rather than creators. As shown in Figure 7, they do *not* tend to create or update web pages, create or listen to podcasts, create or make entries to a blog, participate in wikis, create digital animations, or maintain personal e-portfolios. They do, however, use the Internet to do research and to find information. In this way, students seem to still be in "Web 1.0" mode, where they consume information but do not see themselves as information creators.

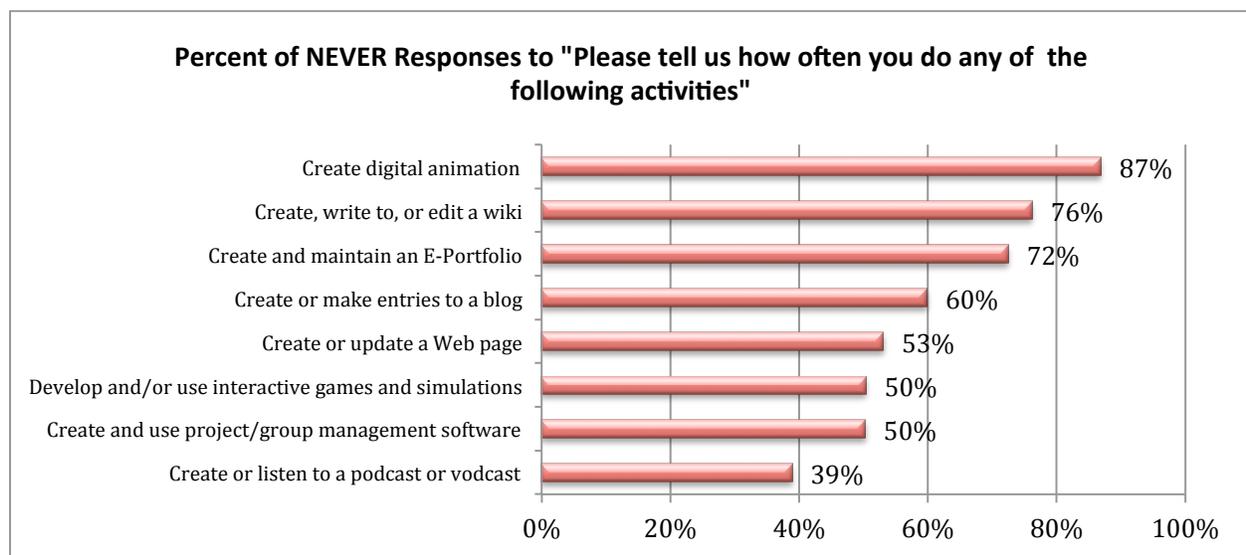


Figure 7

Students were also asked, "Which of the following services have you used since you became a student at Penn State?" and then given a list of web-based services ranging from the University's course management system (ANGEL) to University blogging tools. ANGEL, eLion (a web-based service for students, advisers, and faculty that allows secure, real-time access to the University's academic and financial records), and Web Mail (the University's web-based email application) were the three services used most frequently by students (see Figure 8). These services are administrative or functional in nature, rather than services that provide students with creativity tools designed to assist them in accomplishing their learning goals.

