

THE INTEGRATION OF PORTABLE TECHNOLOGY TO ENHANCE LIFELONG LEARNING SKILLS

Nick-Naser Manochehri Qatar University - Doha, Qatar nickm@qu.edu.qa
Nicolas Gromik EFE Program Qatar University +974 4403-5067
Swee Liang Aw Math and Computer Dept. Qatar University

ABSTRACT

The purpose of this research was to evaluate whether or not Arabic female students perceived some benefits of using iPods as a learning tool. The project was conducted over a six week period. Female student from the College of Business and Economic and the English Foundation program were provided with an iPod Nano to use anytime at their convenience as a learning tool. The task required that all student access iTunes to select audio-visual resources that they thought would be suitable to deepen their understanding of the course materials. Using case study research method the data collection approach included a weekly survey to record their daily use of the iPod. Four hypotheses targeting iPod use were defined. The findings indicate that for these particular groups of Arabic female students using iPod as a learning tool was beneficial. The evidence warrants further research in the constraints and affordances of mobile technology, as experienced by Arabic students.

Key words: iPod, Mobile Technology, System Acceptance, Information Technology, Gulf Cooperation Countries, Arab female student

INTRODUCTION

Since its appearance on the market in 2001, iPod technology attracted research interest on the integration of this technology in various learning environments from Australia, to Ireland, to the US and Taiwan. Scholars gathered data to assess the use of podcasting, audio and/or visual resources available on the web, as a learning tool in the classroom. Findings indicate that podcasting can be used for developing academic English (O'Bryan & Hegelheimer, 2007), to stimulate undergraduate students' independent learning in Japan (Gromik, 2008), to enhance students' appreciation of political philosophy (Woodcock & Duckworth, 2010), to provide learning material to dermatology departments in the US (Alkhan, Kaur & Feldman, 2010) as well as to deliver training videos to PhD students (Lawlor & Donnely, 2009) and to assist children with Autism (Cihak, Ayres & Smith, 2010). The literature has extensively reported on teachers recommending certain iTunes audio/visual resources for students to access either on their computers or mobile devices to deepen their understanding of a particular issue. The objective of this research is to document the use of both iPod and iTunes by female undergraduate students at a university in Qatar.

LITERATURE REVIEW

In educational environments, the iPod has been used as a tool to deliver supplementary course content, enabling students to view or listen to lectures on their mp3 players anywhere and

anytime at their convenience (Evans, 2008). Cebeci and Tedka (2006) provide explanations for creating appropriate learning resources for delivery on iPod devices. Lawlor and Donnelly (2010) contribute to the discussion by assessing the type of formats that postgraduate students prefer to develop their communication skills. Such evidence assist content producers to provide “accurate, objective content” (Alikhan, Kaur, & Feldman, 2010). Such teaching approach places the iPod and iTunes as prescriptive services whereby the teacher creates and prescribes a particular dose of learning materials to enhance students’ knowledge of a particular content.

Research questions have investigated iPod affordances as a tool for enhancing revision (Evans, 2008), to deepen participants’ “knowledge and/or skills” (Ragusa, Chan & Crampton, 2009), and to confirm that iPod/iTunes based learning leads to better student performance and content comprehension (McKinney, Dyck, & Luber, 2009). Research on language learning and mp3 technology has employed similar strategies to disseminate complementary learning materials to learners (O’Byran and Hegelheimer, 2007). Gromik (2008) has argued that students could actually be entrusted to self-select their English learning materials from iTunes. This is a shift away from the complementary prescriptive approach.

The purpose of mp3 technology and mobile learning is to eventually empower subscribers to become efficient viewers of content related to their educational field or interests. Few articles have reported on students’ independent selection of content for autonomous learning.

Therefore this research project was designed to investigate Arabic female use of iPod as a tool to learn independently. Two groups of female university participants were selected.

RESEARCH PROPOSITIONS

Prior students’ needs analysis revealed that Arabic female students were familiar with mobile technology (Gromik, 2010), but little was known about their use of such technology. The objective of this research was to understand and observe students’ use of iPod Nano devices to study independently. Evans (2008) evaluated the benefits of iPod technology in terms of the time students spent studying with the device, the affordances of learning with such tool, the amount of time learners spent to understand a particular material and student-teacher relationship due to podcasting. Evans’ comments guided the four hypotheses considered for this research, which are as follows:

P1: There is a difference of ease of use of iPod/iTune technology between Foundation Program (FP) and College of Business and Economics (CBE) students

P2: There is a difference between use of iPod/iTune technology outside classroom between FP and CBE students

P3: There is a difference in selecting iPod/iTune learning content between FP and CBE students

P4: There is a difference in use of iPod/iTunes for improving independent learning skills between FP and CBE students

The literature on iPod use in the classroom has seldom investigated whether or not participants with academic experiences behave differently in relation to familiarity and ability to use the technology than their peers with no prior academic experiences. The literature asserts that iPods are user-friendly, however little is known about Arabic female interaction with iPods. Proposition 1 addresses this issue to ascertain whether or not the technology is user-friendly and if this plays some influence on learning.

