

Technology and College Students: What Faculty Members Think About the Use of Technology in Higher Education

Omer Faruk ISLIM [1] , Nese SEVIM CIRAK [2]

[1] Ahi Evran University, Faculty of Education, Department of Computer Education and Instructional Technology, Kirsehir, Turkey
omerfarukislim@ahievran.edu.tr

[2] Mehmet Akif Ersoy University, Faculty of Education, Department of Computer Education and Instructional Technology, Burdur, Turkey
nsevim@mehmetakif.edu.tr

ABSTRACT

Tablet PCs especially iPads are one of the most commonly used devices that most educational institutions from elementary school to colleges have been using as a main or supplementary part of their educational system. This article aims at investigating faculty members' personal and educational use of technology especially iPads, their opinions on educational use of technology, and their students' technology competency. This study was conducted at a college of education in the Southwestern United States where a technology initiative was carried out and iPads were distributed. In this qualitative research, case study research was utilized as a research method and a purposeful sampling method was employed. The data were obtained from eight faculty members via semi structured interviews. Results of the study show that faculty members own a variety of devices in addition to iPad, and they are using many apps based on the class needs. Almost all faculty members define themselves and their current students as technology competent, and they stated that experience, socioeconomic status and willingness to use the technology are the main factors affecting technology competence.

Keywords: *faculty members, technology in higher education, technology use*

INTRODUCTION

Technology has become a main component of our daily life for a long time (Halac & Cabuk, 2013; White & Manton, 2011). Mobile devices especially have become a ubiquitous part of our daily life that shapes our habits. Along with the changing habits, institutions have been reshaping their educational systems to meet the needs of both learners and teachers as they try to integrate the latest technology into classrooms (White & Manton, 2011). For example, mobile devices have been used widely in all stages of the educational system for different purposes (Hunsinger et al., 2008). Such devices allow students to interact with their friends and instructors and access course content whenever and wherever they choose (Kukulka-Hulme & Shield, 2008; Nihalani & Mayrath, 2010). New technologies such as student response systems or the new applications work on both mobile devices and PCs to increase the limited instructor-student and student-student interaction even in crowded classrooms (Kenwright, 2009; Lantz, 2010; Sevan & Robinson, 2011). As Rodriguez (2011) stated, the combination of mobile devices and social media, free web tools especially, support interaction between students and each other and their instructor, hence increasing learning.

One of the most common mobile devices, tablet PCs have been integrated into the educational environment since they were launched in 2002. Tablet PCs have become so popular in a short time for several reasons. One of the biggest advantages of the tablet PC is that, like the notebook, it allows people to write and draw directly on the screen by just using a digital pen (Wise, Toto, & Lim, 2006) and so it has attracted attention of all age groups from toddlers to adults as well as educators. Tablet PCs bring several advantages to both educators and students. Firstly, using tablet PCs in educational settings is more efficient compared to using blackboards or developing PowerPoint slides. Unlike PowerPoint slides, in tablet PCs educators easily draw what they want and spend less time drawing directly to the screen. Moreover, they can re-use their

writings and drawings repeatedly; this property is especially important and time saving for the instructors who use graphics, do extensive calculations and write complex equations and formulas. Secondly, tablet PCs enable teachers to create more dynamic online lecture notes that students can easily search within. Teachers can use these lecture notes without breaking the conversation or facing another direction while teaching (Frolík & Zurn, 2004; Willis & Miertschin, 2004). Tablet PCs offer many advantages for college students such as mobility, interactivity, longer battery life than laptop computers, and easier input methods to write or highlight. They also allow display of digital books or new version Z-Books which enable students to interact with the content via sound files, video files, or interactive applications (Fischer, Smolnik, & Galletta, 2013).

The current students were born in a technology-rich era so computers, including tablet PCs, and the Internet were a part of their life all the time (Gu, Zhu, & Guo, 2013; Margaryan, Littlejohn, & Vojt, 2011). This generation is given different names, such as “Millennials”, “Net Generation”, and “Digital Natives” (Salajan, Schönwetter, & Cleghorn, 2010). Prensky (2001) made an exact distinction between generations based on the birth date and called the generation born after 1980 “Digital Natives”, whereas the generation born before 1980 are “Digital Immigrants”. These terms have been discussed by several researchers (Gu et al., 2013; Margaryan et al., 2011) but no consensus has emerged on them. While a group of researchers endorse Prensky (Gu et al., Zhu & Guo, 2013); another group opposes his idea (Margaryan et al., 2011; Salajan et al., 2010). Actually, the second group does not totally reject Prensky (2001); but they point out the insufficient empirical evidence regarding the generation differences. They mention that there is no concrete evidence to prove that the difference between digital natives and digital immigrants is much more than in the previous generations (Margaryan et al., 2011; Salajan et al., 2010). Even though there are two opposing groups discussing the terms both agree that a new generation has grown up under the influence of computers, mobile devices and the Internet (Gu et al., 2013; Margaryan et al., 2011). According to Guston (2006), this new generation not only requires technology in class, but also needs to be engaged with the topic. They have grown up in the hypertext era and do not like strict linear processes.

Several studies have been conducted to determine the technology usage levels of the new generation and affecting factors (Gu et al., 2013; Margaryan et al., 2011; Salajan et al., 2010). For instance, Margaryan et al. (2011) conducted a study on technology usage of university students. Their study showed that students’ technology usage may be influenced by technology use in university courses; and there was a complex relationship between age, subject, technology use and university support for technology usage in learning. Another study conducted by The Educause Center for Applied Research (ECAR) (2012) revealed that students adopted mobile devices, such as smartphones and tablet PCs, in higher education. According to results of the study, 67% of the students used mobile devices for academic activities and thought that these devices played an important role in their academic success. Gikas and Grant (2013) supposed that increased use of mobile technology between university students offered new options for students, and it encouraged educational institutions to explore the use of social media and mobility as an instructional strategy.