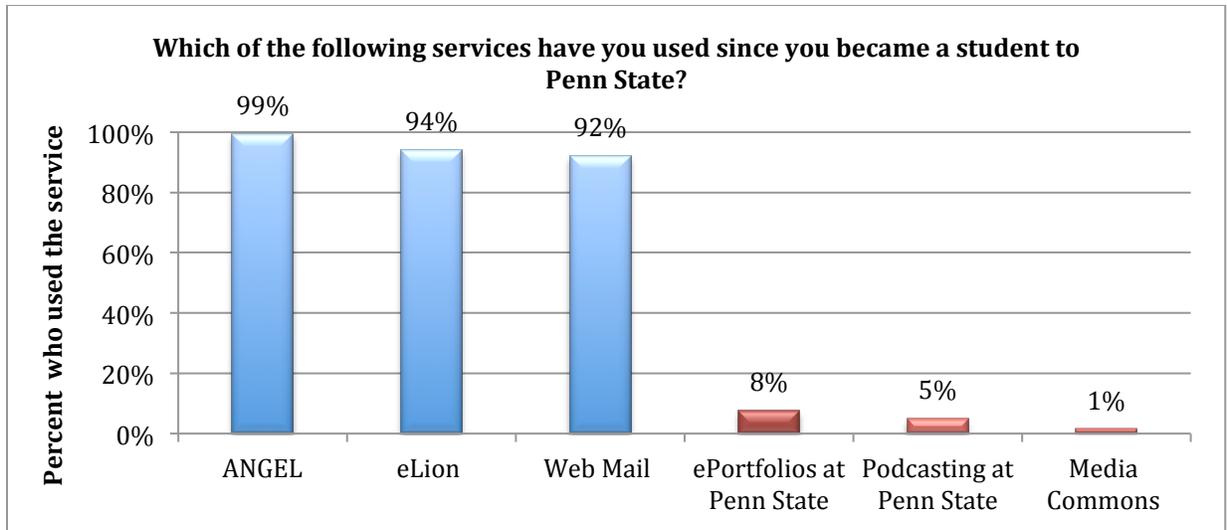


Figure 8

Services least used further support the perception that students are consumers rather than creators of information. Of all University services, only 1% of respondents reported using Media Commons², 5% of students reported using podcasting creation tools, and 8% reported creating ePortfolios to chronicle their achievements.

This study also explored how students use the Internet to work on their assignments. Findings show that World Campus students tend to use general Internet resources more often than they use library resources for research. While 92.5% use the Internet daily or weekly for research, only 50.5% use the library daily or weekly.

When creating multimedia projects and other assignments using electronic resources, our students do not appear to know whether those resources are copyrighted or carry Creative Commons³ licensing. Nearly 60% of respondents said they did not know if the materials they were using had a Creative Commons license or not. In addition, only 19.5% stated that they asked permission to use copyrighted materials in their multimedia projects or assignments.

The survey also addressed how students use the Internet to engage in other types of activities. Students were asked to indicate the frequency in which they engage in 19 online activities, with options of “never, yearly, monthly, weekly, or daily.” Figure 9 shows the top activities in which respondents engage on a daily basis, while Figure 10 shows the top activities in which respondents *never* engage. Knowing what students do and don’t do online can be useful information to faculty when designing online learning activities for their courses. However, this should be done with caution—just because a student engages in a given online activity does not necessarily mean that the student would want to participate in that activity

² Media Commons is a university-wide initiative to enrich the teaching and learning experience through multimedia technology, classroom training and direct support for students, faculty and staff.

³ Creative Commons is a nonprofit organization that enables the sharing and use of creativity and knowledge through free legal tools. See <http://creativecommons.org/about>

for an educational purpose. It can, nonetheless, suggest what kinds of online activities their students may or may not already be familiar with before taking their course.