Reports on mobile learning have suggested that participants do take the time to study outside the classroom. However, Shudong & Higgins (2005) have argued that society is filled with distracters and limitations that affect student and technology performance. Proposition 2 aims to ascertain whether or not students with different academic background and experiences will use technology in a similar fashion outside of class time.

Investigators have for the most part provided all the necessary learning material to iPod users. In contrast, Gromik (2008) has suggested that undergraduate and postgraduates students are mature enough to be entrusted with searching for podcasts that would suit their learning needs. The third proposition considers whether or not students are able to search and select material relevant for their studies.

Students are happy using technology, but seldom are personal experiences reported. The last proposition investigates if using iPods/iTunes engages students to consider the learning strategies they utilize. In the case of Taiwanese students, Ho and Cho (2009) found that their participants did not recognize any learning benefits of using podcasts. In contrast, Abdous et al. (2009) reported that learning with podcasts had a positive effect on his participants' study habits. Walls et al. (2010) report similar findings indicating that podcast did contribute a bit to learning outcome. However both Abdous et al. and Walls et al.'s research did not investigate the study habits as micro skills. For example could using iTunes resources and/or an mp3 player improve note taking skills? McKinney et al. (2009) suggested that there was a correlation between viewing podcast content and taking notes. The aim of proposition four is to investigate whether or not the use of iTunes/iPods is conducive to improve students' learning skills.

DATA COLLECTION & RESEARCH METHOD

First, in order to test the survey items, a pilot study was conducted with ten students. These respondents felt that survey was a little difficult to complete. Based on this feedback, changes were made to the layout of the questionnaire, with a view to improve readability, to reduce the amount of time to answer the survey and to increase the reliability of respondents.

Thereafter, two groups of female participants at a large university in the Gulf region were selected. The first group was 10 Foundation Program (FP) female students enrolled in the English Foundation. The second group was comprised of 50 female undergraduate students enrolled in College of Business and Economics (CBE) principals of Management Information Systems (MIS).

Participants were informed that the survey was anonymous, participation was entirely voluntary, and response would be secured as per university confidentiality policy. Without much encouragement, participants are less likely to return all surveys (Burns, 2000). Therefore data for this study was gathered by a weekly paper-based survey collected in class, thus increasing the return rate. Sixty surveys were distributed weekly, and the return rate was 90%. However, since some respondents missed significant parts of the survey (i.e., perception and/or demographic questions) they were taken out of the study. The total valid sample for analysis was 53 (FP=9, CBE = 44).

The students were provided with an iPod Nano each, a weekly survey, as well as with a list of iTunes audio-visual resources relevant for the course topics. Students were informed that the purpose of the research was to understand their use of the iPod and that they had to regularly complete and return the weekly survey.

Students were informed to use their iPod to view or listen to iTunes content anytime anywhere as often as possible at their convenience and to fill in the survey to report their use and opinion of such learning approach.

The survey used contains of few sections: Demographic information: including questions on educational level, nationality, and whether participants have or used iPod/iTunes. Perception questions: A section on Five-point Likert-scale questions pertaining to attitude, intention to use, iPod and iTunes weekly use, content of audio/video listened/watched in iPod/iTunes.

It should be pointed out that while some of the participants may not be familiar with iPod features owing to lack of iPod experience, other respondents may have prior exposure to iPod. To handle this difference, at the beginning of the course both groups were provided with one training session to demonstrate the process for downloading iTunes, searching for content, and synchronizing the new content to the iPod. All students were provided with the same guidelines and assistance, however; technology support was provided to students experiencing extreme difficulties.

DATA ANALYSIS

The responses revealed that while 77% of the participants were Qatari nationals, 23% were non-Qatari. A small percentage of participants (22%) had used iPod previously. This may affect students' experience and responses on the survey, but these researchers did not think that it would jeopardize the reliability of the findings. Once the students started using the iPods, it became apparent that while 17% reported using only iTunes to access learning materials, 83% of the participants used their iPods to view these resources. In addition, while 77% of the participants used the iPods provided by the researchers, 23% indicated that they would prefer to use their own iPod mp3 players. They explained that they wanted to learn more about the capabilities of their mp3 player.