Since technology use is widespread in all aspects of people’s lives, professors, teachers or any kind of educators have been forced to redesign their courses to adopt new technologies. They have started to use new technologies and online materials such as videos and animations as a part of their courses. They produce their own materials if they are able to; or else they search for them online (White & Manton, 2011). Since they start to change their teaching habits and try to integrate ICT into their courses, their perception and use of technology in both their social life and classroom is critical. As Xu and Meyer (2007) claim, the decision to use technology in many higher education institutions is up to the faculty members so identifying how they perceive technology use and whether they sense the gap between them and their students shed light on their tendency to adopt ICT in their courses. Hence, the purpose of this research is to determine faculty members’ personal and educational use of technology especially iPads, their opinions on educational use of technology, and their students’ technology competency. The research questions of this study are:

- How do faculty members use the technology, especially iPads in both their personal and professional life?
- What do faculty members think regarding technology use in educational settings?

- What do faculty members think about their students' technology competency?

METHOD

In this study, qualitative research design was employed to understand faculty members' personal and educational use of technology especially iPads, their opinions on educational use of technology, and their students' technology competency. The qualitative research studies are interested in describing a situation in detail (Fraenkel, Wallen, & Hyun, 2012; Yin, 2011) and they represent the views and opinions of participants (Yin, 2011). Hence, qualitative research design was appropriate for this study due to its aims.

Case study research was utilized for this study as a qualitative research method. Case study is one of the qualitative approaches conducted to obtain in-depth understanding of a single case or multiple cases based on the determined variables, by using different data collection methods or tools such as observations, interviews, documents or questionnaires (Yin, 2009). Case studies are preferred when the research question consists of a "why" and "how" question, or the researcher has no or very limited control, or the research is about a temporary phenomenon (Yin, 2011). In this study we employed case study in order to understand how faculty members use technology for personal and educational purposes, how they define their and students' technology competency, and why.

Context of the Study

This study was conducted in a college of education in the Southwestern United States. The University started a five-year technology initiative in Summer 2012 that aimed at increasing student engagement and success via technology. The college of education was chosen as the pilot of the initiative for several reasons such as having fewer students than the other colleges, willingness to participate in the initiative, suitable curriculum and qualified faculty members who were already using technology in a similar manner to the initiative. As a part of the initiative, iPads were distributed to faculty members and students. Meetings were held for students and faculty members separately to introduce a variety of apps provided as part of the initiative and to explain the possible ways of using iPads in class.

Data Collection and Analysis

Data of the study were collected via semi-structured interviews. At the beginning of the study, we prepared a semi-structured interview protocol controlled by three faculty members from the College of Education. Based on experts' views, the final interview protocol was prepared that consisted of 33 questions under two sections. In the first section, 18 questions explored which technology devices faculty members own, how they use technology in and out of the school, and what they think about their technology competence. The second section included 15 questions to review faculty members' beliefs about students' technology competency, and differences between their current and former students. Each interview was recorded and lasted around 30 minutes. The interviews were transcribed, coded via the constant comparative technique, and analyzed based on the data analysis process of Miles and Huberman (1994). In other words, the researchers *filtered unrelated text from raw data, read transcripts to get meaning from interviews, extracted meaningful parts and creating first level codes, grouped related codes and created themes, and created a matrix based on codes and themes* (Miles & Huberman, 1994). Each transcription was independently analyzed by two researchers, each of whom had a Ph.D. in Instructional Technology, and experienced both in qualitative research and technology integration into education. Each researcher analyzed and coded the interview data, compared and sustained a consensus between the codes and themes.

Participants

A purposeful sampling method was employed in this study. Purposeful sampling can be defined as selecting participants based on their prior knowledge that can provide necessary data for the study (Fraenkel et al., 2012). The sample of the current study consisted of faculty members of the College of Education who participated in the technology initiative. For this study, out of 68 faculty members, eight faculty members -- from three different departments, Educational Psychology (EP), Instructional Leadership and Academic

Curriculum (ILAC), and Educational Leadership and Policy Studies (ELPS) -- participated. For this study, three full professors, four associate professors and one assistant professor volunteered to participate. While six of the participants were female, two of them were male. Furthermore, the experience of the participants ranged from 13 years to 46 years, while their age ranged from 39 to 67 years. The demographics of the participants are given in Table 1.

Table 1. Demographics of Participants

Participant	Age	Department	Program	Experience
P1	60	ILAC	Reading and Literacy	39 years
P2	63	EP	Special education	33 years
P3	67	ELPS	Educational Studies	46 years
P4	39	EP	Instructional Psychology and Technology	17 years
P5	45	ILAC	Reading and literacy	13 years
P6	57	EP	Instructional Psychology and Technology	25 years
P7	40	ILAC	Science Education	15 years
P8	44	ILAC	Mathematics Education	22 years

RESULTS

Technology Ownership and Personal Use

The data analysis showed that all participants owned a variety of devices, and they used these for personal and educational purposes. All the participants had at least either a desktop or a laptop computer, and an iPad. Furthermore, two of the participants described themselves as “tech geek” and stated that they followed the most recent technology advancements and owned the latest versions of the devices. More details about the technology ownership of each participant are given in Table 2.

Moreover, it was seen that in their daily life participants used technology for three main purposes in terms of *communication, getting or tracking information, and fun*. Regarding communication, the majority of participants mostly used e-mails, and three participants preferred Facetime as the primary communication mode. Similarly, participants used Skype and texting for communicating with both their colleagues and friends. All participants also used their devices either for getting or tracking different information such as tracking weather, their weight/exercise, news, shopping offers, and looking for cooking recipes. Lastly, participants used their devices for fun such as reading, watching video, listening to music, taking photos, recording videos, and playing games.