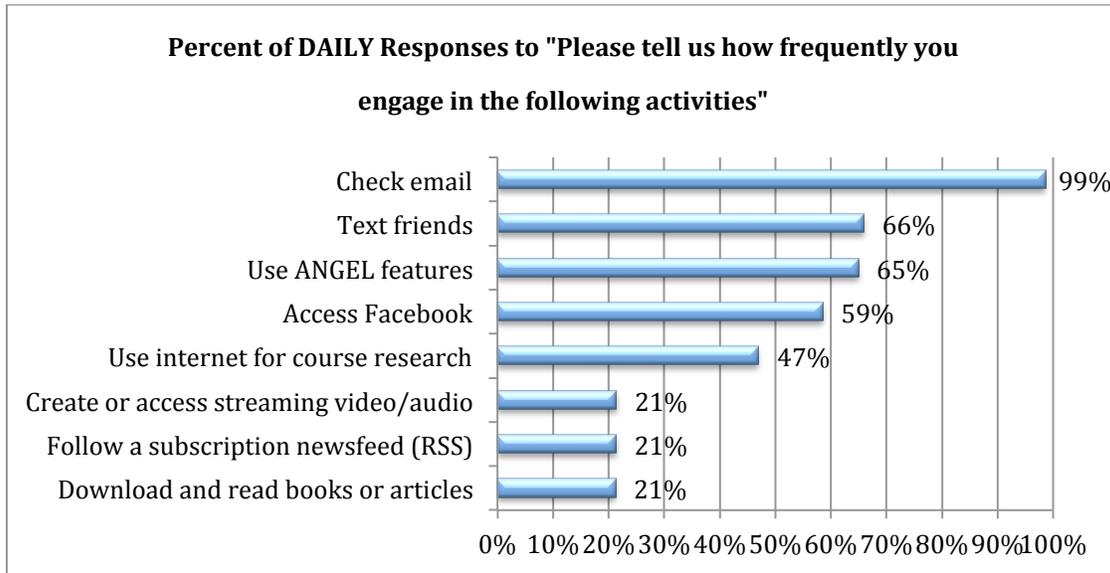


Figure 9

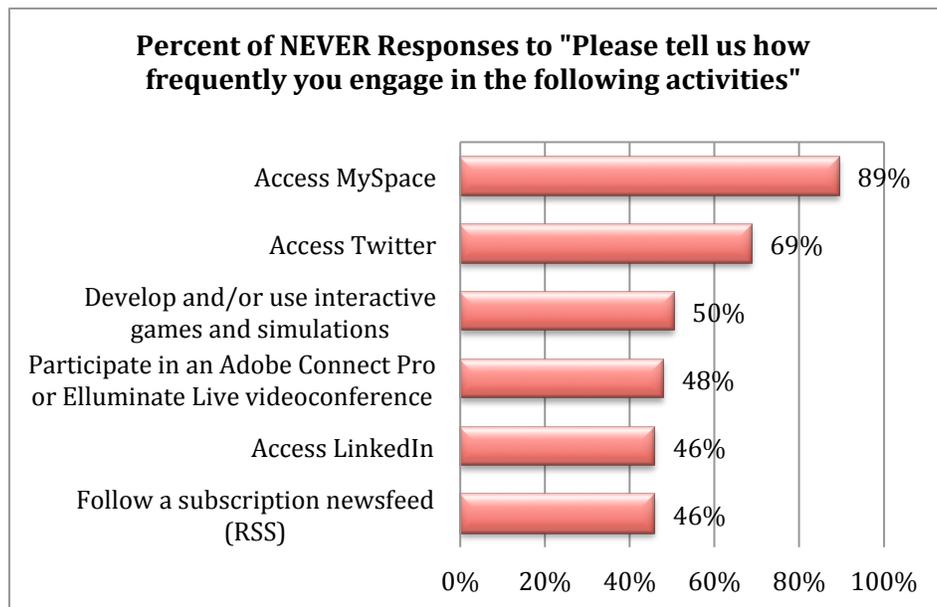


Figure 10

Learning Preferences

The results discussed above provide a good deal of information about the general technology ownership and use by World Campus students, from which implications might be inferred that relate to the use of technology for formal educational purposes. To make more concrete inferences of this type, this study also included a number of questions that related to how students choose to use technology specifically for learning. Such questions addressed student preferences for learning technology and software skills, as

well as engaging in educational activities such as team collaboration, research, and reading, listening to, or viewing computer-based lectures.

Learning technology and software skills

When asked how they prefer to learn technology and software skills, the top three responses were to 1) learn it by doing/using (95%), 2) get help from friend/peer/classmate/family (63%), and 3) do ad hoc searches on the Internet (58%). This suggests that for learning technology and software skills, these types of active learning activities are preferred over passive learning ones, such as attending face-to-face instruction or reading documentation.

Collaboration

Not surprisingly, results revealed that World Campus students use email (88%) and ANGEL (66%) to collaborate on teamwork more often than any other method. In addition to the collaboration tools shown in Figure 11 below, Second Life, MySpace and Twitter were also options available for choice in this question. However, fewer than ten students selected those options.