Reliability Analysis

Once all surveys were collected, The SPSS software was used to calculate descriptive statistics, reliability coefficient and t-test. Internal consistency for each of the four propositions was measured in the questionnaire with the reliability analysis using Cronbach's alpha coefficients (Hill and Lewicki, 2006). Reliability is a measure of consistency and gives the properties of measurement scales and the items that make them up. It provides information about the relationship between individual items in the scale, and tests the extent to which a set of questionnaire items accurately measures the same variables. The Cronbach Alpha for ease of use questions was 0.728 (6 items), for outside classroom use was 0.927 (10 items), for choosing content was 0.681 (4 items) and for independent learning skills was 0.76 (6 items) which are all above value acceptable 0.65 (Armstrong & Laschinger, 2006; Lake, 2002; Laschinger & Leiter, 2006).

RESULTS

In the findings of the proposition results, an independent-samples t-test was conducted to compare the related group of questions which related to each proposition. Independents-samples t-test was chosen to assess whether the means are statistically different between two groups. This analysis is appropriate whenever you want to compare the means of two groups, and especially appropriate as the analysis for the post test for only two group experimental design. The statistics t-test allows to answers questions by using the t-test statistic to determine a p-value that indicates how likely we could have gotten these results by chance. By convention, if the p-value is a less

than 5% chance of getting the observed differences by chance, we reject the null hypothesis and say we found a statistically significant difference between the two groups. The results for each proposition are presented separately below.

Proposition 1 investigates if there is a difference of ease of use (EOU) of iPod/iTune technology between Foundation Program (FP) and College of Business and Economics (CBE) students. As shown in table 1, there was not a significant positive association in EOU of iPod/iTune between the Foundation Program (FP) Female Student and College of Business (CBE) female students.

Table 1. Mean, Std. Dev, t-test, significant of EOU variables

Satisfaction Method	CBE (n1=44)		FP (n2=9)		t	Sig (2-tails)	Status
	Mean	Std. Dev.	Mean	Std. Dev.			
Have problem with iTunes	1.886	.321	1.666	.500	1.691	.236	Retained
Have problem with iPod	1.892	.2893	1.850	.000	0.433	.667	Retained
Time spent on using iTunes	1.250	.438	1.111	.333	0.897	.374	Retained
Time spent on using iPod	1.512	.476	1.510	.000	0.016	.972	Retained
I give up if I couldn't find anything	1.840	.369	1.888	.333	-0.36	.706	Retained
I take rest and try again if I couldn't find anything	1.636	.486	1.888	.333	-1.48	.076	Retained

The t-test did not reveal a statistically reliable difference between the mean number of EOU that the CBE student has ($M = 1.88$, Std. dev = 0.32) and that the FP student has ($M = 1.66$, Std. dev. = 0.50), $t = 1.691$, $p = 0.097$, $\alpha = 0.05$. This indicates that students from both groups did not experience problems with using iPod/iTune and they were more likely to use iTune/iPod. In addition, it implies that if students from both groups do find problem with iTune/iPod, they are not going to give up, instead they are most likely to take the risk of solving the issue. Therefore; there was not a significant association between two groups in EOU and we do retain the null hypothesis.

The second proposition explores the difference between use of iPod/iTune technology outside classroom between FP and CBE students. The t-test analysis indicated no statistically significant difference of iPod/iTunes technology use outside the classroom between the FP Female Student and CBE Female students except for using this technology when they are at home where FP Female Student ($M=1.22$, $SD=0.44$) and CBE Student ($M=1.63$, $SD=0.48$) ; $t=2.36$, $p = 0.022$.

Table 2: Mean, Std. Dev, t-test, significant of outside classroom use variables

Satisfaction Method	CBE (n1=44)		FP (n2=9)		t	Sig (2-tails)	Status
	Mean	Std. Dev.	Mean	Std. Dev.			
I use iPod when I am at	1.6364	.48661	1.2222	.44096	2.36	.022	Rejected

home (woke up/go to bed/relaxed)								
I use iPod when I am having meal (lunch/dinner)	1.9773	.15076	1.8889	.33333	1.263	.212		Retained
I use iPod when I was on the way to university/home	1.7500	.43802	1.7778	.44096	-.173	.863		Retained
I use iPod when I walked around in campus	1.8409	.36999	1.8889	.33333	-.360	.720		Retained
I use iPod when I waited for others	1.7955	.40803	1.8889	.33333	-.643	.523		Retained
I use iTunes when I am at Home (Woke up/relaxed at home/went to bed)	1.5000	.50578	1.5556	.52705	-.298	.767		Retained
I use iTunes when I am having meal (lunch/dinner)	1.9545	.21071	1.8889	.33333	.766	.447		Retained
I use iTunes when I was on the way to university/home	1.8409	.36999	1.7778	.44096	.452	.653		Retained
I use iTunes when I walked around in campus	1.8864	.32104	1.8889	.33333	-.021	.983		Retained
I use iTunes when I waited for others	1.7955	.40803	1.8889	.33333	-.643	.523		Retained