Table 2. Technology Ownership of Faculty Members

Participant	Technology Ownership
P1	iPAd, iPhone, MacBook Air, Dell Laptop, Desktop computer
P2	iPad, Smartphone (android), Desktop computer, Laptop (X2)
P3	iPad, Computers (X3), Cell Phone (not a smartphone)
P4	Every iPad 1 to 4 except iPad Air, Android Tablet, Smartphone (android), Google Chromebook, Mac laptop (X2), iMac (X2)
P5	iPad, iMac, MacBook Pro (X2), iPhone, Kindle
P6	iPad (X2), iPhone, iPod, Mac Computer (X2)
P7	iPad, Desktop computer, Laptop Computer, iPhone
P8	iPad, Smartphone (android), Laptop Computer, Desktop Computer

Technology and Apps Used in Class and Their Source

This study revealed that laptop computers and iPads were the main devices used in class. All participants mentioned that they used Laptop Computers and iPads as a part of their classes; only one participant mentioned that she used Smartboard in class. While Laptop Computers were generally used for preparing and presenting course materials such as presentations and videos, iPads were used for a variety of apps for many purposes. Although faculty members mentioned a total of 19 different apps, the most common were “Socrative” used by three faculty members, “Schoology”, “Notability”, and “iMovie” used by two faculty members.

When faculty members were asked about apps they used in their classes, it was revealed that they generally used non-educational apps, such as “Facetime”, “Kidblog”, “QR Code” for educational purposes. Furthermore, five faculty members especially mentioned that they employed non-educational apps as a part of their classes. For example, P1 used “Facetime” to connect students to class who were unable to attend. Furthermore, she used movie-making, photo-taking, and note-taking apps in order to create more effective course materials or games as a course material. P3 mentioned that he used iPads to deliver course materials to students before the class via e-mail so that students would bring the materials to the course, could reflect on the topic of the class and take notes directly on them during the class. Furthermore, P3 mentioned that he used D2L, the learning management system (LMS) of the university, over the iPads.

P4 used different apps related with the topic. For instance, she used a specific application to measure a classroom and different objects to show students how they could use mathematics in daily life. Moreover, she mentioned that she used apps to start or carry on class discussion which allowed students to share their experiences and opinions about apps. She initiated the discussion in two different ways; either by demonstrating the use of a particular app followed by asking about different ways of its possible usage, or asking them to share their experiences about different apps that they recommended to their friends. P5 stated that she used several apps such as quiz apps to evaluate the effectiveness of her lectures and student understanding of the lesson topics. Moreover, she stated that she took advantage of the technology to apply new teaching methods to her courses. For instance, she implemented the flipped classroom and used the technology to apply this method more effectively. She used an app to prepare course material for her flipped classroom and created her PowerPoint slides using her laptop; after taking the screenshots, she combined these pictures and added audio files in which she explained each picture. Finally, she sent them to students and asked them to watch the slides before class.

“So, I have used a lot of the apps, but I just treat them for my own purposes...When students come into class, I have music playing in the background... I feel like that’s something I do to prepare the class and get them ready.....I try flipped the classrooms this semester. So, I was recording... I recorded lectures before came to class and in the class we did hands on activities. They seem to enjoy it, but there is also some not so nice feedback, they were not too happy with the change” (P5).

P6 stated that she used technology, especially iPad, to create a classroom environment where all students share their ideas related with the lesson content.

“I’ve been doing group work for a long time. How do you have them do meaningful group work and share given the limited amount of time? And so, one of the things iPad is made a lot easier to have. This year none of the groups needed me to instruct them on Apple TV which really kind of shocked me. Last year, we all had to learn it, but this year even though they are new. But, they already figured out like that. It’s nice because they have to summarize their group work and then present it. And, that process has been a lot easier.” (P6)

P7 stated that she used Apple TV and many applications in class to increase the effectiveness of her lectures. For instance, she wanted her students to download several apps to their iPads, and she demonstrated their use to the class. Moreover, she took photos of her writings on the blackboard and sent those pictures to the absent students. Although she benefitted from the features of the technology in her lessons, she complained about the technical difficulties she faced and warned the instructors.

"We do spend unnecessary time just working with that technology either we can't get a connection to the Apple TV Network or it just takes a while. So we will have to either restart which takes a little while with the Apple TV. Ideally I would really like my students whenever they are doing projects that they can use the Apple TV device to project what they have been working on, but it's not efficient enough for me to waste class time to do that. I teach a grad class with five students six students and we actually...because the class is so small I can do that, but with a class of 21 it just it's not time efficient" (P7)

Lastly, P8 emphasized that she used educational apps in class such as *"digital microscope"* that a scientist might use in the field. She stated that she used several educational apps related especially for science and math.

This study also revealed that faculty members gained the information related with the apps via 6 different ways. Five faculty members were informed about the apps by their *friends and colleagues, students, and app store*. In addition to those, the *Internet* was mentioned by three faculty members, *technology initiative meetings* were mentioned by two faculty members, and *social media* mentioned by only one faculty member in this study.

Use of iPads

Since one of the purposes of this study was to investigate whether faculty members use iPads distributed as a part of the technology initiative, they were asked about how they used iPads and why. The interview data indicated that participants in this study used iPads both in their daily and professional life.

The results of the study revealed that faculty members used their iPads for a variety of personal reasons, but mostly for fun. The personal purposes could be listed as *social networks* (n = 2), *recording and watching video* (n = 2), *tracking personal data such as exercises and weight* (n = 2), *searching* (n = 2), *tracking weather* (n = 1), *arranging travels* (n = 1), *calculator* (n = 1), *reading* (n = 1), *taking photos* (n = 1), *communication* (n = 1), and *web-surfing* (n = 1).

Aside from personal use, faculty members benefited from iPad in their professional life. The six common ways of using iPads in professional life were *collaboration, class preparation, research, reading, grading and feedback*.

The most common purpose of using iPad among faculty members was collaboration. Six out of eight faculty members mentioned that they used iPads for collaborating with colleagues via *"skype", "hangouts", or "facetime"*. Furthermore, cloud-computing apps such as *"Google Documents", "Google Drive", and "Dropbox"* were used to collaborate and work simultaneously with colleagues.

"Yeah, I use it for Skype meetings and for Google+ Hangouts and stuff. ... Sometimes when I want to—like, I had to show somebody here how I wanted a website to look. What I did was I wrote it out and explained everything, and it made a video of how I wanted it to look, and then I emailed them the video" (P4)

"I have colleagues around the country and actually one in Australia... to Skype. So, I can type on my computer. So, it's good for an extra Skype thing. I use that all the time" (P6)

Secondly, faculty members used iPads for class preparation including reading students' papers and preparing course materials.