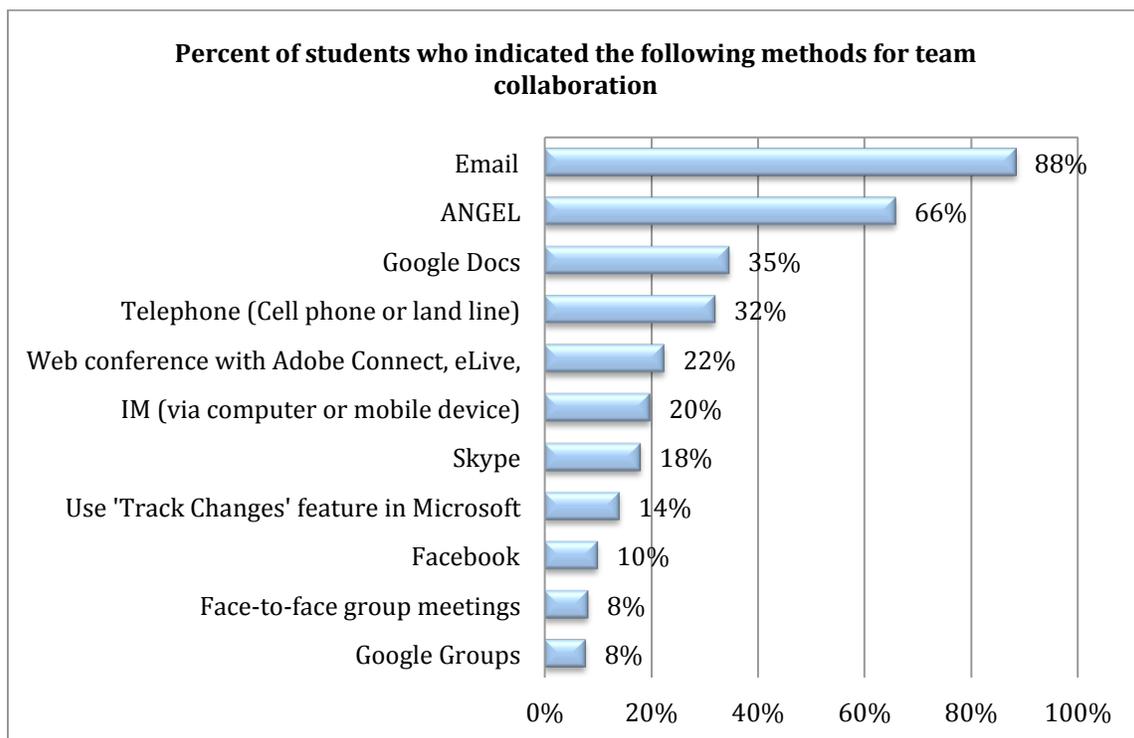


Figure 11

Managing references and citations

Building bibliographies and managing references or citations are a critical task in research and likely to be required as part of many course assignments. Interestingly, the majority (65%) of students indicated that they do not use an electronic reference or citation tool, suggesting that these tasks are primarily done manually. Several students did report using reference books or Microsoft Word documentation on how to reference material as sources of information.

Reading, listening to, or watching course lectures

Survey questions also asked students to indicate their agreement with the following statements: “I prefer my course readings to be in printed format (textbook, readings packet, etc.)” and “I prefer my course readings to be online (digital resources).” As Figures 12 and 13 show, the percentages of students who agree or strongly agree to these statements is close, with a small preference for digital resources over printed resources, 46% versus 43%.