Therefore, there is no significant difference in iPod/iTunes use outside classroom between FP and CBE female students and the null hypothesis is retained for all items except the first item “I use iPod when I am at home (woke up/go to bed/relaxed). Proposition three considers that there is a difference in selecting iPod/iTunes learning content between FP and CBE students.

Table 3: Mean, Std. Dev, t-test, significant of learning content variables

Satisfaction Method	CBE (n1=44)		FP (n2=9)		t	Sig (2-tails)	Status
	Mean	Std. Dev.	Mean	Std. Dev.			
I choose Arabic audio/video because I feel better	1.772	.423	2.000	.000	-1.556	.001	Rejected
I choose Arabic audio/video because it is easier	1.646	.321	1.888	.333	-.021	.983	Retained
I choose English	1.340	.479	1.111	.333	1.367	.178	Retained
Use iTunes/iPod for entertainment	1.393	.428	1.333	.500	.370	.713	Retained

The results on Table 3, indicate that there is no statistically significant difference for choosing the contents when using iPod/iTunes between both groups, except for “I choose Arabic audio/video because I feel better” where Foundation Program Female Student (M=2, SD=0.00) and CBE Student (M=1.77, SD=0.42); $t(51) = 3.55$, $p = 0.01$. Therefore, the null hypothesis is retained.

The last proposition examines any difference in use of iPod/iTunes for improving independent learning skills between FP and CBE students.

The t-Test analysis indicated no statistically significant difference of the reasons for not using iPod/iTunes technology between pre and post female CBE Student except for Improving in note taking strategies where FP Female Student (M=4.13, SD=0.60) and CBE Student (M=3.52, SD=0.75) ; $t=2.25$, $p = 0.029$ and Improving learning time management where FP Female Student (M=4.00, SD=0.87) and CBE Student (M=3.38, SD=.83) ; $t =2.01$, $p = 0.049$.

Table 4: Mean, Std. Dev, t-test, significant of independent learning variables

Satisfaction Method	CBE (n1=44)		FP (n2=9)		t	Sig (2-tails)	Status
	Mean	Std. Dev.	Mean	Std. Dev.			
Watch video using iPod improve knowledge on subject	3.93	.728	4.44	.732	-1.904	.082	Retained
Listen audio on iPod improve knowledge on subject	3.95	.746	4.13	.599	-.658	.460	Retained
Improve note taking strategies	3.52	.754	4.13	.599	-2.247	.029	Rejected
Improve learning time management	3.38	.834	4.00	.866	-2.01	.049	Rejected
Clips for learning keep best interest in mind	3.86	.966	4.11	.782	-.728	.417	Retained
Easy to do task that wanted to do	4.07	.789	4.00	1.000	.193	.822	Retained

There is a difference between pre and post female CBE Student of the reasons for not using iPod/iTunes technology in term of improving note taking strategies and improve learning time management.

DISCUSSION

Very little evidence concerning technology use by Arab female students is available; therefore the purpose of this case study was to investigate their ability to study independently with iTunes services and/or iPod technology.

Previous research has indicated that there was a lack of quality content available from iTunes (Thomas, 2006) and teachers were most likely to create their own learning materials. In addition Thomas (2006) reported that most students did not have enough basic technical skills to work with digital environments. Abdous, Camarena and Facer's (2009) research also reported that some students did not feel proficient with using podcast technology.

While case study results cannot be generalized (Yin, 2003), the findings in this case study did not report any barriers that would prevent these female participants from accessing iTunes to download resources to view on their iPod. Students in this case study had the time and inclination to use their iPods to study anytime anywhere. If students had any challenges with using iTunes or iPod, they were most likely able to resolve this problem on their own. By the end of the term students commented that they had become familiar with iTunes and their iPod, thus

highlighting the user-friendliness of this online service and mp3 player for this particular group of female students.