"I also use it a lot for reading student work. So, like before in my undergrad class we have these weekly writings. And so, I often, I always read them before class, so I can talk about them in class" (P6)

"If you send me a paper draft—actually, you sent me a paper draft and I did it on Word, which was rare. I usually put it on the iPad and then load it into Notability and then write on it so that it's like how I used to write on papers" (P4)

Moreover, one faculty member stated that she used iPad for her research. She mostly used her iPad in order to collect and analyze qualitative data, and read related articles on her research topic. Furthermore, another faculty member stated that even if she had not used her iPad for research, she was about to start new research projects and was planning to use iPad as a part of those projects.

"I use it for my coding. We use highlighters in Notability to code. I also use it for all of the articles that I read and for highlighting in the articles, and I also—like, for example, I was just doing interviews on a qualitative study. I took pictures of everybody's classroom using my iPad" (P4)

Two faculty members stated that they preferred to use iPad for reading over computers due to its mobility. Finally, while one participant stated that she used iPad for grading students' assignments, another used it to provide feedback to her students.

"Yes, I do it for student feedback a lot. I type my notes using my keyboard on my iPad in the Notes app, and then I am able to cut and paste it from my Notes app into the grade book. I also give all my student feedback" (P4)

Self-view on Technology Competency and Reasons for Technology Adoption

Technology competency and the reasons for technology adoption of faculty members were examined as a part of this study. Faculty members were asked to describe themselves whether they were "digital natives" or "digital immigrants" with reasons and examples. Out of eight faculty members, only one, P3, described himself as a "digital immigrant". Likewise, just one participant, P4, labeled herself as a digital native in some sense due to accessing technology and doing programming in her childhood.

"I am a digital native because I used a lot of technology as a kid, but it was not prevalent, so I would say in my generation, I would be considered pretty digital native. I did programming when I was a little kid. I would save up programs and take them to my cousin's computer, but I didn't have a computer myself until I was in high school... I think I was a digital native in that sense, but compared to what the students' experiences are today, I am not" (P4)

Furthermore, six of the participants considered themselves neither "digital natives", nor "digital immigrants", but something in the middle, maybe a "digital naturalized citizen". They stated that they had not grown up with the technology, which eliminated them from being digital natives. However, they added that they did not have any problem with the technology, and did not fear of it so they were not "digital immigrants" either.

"There needs to be a middle one. I mean, while 20 years ago, I would have said I was a digital immigrant, I think now I'm not a digital native, but I'm not a digital immigrant either... a digital naturalized citizen" (P5)

"I would probably say a combination. I feel like I use the, you know, the technology for personal, professional I mean every day I do but I know I can better. ...I just don't have the time or don't take the time to really learn those, but I do have a tutoring session upcoming with one of our IT people, he is going to sit down and kind of walk through some things. I would say a combination, but I am not fearful of it" (P7)

In addition to their self-view on technology competency, the participants were asked the reasons behind technology adoption in both their daily and professional life. It was seen that "needs" were the major reason for technology adaptation. Four participants indicated that they generally decided to spend money on technology based on their needs, and did not spend extra money for new devices they did not need.

Furthermore, while two out of eight faculty members mentioned that they adopted technology based on *personal choice*, and *advancements in technology*, only one faculty member stated that *technology integration into schools*, and *technology initiative of the university* were the major reasons for his adaptation.

"I do feel an obligation to make sure I learned as much as I could and got with my colleagues went to the professional development and tried to be a model for the students to the extent that I have accomplished that I don't know" (P8)

"I had actually started to integrate technologies into my classroom probably about 4 years ago, when I knew we had laptops for checkout, and I knew laptops were happening in schools, and I figured my students" (P1)

"The university spent a lot of money, or donated the money, whatever. I feel like they spent quite a bit of money to do that and I felt obligated to implement it" (P5)

On the other hand, *high cost*, and *the possibility of having bugs of new devices* negatively affected the technology adoption of faculty members. Two of the faculty members stated that when a new device was announced, it was so expensive that prevent them to buy. Furthermore, new devices might have hardware problems or software bugs that might not be predicted and needed to be improved.

"When the new one comes out, I buy one the right before it, because you get it cheaper" (P6)

"I will wait to see if there are any issues, any bugs or anything like that" (P7)

What Makes You a Digital Native?

According to results of this study, faculty member thought that the year a person born was not the only indicator of being a "digital native" or "digital immigrant". They mentioned that the factors affecting to be a "digital native" could be listed as *experience* (n = 6), *socioeconomic status* (n = 3), and *willingness to use technology* (n = 2). According to faculty members, a person could only be a "digital native" if he or she experienced the technology. This might be possible if socioeconomic status allowed people access to technology and they were willing to use it.

When the participants were asked to analyze their students, six out of eight faculty members mentioned that although most of their students were "digital natives", they still were struggling with the technology.

"Most of them... digital natives. They're digital natives in their everyday life. I don't know that they are digital natives in thinking about technology integration to be perfectly frank... They may be considered digital natives but not to the degree that I think next generation is going to be. Simply, because of sophistication of the technology itself." (P2)

"They believe that because they grew up with technology, they don't have a lot to learn" (P4)

"Most of them, yes... They may not have started out with that, but I do think that they have adapted really well. So I think they were probably exposed to in their not early childhood years but maybe elementary to junior high. So, they have been able to adapt very well" (P5)

"Although about the digital natives, they still struggle with how to use devices. And so, every new, it's not like they naturally figure out.... that does not mean they are completely competent. Even though they are digital natives, they still are learning. Of course they are, but they still have struggle in terms of making technology meaningful to them. That is a good thing" (P8)

The status of current students

The participants were also asked to compare their current and former students or generations. The findings indicated that participants in this study compared the generations under six main categories which were technology competency, in-class habits, language, technology use, learning styles and search habits.

Technology competency

The first and most mentioned difference between current and former students was the technology competency. Seven faculty members stated that their current students were technology competent, they were faster and better at learning a new application than the former ones.