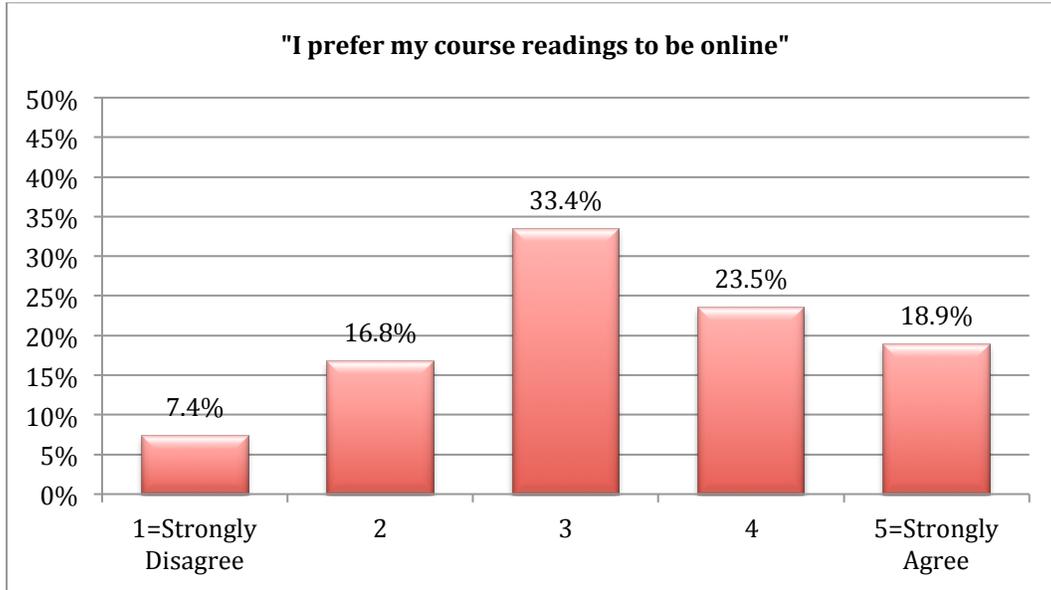


Figure 12

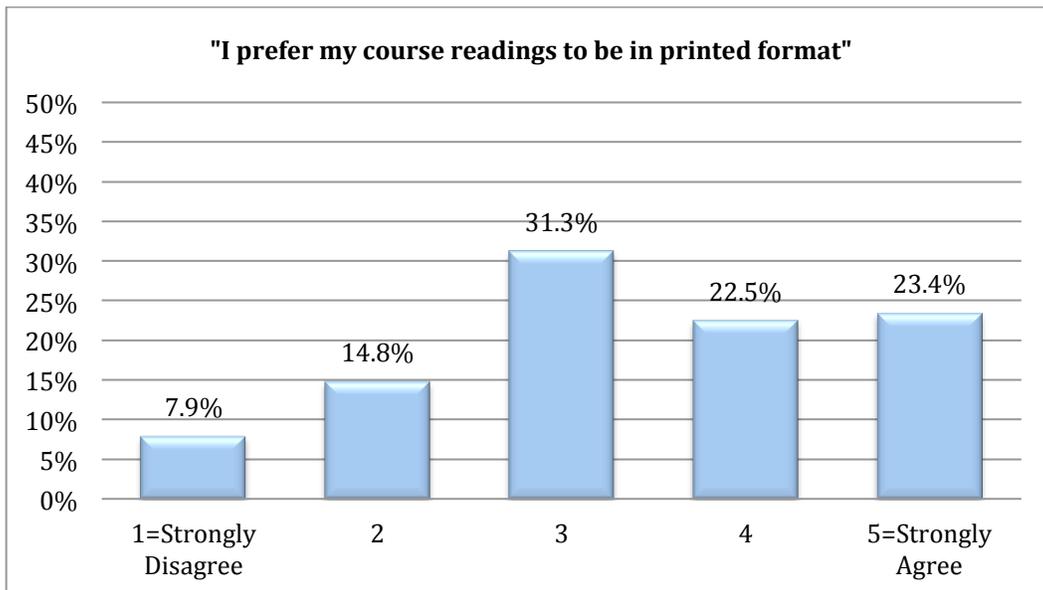


Figure 13

In addition to exploring students’ reading preferences, the survey also about students’ podcast listening and viewing preferences. At the time of the survey, approximately 20% of students reported listening to

or viewing podcasts (digital audio or video files or recordings that can be downloaded from a Web site to a media player or computer) on their cell phone. When asked, “If podcast lectures were available for your courses, would you listen to them?” 87% responded that they would do so.

Distance Learning Perceptions

The survey concluded with nine statements related to beliefs and attitudes toward online learning. For ease of reading, Figure 14 presents the findings arranged in order of agreement. Note that this is not the order in which the statements appeared on the survey. The majority of students believe that taking an online course requires more time than a traditional face-to-face course and, conversely, only 11% believe that face-to-face courses are more work than online courses. In fact, 63% disagreed or strongly disagreed with this statement, with 25% rating this statement a 3 on the 5-point scale.

The majority of students liked participating in online discussion forums and sharing ideas online with classmates whom they had not met in person. Not surprisingly, the majority of students do not like participating in online, real-time discussions. Only 28% agree with that statement, with 40% disagreeing or strongly disagreeing with it. This suggests that online students are more interested in asynchronous learning, allowing their schedules to dictate the times at which they study.

Statement	Percent who agree or strongly agree with statement
I believe that taking a course online takes more time than taking one face-to-face	58% (n = 1233)
I like participating in a discussion using an online discussion forum	53% (n = 1233)
I like sharing my ideas, thoughts, and opinions online with classmates whom I have never met in person	53% (n = 1233)
Knowing I am part of a class or group is important to me	41% (n = 1232)
I like participating in online, real-time discussions, e.g., Skype, chat	28% (n = 1230)
I believe I learn better in face-to-face courses than online courses	23% (n = 1235)
I believe online courses do not have many team activities	16% (n = 1228)
I believe more students will cheat on assignments or tests given online than in a face-to-face class	11% (n = 1236)
I believe face-to-face courses are more work than online courses	11% (n = 1234)

Figure 14

IMPLICATIONS

Findings from this study have a number of implications for the way that we design and deliver online courses. With the rise in the ownership of mobile devices, it was of particular interest that results revealed that approximately 25% of World Campus students either choose not to access the Internet from their phones or are not able to do so. This indicates that we are not yet at a point where we could require mobile-based learning activities without financially impacting a large percentage of our students. Given the rise in popularity of mobile devices, however, it may be that this situation will change dramatically within the next few years. Working now to increase the mobile-friendly nature of our courses and administrative processes will help the University prepare for an inevitable rise in demand for mobile access.