Results for proposition 2 indicated that students used their iPods outside of class in a similar fashion. They mostly used it during travel time to and from university. According to the findings students seemed to behave differently once they were at their place of residence. It would seem that students were more likely to use iTunes rather than to continue to make the most of the mobility that their iPods affords them. This seems to concur with Gromik's (2008) findings which indicated that Japanese students were able to decide where and when to use their iPods. Indeed some students recognized the benefits that mp3 technology affords them and they were willing to capitalize on the mobility factor (Evans, 2008).

Female Arabic students from the CBE department felt more at ease with listening to Arabic podcasts compared to the female of the foundation program. This is most probably due to the fact that the purpose of the foundation program is to enhance students' English abilities; a prerequisite for entering and participating in university courses. Also both groups commented that it was easier to search for podcasts in their native language. Both groups also indicated that they used iTunes and iPods entertainment for non-academic purposes.

Proposition four concurs with findings from Walls et al. (2010) that students perceived some benefits of using iTunes/iPods to enhance their learning. However, while students utilized iTunes and their iPods to improve their interest and knowledge of the subject, they differed in their perception that iTunes and iPods improved their note taking skills and improved their learning time management.

It would seem that students perceived some benefits with studying with iTunes and iPods. However depending on their academic background students with less academic preparation needed more time to develop the necessary skills to use the technology independently.

The opportunity to use different devices to access podcasts means that students do not need to use iPods in order to access iTunes (Walls, et al. 2010). As the old adage states "you can lead a horse to water, but you can't make it drink". It is true that teachers can demonstrate and explain the advantages of learning on the move anytime anywhere, but there are limited strategies for researchers to ensure that students use the technology outside of class. This affects how students interact with the technology and consequently the feedback they provide.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Sample size is a contentious issue amongst researchers, as it may affect analysis and interpretation (Hinkle et al., 1998, Pallant, 2007). While the sample size of 9 students from the Foundation Program and 44 from the BCE group may be small, the sample focus group contributes towards understanding a group of participants that has up to now received little attention from the research community. The objective of this research was never to offer generalizations, but to begin a conversation about Arab female use of mobile technology.

Another controversial limitation is the possibility that a Hawthorn Effect may have occurred in this research (Burns, 2000). The research investigates the use of iTunes and iPods by Arabic female students and these participants may have modified their behavior to demonstrate that they did use the technology. This may not reflect their normal daily study activities during which these learning tools may not have had an influential role.

Since this is one of the few researches that investigate technology use by Arab females' students, the research focus addressed only a few propositions. Nonetheless, the preliminary findings have

established areas for further research. For example some researchers have commented on perpetual connectivity and its effect on students' isolation and establishment of more introverted social networks.

CONCLUSION

iPod is a powerful multimedia device which is increasingly being reported as a useful study tool for students anytime and anywhere they want. iTunes is a reliable online source of audio-visual resources, and the iTunes University section with its many free and professional learning materials holds promise for the development of online and distance learning. As students learn to access and utilize these resources to construct and deepen their own knowledge base, they will be able to develop lifelong learning skills and carry these with them to their future career path. Results indicated that iTunes and iPods have the potential to encourage learners with and without prior academic experience to capitalize on mobile learning and to engage them to select learning materials of interest and relevance to their learning needs. The results revealed that Arabic female students are using mobile technology to extend their academic knowledge and it would appear that they had sufficient English language cognizance to view content produced in the target language. This study also suggested that there was not a significant difference in performance between CBE students and student from foundation program; meaning that iTunes and iPods are user-friendly and can accommodate for any academic level. Research with iTunes and mp3 can now shift away from prescriptive teaching methods towards more individualized learning approaches.

REFERENCES

Abdous, M., Camarena, M. M., Facer, B. R. (2009). MALL technology: Use of academic podcasting in the foreign language classroom. *ReCALL*, Vol. 21, No. 1, pp. 76 – 95.

Alikhan A, Kaur RR, Feldman SR. (2010) Podcasting in dermatology education. *J Dermatolog Treat* 2010; 21:73–9.

Anderson, N., Lankshear, C., Courtney, L. & Timms, C. (2008). Because it's boring, irrelevant and I don't like computers: Why female secondary school students avoid professionally-oriented ICT subjects. *Computers & Education*, 50, p.1304-1318.

Armstrong, K., & Laschinger, H.K.S. (2006). Structural empowerment, Magnet hospital characteristics and patient safety culture: Making the link. *Journal of Nursing Care Quality*, 21(2), 124–132.

Cihak, D., Ayres, K.M., & Smith, C. (2010). The use of video modeling via a video iPod and a system of least prompts to improve transitional behaviors for students with Autism Spectrum Disorders in the general education classroom. *Journal of Positive Behavior Interventions*, 12(2). 103-115.

References are available upon request from Nick-Naser Manochehri.