"They think it's a lot higher than it is... they don't have any need to learn new things.. they think that because they grow up with technology, there is no point in learning about it or making themselves better" (P4)

"I think they are competent... They're certainly more able to use technology more quickly" (P1)

Only one faculty member disagreed with other participants and believed that current students still needed to know how to use technology and apps.

"They haven't general level of competence. But, certainly on new ones that they are still figuring out like things like how do you go from "Notability". How do you send something to Notability to me or even harder? They figured out quick. How do you get something from notability to D2L Dropbox? So, those kind of things they still trying to figure out. Figuring out a nice way to [send] you something, but then how do they get it to somebody else"

In class habits

The second commonly mentioned difference between two generations was in-class habits. Out of eight, six faculty members stated that in-class habits of the students had changed over time. The students were capable of multitasking, they liked sharing knowledge, and were more comfortable with the technology.

"I've noticed, is that there is way more comfortable with multitasking. They don't care anymore if I see they are doing "Pinterest" during class. I can't figure it out, they are confident while they are listening. They are not ashamed" (P6)

"When we are doing things that involve using iPad or technology they definitely seem to be engaged or excited about that or when we are doing the app reviews they were very interested in sharing those kinds of things with the class. Things that they have found and what it would do.... I have seen them a shift just overall in attitudes about learning" (P8)

Even though students were capable of multitasking as faculty members stated, it was mentioned that they did not use this ability always with good purposes. Five faculty members indicated that off-task behaviors of the students were different than the former due to advanced technology. Faculty members mostly complained that students used their mobile devices for non-educational purposes during the class; they especially used social media and chat apps during lecture time.

"If you're on Facebook, we're going to be having a meeting of the minds. And I have had to, I did have to last week, go stand behind someone for the third time and finally say, "Close that up," because she was not taking notes or looking at an uploaded piece... something I had uploaded to use for class. She was on Facebook" (P1)

"I am sure that they are not 100% engaged the whole time and I would imagine they probably check their e-mail once a while. I mean, because they are so social...it doesn't seem to gone to way of learning.... it has gone in the way of class discussion" (P2)

"They always were on their phone, and the only difference is their shoulders are not slumped over doing it. Now they are doing out in the open, and it's not a big deal. I used to get myself really upset over them doing these other things in class, but I now I have decided that I present a class and I am prepared for class, and if they choose not to participate, that is their choice, not mine" (P4)

Furthermore, some prevention was taken by the faculty members in order to stop or decrease the

off-task behaviors of the students. *Mentioning the rules on syllabus, arranging physical setting of the classroom, walking around, and warning them in-person* were some examples of the preventions.

"I try to physically set the classroom up so it is not all that easy for them to be checking their gadgets" (P3)

"I don't think no more than people texting on their phone you know I make it pretty clear that first day in class why we use it, when we use it, and don't be a distraction and they are pretty good about honoring that so I don't see it anymore then when texting was an issue when that first you know was pretty a problem" (P7)

"If it bothers me I address it... If the students [are] presenting and I am in the back of the room and I can see you know the stuff happening under the table and I have just been really tried to be really good about addressing it like look what could be happening in your life that you need to be texting? Is your mother dying? Is there something you know major going on? If not, put it up until break. I start the semester off with this is a text free zone you know we are not going to be texting in class and so on and if you have a problem with that just put your phone right up here if you can't keep from it. So I kind of make it light hearted about it, but I am serious about it you know I want them to be in class engaged because otherwise and this past semester I did have one student who continued to text frequently" (P8)

Technology use by students

Related with the differences between the generations, faculty members were asked to identify how their students use the technology. Five faculty members stated that their students were addicted to technology.

"If I looked back even 10 years ago, the students I have now are more tied to electronic devices and are certainly better at using them than I am, than students even 10 years ago.. most of them will either use the iPad or the laptop. I take laptops to class as well... and will look them up, and in many cases I will say, "Okay if you don't remember, get out your copy of your e-textbook or get online, and let's take a see what you find" (P1)

"When the iPads came in abundance into the classroom, I had a much harder time getting the students to have a class discussion... because. I don't think they are trying not to discuss... they are trying to put everything in their iPads. I do not think they are engaged in discussion as they used to be" (P2)

"I have been doing it has all; have all of these illogical fears about technology, thinking that technology is out to get them. Technology hates them. They are not good at it. They have really bad attitudes towards technology, and that hasn't changed. I think what's changed is that students now are more reliant on technology and they don't have other ways of doing things if the technology doesn't work. So if the technology fails, they freak out more" (P4)

Learning styles

When faculty members were asked whether there was a change in learning styles of the students, there was a disagreement between them. Three faculty members stated that the learning style of the students changed over time. According to them, current students were lazier, more passive, and less interactive than ever. On the other hand, three faculty members were against this idea, and stated that there was no difference between former and current students.

"They are more distracted. I think they are lazier, and I think they expect it to be given to them more, and they are more passive. They are waiting to receive, not as much as create" (P4)

"A lot of them prefer to just sit and get a lecture than actually do fun activities that make them think" (P6)

Search habits

Lastly, faculty members explained their ideas about the students' search habits. Three faculty members claimed that search habits of the students were changed over the time along with the technology.

"Well, their search habits are certainly different. I started teaching when people used the... they went to the library and looked through card catalogs... they access information differently than students did previously. I practically started teaching before there was television" (P3)

"If they don't understand a concept in class, they won't seek out the information on their own. They wait for me to explain it, or they ask questions where as if I am confused on something. I actively seek out various sources to figure out what I need to know. And so, I don't know if it is lack of motivation or lack of understanding how to use the technology or what can do for you" (P5)

DISCUSSION

Even though all the faculty members participating in this study could be considered as *"digital immigrants"*, the results of the study revealed that all the faculty members were aware of the advantages of the technology and use various technologies such as computers, tablet PCs, smartphones, and software easily in their daily life. Several researchers (Baker, Lusk & Neuhauser, 2012; Bayless, Clipson, & Wilson, 2013) state that students have started to use many technological devices such as smartphones, tablet PCs, laptop computers due to advancements in technology, and decrement in prices. Moreover, Teo (2015) emphasizes that with the diffusion of computers and Internet in our lives, young people use Internet for socialization, entertainment and education and use instant messaging and email to communicate with people. This study showed that this was also true for faculty members. They bought various devices and used them for different purpose in their daily life namely for communication, fun or to gain information about their interests.