Looking at the top five desired academic uses for mobile devices reported by World Campus students, all five are activities that could be handled by a mobile-friendly learning management system (LMS). Penn State is already undertaking a mobile pilot of its LMS (ANGEL) during the 2012-13 academic year, which is a positive step in this direction. Further analysis of the results related to cell phone and mobile use indicate that we should use text messaging more effectively with our World Campus students. More than 50% of World Campus students already sign up for text alerts on the mobile devices and more than 50% indicated that receiving text alerts is a desired academic use for their phones.

Findings also suggest a strong case for making podcast lectures available to students for use on mobile devices. It should be noted, however, that students were not given any information about the potential length of the podcasts when asked if they would listen to them on a mobile device. Having that information might have made a difference in the responses. For example, listening to or watching a one- or two-hour lecture is quite a different experience than it would be if the material were only five or ten minutes in length.

Related to decisions about making course materials mobile-friendly is the consideration of whether to provide course readings in digital or printed format. This study found that eReaders were only owned by 25% of World Campus students, indicating that digital readings still need to be provided in formats that can be viewed on a large variety of devices, including personal computers, and also in print.

Survey results also suggested ways to engage students synchronously. The high percentage of students who already own a webcam (93%) and a headset (65%), along with the low cost of these devices, suggests that engaging in live online interactions, such as discussions or even office hours, would be technically feasible for World Campus students. However, this survey found that the majority of World Campus students do not like engaging in synchronous course discussions. The flexibility that distance learning can provide with regard to the time and place of study should be taken into account when considering whether to include synchronous activities in online courses. Respondents indicate that, for collaboration purposes, World Campus students continue to use e-mail and the LMS as their primary tools for engaging with one another.

Looking at ways that World Campus students create their own course-related materials, this study found that these students are largely consumers of information, not information creators. These findings further point to a clear need to increase students' knowledge regarding the proper use of others' materials in their

own work. There continues to be a need to educate students about copyright, Creative Commons licensing, and the appropriate use of text and multimedia in their projects.

CONCLUSION

While this study revealed valuable information about World Campus student ownership and use of technology, an analysis of the findings, especially when compared to the 2012 ECAR findings, lead to even more questions about trends in these area. This study provided baseline information that will be instrumental in informing future surveys of this kind. Plans are already underway to align a survey of World Campus student technology ownership and use of technology with future ECAR surveys to better compare and contrast trends.

An analysis of findings has revealed flaws in the survey design that will need to be addressed for future use. For example, this study found that gaming does not be a "normal" activity for more than half of World Campus students, despite a strong interest in the instructional technology community in the "gamification" of education. Our survey question regarding gaming was, in hindsight, flawed in that it did not include casual games such as those played directly on the computer. Future surveys should provide an option for "computer-based games" to better reveal the extent to which World Campus students engage in gaming activities. Likewise, the question asking students "If podcast lectures were available for your courses, would you listen to them?" (with only Yes or No response options) should be modified to provide response options that indicate varying lengths of podcasts to better inform the development of these kinds of resources. These and other issues related to survey design will be addressed when aligning this survey with future ECAR surveys of Penn State students.

Penn State is not alone in its strong interest in online learning. According to the Sloan Foundation report "Going the Distance: Online Education in the United States, 2011," 65% of higher education institutions now say that online learning is a critical part of their long-term strategy.⁴ As online offerings continue to grow for both residential and distance learners, surveys of the technology use and ownership of these student populations will provide us with valuable information to inform learning design. Faculty who teach online courses and instructional designers who support them should be part of the conversation surrounding survey design and analysis in order to ensure that the right questions are being asked and that findings have a positive impact on online teaching and learning.

⁴ See http://sloanconsortium.org/publications/survey/going_distance_2011