The study of Alleman, Holly, and Costello (2013) revealed that in faculties, the technology usage for general and educational purpose was widespread but it was not extensive. According to Xu and Meyer (2007), funding of an organization does not affect the technology use of faculty significantly. Faculty decides to integrate the technology or not based on its perceived value. Before integrating specific technology to educational settings, they analyze whether it improves students learning and/or instruction, or decrease the job of instructors (Fredericksen, Pickett, Shea, Pelz, & Swan, 2000; Hartman, Dziuban, & Moskal, 2000). Technology use can be influenced by many factors such as faculty members' professional and demographic characteristics. It is assumed that younger faculty members are more open to using technological innovation and they get used to computers and Internet in their university education (Green, 2002). Controversially, faculty at higher ranks (associate, full professor) are claimed to develop their current ways of working in years so they might not be volunteering to change their working style. In this study, it is found that despite their ages and ranks, participants adapted new technologies both in their professional and daily life easily. It is seen that only two participants used them for preparation for their class. This might be caused by the experiences of the instructors. They might have prepared their course material in years so they did not need to prepare new ones. But, the majority of the participants used their laptops for projecting course materials such as PowerPoint slides, Internet search results, videos and used iPad for their class preparation such as overview their documents or reflection paper of their students as well as using some applications for educational purpose in their lectures. This might be also indicated the existence of course materials such as videos, and PowerPoint slides.

The participants in this study used iPad for both in their daily and professional life. This indicated that they integrated this technology into their work. They benefitted from this technology for various tasks. Participants used them especially for collaboration with their colleagues by using special chat applications such as Skype, Hangout and file sharing applications such as Dropbox. Moreover, they used them for preparing their lectures, their research, providing feedback and grading. This finding indicated that participants could integrate the new technologies into their professional life to meet their needs. Regarding technology adaptation of the participants, needs were the top reasons for technology adaptation whereas

high cost and possible bugs in the new version prevented some participants from buying newer versions of the specific technologies.

In some studies, it is reported that the faculty of education was the highest users of different instructional technologies (Guidry & BrckaLorenz, 2010; Perez-Stable, Sachs & Vander, 2013). According to Perez-Stable et al. (2013), this finding is not surprising since the faculty of education is generally considered to be the pioneer in pedagogical innovation. In this study, it is found that instructors not only used several instructional technologies, but also used several applications in their classroom in order to increase the effectiveness of their lectures. Waycott, Bennett, Kennedy, Dalgarno, and Gray (2010) analyzed 31 teaching and support staff regarding their technology usage. They found that technology usage in educational settings contributed student learning, and ease managing the learning activities. Dobbin, Dahlstrom, Arroway, and Sheehan (2011) mention that technology use helps the students to connect to the academic resources and related information, makes learning more applicable and creative and increases productivity, efficiency, and peer engagement. In this study, participants integrated the technology especially iPad in order to increase the effectiveness of their lessons. The apps used by the participants in this study are generally non-educational but they were adapted for their teaching activities. Herrington et al. (2010) advises that faculty members should not use only tablet PCs or iPod devices in their teaching activities. They should implement these technologies to increase their personal productivity, to test their pedagogical practice; benefit from their facilities such as taking pictures, recording videos and voices. It is seen that the participants in this study benefitted from the capabilities and features of the iPads and used them for different purpose. They created their course materials, analyzed their research data or integrated them as a course material in their lectures. In addition, participants informed about these applications generally from their students, colleagues and App store. This showed that they wanted to use apps both in their professional and daily life, sought applications and discussed with both their students and colleagues about the existing apps in order to find the appropriate apps that met their needs. This situation might indicate that participants took the applications seriously and integrated them if they met their needs in their lectures.

Prensky (2001) defined the generation born before 1980 as "*digital immigrants*" and the others "*digital natives*", but this study showed that most of the participants in this study disagreed with Prensky and proposed another term between these two which was suitable for their condition. But, they added that their students were digital natives and technology competent because they learnt how to use a new application faster than participants and the older generations. According to Bennett (2012), researchers have not agreed on the differences between the digital natives and immigrants in terms of technology use and self-efficacy. Romero, Guitert, Sangra, and Bullen (2013) found few differences between the students born before 1982 and in or after 1982 in their use and preferences of m-ICT. They also added that these differences were caused by the use of ICT rather than their age. In this study, the majority of the participants indicated that there was no big difference between them and their students. According to them, their students were generally technology addicted but they did not know the appropriate use of technology in the courses. This finding is consistent with previous studies. Teo (2015) states that, for young people, technology is necessary and they think that they are technologically skilled based on their use of personal technologies. However, Keengwe (2007) found that students did not appropriately use available technologies in the educational environment although they were proficient in using many technologies for communication. Hence, Keengwe (2007) claims that students need direct instruction about technology use in education and faculty should model the appropriate use of technology in order to help students to perceive technology use as valuable. The participants in this study also emphasized this fact and complained about their students' limited ability to use technology for educational purpose. They indicated that students could not use the technology in the educational setting appropriately. Thus, they explained the apps and demonstrated their usage in the class to the students in their lectures.

Finally, this study also found that the majority of the participants complained about the in-class behavior of their students and they needed to eliminate this problem in their lectures. Bayless et al. (2013) claim that students bring their technology into the classroom environment with increasing frequency. Although Denholm (2013) argues that instructors should allow students to use their smartphones and tablet PCs in class since they use them outside of class, many educators in the literature complain about the misuse

of laptops and tablet PCs in the classroom settings and state that they are a distraction rather than beneficial. Bugeja (2007) showed that students brought their laptops to take notes, but while the instructor tried to give the lecture at the front, they checked or sent e-mails, checked their Facebook accounts or played games through wireless connection. In their study, Tindell and Bohlander (2011) found that 92% of college students texted or receiving messages while waiting for the class to start, 95% brought their cell phones to the classroom and 30% sent or received messages during lecture time every day. Moreover, the researchers found that texting or receiving messages often related to the class size; in a class with 100 or more students, students texted more whereas in a small class size of 12 students, least texting occurred. Some 54% of the students in their study also indicated that their professors would be shocked if they learnt how much texting was occurring during their lecture. Moreover, another study conducted on 600 students revealed that 75% of the students spent more time on non-course activities if they brought their laptops to the classroom. Furthermore, 35% of the students spent more than 10 minutes on social network sites and e-mail per class (Sample, 2012). Hence, in some universities such as the American University, the College of William and Mary, Georgetown Law School, George Washington University, and the University of Virginia, professors forbid laptop use in their lectures (de Vise, 2010). Moreover, instructors in the University of Wisconsin, the University of Michigan, Florida International, and Harvard created laptop-free zones (Fischman, 2009). Bugeja (2007) reports that 20% of the syllabus in one school of Journalism includes warning about the misuse of technology in the learning environment and adds that the percentage will be increased in the future. Sample (2012) recommends forming a policy on personal technology use and informing the students about it. In this study, the participants also indicated misuse of technology occurred in their lessons; hence some of them needed to add warnings related to misuse of personal technologies in their courses.

REFERENCES

- Alleman, N. F., Holly, L. N., & Costello, C. A. (2013). Leveraging a new building to overcome first and second-order barriers to faculty technology integration. *Journal of Learning Spaces*, 2(1).
- Baker, W. M., Lusk, E. J., & Neuhauser, K. L. (2012). On the use of cell phones and other electronic devices in the classroom: Evidence from a survey of faculty and students. *Journal of Education for Business*, 87(5), 275-289.
- Bayless, M. L., Clipson, T. W., & Wilson, S. (2013). Faculty perceptions and policies of students' use of personal technology in the classroom. *Faculty Publications*. Paper 32.
- Bennett, S. (2012). Digital natives. In Z. Yan (Ed.), *Encyclopedia of cyber behavior: Vol. 1* (pp. 212-219). New York, NY: IGI Global.
- Biddix, J. P., Chung, C. J., & Park, H. W. (2015): Faculty use and perception of mobile information and communication technology (m-ICT) for teaching practices. *Innovations in Education and Teaching International*.
- Bojinova, E. D., & Oigara, J. N. (2011). Teaching and learning with Clickers: Are Clickers good for students? *Interdisciplinary Journal of E-Learning & Learning Objects*, 7, 169-184.
- Bugeja, M. J. (2007, January 26). Distractions in the wireless classroom. *The Chronicle of Higher Education*. Retrieved from <http://www.chronicle.com/article/Distractions-in-the-Wireless/46664/>
- Cope, C., & Ward, P. (2002). Integrating learning technology into classrooms: The importance of teachers' perceptions. *Educational Technology and Society*, 5(1), 67-74.

- Crooks, S. M., Yang, Y., & Duemer, L. S. (2002–2003). Faculty perceptions of web-based resources in higher education. *Journal of Educational Technology Systems*, 31(2), 102-113.
- Denholm, A. (2013, January 26). Smartphones and iPads must be allowed in class: Pupils will benefit from using their own devices, say report. *The Herald*. Retrieved from http://www.heraldscotland.com/news/13089631.Smartphones_and_iPads_must_be_allowed_in_class/
- de Vise, D. (2010, March 9). Wide web of diversions gets laptops evicted from lecture halls. *The Washington Post*. Retrieved from <https://emfjournal.wordpress.com/2010/03/10/wide-web-of-diversions-gets-laptops-evicted-from-lecture-hall/>
- Dobbin, G., Dahlstrom, E., Arroway, P., & Sheehan, M. C. (2011). Mobile IT in higher education (Research Report). Boulder, CO: Educause Center for Applied Research.
- Educause Center for Applied Research [ECAR] (2012). *ECAR study of undergraduate students and information technology*. Louisville, CO: Educause Center for Applied Research
- Fischer, N., Smolnik, S., & Galletta, D. F. (2013, February). Examining the potential for tablet use in a higher education context. In *Wirtschaftsinformatik* (p. 1). Retrieved from <http://www.wi2013.de/proceedings/WI2013%20-%20Track%201%20-%20Fischer.pdf>
- Fischman, J. (2009, March 16). Students stop surfing after being shown how in-class laptop use lowers test scores. *The Chronicle of Higher Education*.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8th ed.). New York: McGraw-Hill.
- Fredericksen, E., Pickett, A., Shea, P., Pelz, W., & Swan, K. (2000). Factors influencing faculty satisfaction with asynchronous teaching and learning in the SUNY Learning Network. *Journal of Asynchronous Learning Networks*, 4(3). Retrieved from http://www.sloan-c.org/publications/jaln/v4n3/v4n3_fredericksen.asp
- Frolik, J., & Zurn, J.B., (2004, June). *Evaluation of tablet pcs for engineering content development and instruction*. Paper presented at the ASEE (American Society for Engineering Education), Salt Lake City, Utah.
- Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *The Internet and Higher Education*, 19, 18-26.
- Green, K. C. (2002). Coming of age in academe. *Converge* magazine. Retrieved from <http://www.convergemag.com/magazine/story.phtml?id=29718>
- Gu, X., Zhu, Y. & Guo, X (2013). Meeting the “Digital Natives”: Understanding the acceptance of technology in classrooms. *Educational Technology & Society*, 16(1), 392-402.

- Guidry, Kevin R., & Allison Brcka Lorenz. (2010). A Comparison of Student and Faculty Academic Technology use Across Disciplines. *EDUCAUSE Quarterly*, 33(3), 1-12. Retrieved from <http://www.educause.edu/ero/article/comparison-studentandfaculty-academic-technology-use-across-disciplines>
- Halac, H. H., & Cabuk, A. (2013). Open courseware in design and planning education and utilization of distance education opportunity: Anadolu University experience. *Turkish Online Journal of Distance Education*, 14(1).
- Hartman, J., Dziuban, C., & Moskal, P. (2000). Faculty satisfaction in ALNs: A dependent or independent variable? *Journal of Asynchronous Networks*, 4(3). Retrieved from http://www.aln.org/publications/jaln/v4n3/pdf/v4n3_hartman.pdf
- Herrington, J., McKenzie, S., Pascoe, R., Woods-McConney, A., MacCallum, J., & Wright, P. (2010, May). A whole-school approach to technological literacy: Mobile learning and the iPhone. In Zoraini Wati Abas, Insung Jung & Joseph Luca (Eds.), *Global Learn Asia-Pacific 2010* (pp. 181-186). Penang, Malaysia: AACE.
- Hunsinger, M., Poirier, C. R., & Feldman, R. S. (2008). The roles of personality and class size in student attitudes toward individual response technology. *Computers in Human Behavior*, 24(6), 2792-2798. doi: 10.1016/j.chb.2008.04.003
- Kazley, A. S., Annan, D. L., Carson, N. E., Freeland, M., Hodge, A. B., Seif, G. A., & Zoller, J. S. (2013). Understanding the use of educational technology among faculty, staff, and students at a medical university. *TechTrends*, 57(2), 63-70.
- Keengwe, J. (2007). Faculty integration of technology into instruction and students' perceptions of computer technology to improve student learning. *Journal of Information Technology Education*, 6, 169-180.
- Kukulka-Hulme, A., & Shield, L. (2008). An overview of mobile assisted language. Learning: From content delivery to supported collaboration and interaction. *Re-CALL*, 20(3), 249-252.
- Kursun, E. (2011). *An investigation of incentives, barriers and values about the OER movement in Turkish universities: Implications for policy framework* (Unpublished doctoral dissertation, Middle East Technical University, Ankara, Turkey).
- Lewis, C. C., Fretwell, C. E., Ryan, J., & Parham, J. B. (2013). Faculty use of established and emerging technologies in higher education: A unified theory of acceptance and use of technology perspective. *International Journal of Higher Education*, 2(2), p. 22.
- Margaryan, A., Littlejohn, A., & Vojt, G. (2011). Are digital natives a myth or reality? University students' use of digital technologies. *Computers & Education*, 56, 429-440.
- Nihalani, P., & Mayrath, M. (2010). Statistics I: Findings from using an iPhone app in a higher education course. Retrieved from http://gylo.com/WhitePaper_03302010_Stats1.pdf
- Perez-Stable, M. A., Sachs, D. E., & Vander Meer, P. F. (2013). Inspiring results: Designing innovative instruction using faculty feedback on technology use and attitudes toward library research instruction. University Libraries Faculty & Staff Publications.

- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9(5), 1–6.
- Reiser, R. A. (2002). A history of instructional design and technology. In R. A. Reiser & J. A. Dempsey (Eds.), *Trends and issues in instructional design and technology*. Upper Saddle River, NJ: Merrill/Prentice Hall.
- Rodriguez, J. E. (2011). Social media use in higher education: Key areas to consider for educators. *Journal of Online Learning and Teaching*, 7(4).
- Romero, M., Guitert, M., Sangra, A., & Bullen, M. (2013). Do UOC students fit in the net generation profile? An approach to their habits in ICT use. *International Review of Research in Open and Distance Learning*, 14, 158–181.
- Rossing, J. P., Miller, W. M., Cecil, A. K., & Stamper, S. E. (2012). iLearning: The future of higher education? Student perceptions on learning with mobile tablets. *Journal of the Scholarship of Teaching and Learning*, 12(2), 1-26.
- Salajan, F. D., Schönwetter, D. J., & Cleghorn, B. M. (2010). Student and faculty inter-generational digital divide: Fact or fiction? *Computers & Education*, 55, 1393-1403.
- Sample, M. (2012, March 20). Best practices for laptops in the classroom. *The Chronicle of Higher Education*. Retrieved from <http://www.chronicle.com/blogs/profhacker/best-practices-for-laptops-in-the-classroom/39064>
- Tapscott, D. (1998). *Growing up digital: The rise of the Net Generation*. New York, NY: McGraw-Hill.
- Teo, T. (2015). Do digital natives differ by computer self-efficacy and experience? An empirical study. *Interactive Learning Environments*, 24(7). doi: 10.1080/10494820.2015.1041408
- Tindell, D. R., & Bohlander, R. W. (2011). The use and abuse of cell phones and text messaging in the classroom: A survey of college students. *College Teaching*, 60(1), 1-9.
- Xu, Y., Meyer, K. A. (2007). Factors explaining faculty technology use and productivity. *Internet and Higher Education*, 10, 41–52
- Waycott, J., Bennett, S., Kennedy, G. Dalgarno, B., & Gray, K. (2010) Digital divides? Student and staff perceptions of information and communication technologies. *Computers & Education*, 54, 1202–1211.
- White, D., & Manton, M. (2011). Open educational resources: The value of reuse in higher education. Retrieved from <http://www.jisc.ac.uk/media/documents/programmes/elearning/oer/OERTheValueOfReuseInHigherEducation.pdf>
- Willis, C., & Miertschin, S. (2004, October). *Tablet PCs as instructional tools or the pen is mightier than the board*. Paper presented at the SIGITE. Salt Lake City, UT, USA.
- Wise, J.C., Toto, R., & Lim, K.Y. (2006, October). *Introducing tablet PCs: Initial results from the classroom*. Paper presented at the ASEE/IEEE Frontiers in Education. San Diego, CA, USA.

Wood, W. B. (2004). Clickers: A teaching gimmick that works. *Developmental Cell*, 7(6), 796–797. [doi: 10.1016/j.devcel.2004.11.004](https://doi.org/10.1016/j.devcel.2004.11.004)

Yildirim, C., & Correia, A.-P. (2015) Exploring the dimensions of nomophobia: Development and validation of a self-reported questionnaire. *Computers in Human Behavior*, 49, 130–137.