Tablet Computer Literacy Levels of the Physical Education and Sports Department Students

Gülten HERGÜNER [1]

[1] Sakarya University Faculty of Sports Sciences herguner@sakarya.edu.tr

ABSTRACT

Education systems are being affected in parallel by newly emerging hardware and new developments occurring in technology daily. Tablet usage especially is becoming ubiquitous in the teaching-learning processes in recent years. Therefore, using the tablets effectively, managing them and having a high level of tablet literacy play an important role within the education system. This study aimed at determining the tablet literacy levels of students in the Physical Education and Sports Teaching department at Sakarya University in Turkey, and examining this data with regard to various variables. Some 276 students participated in the study. Findings of the study suggest that the sample has a high tablet literacy level. While no significant difference was found in the tablet literacy by gender, the students in the 2nd grade are noted to have higher levels of tablet literacy compared to the students in 3rd and 4th grades and tablet owners are more tablet literate when compared to non-owners. A significant but low level correlation was found between the tablet usage time and tablet literacy.

Keywords: *tablet computer, tablet computer literacy, sport education, teacher candidates.*

INTRODUCTION

The rapid development of information and communications technology affects education processes and the countries following this process closely are adapting their education systems accordingly. It is undeniable that technology use by students and teachers will facilitate the education process. Therefore integrating correctly configured technology into the education process is increasingly important.

Many countries and particularly developed countries, are systematically integrating technology into their education systems. Technology is being integrated into education programs in Turkey with the FATiH Project (Movement of Enhancing the Opportunities in Education and Improving the Technology).

The FATİH Project in education is designed to allow effective use of information technology tools in the classrooms with the aim of ensuring equal opportunities in education and improving technology in schools. The aim is to provide 570,000 classrooms in all levels of pre, primary and middle schools with interactive white boards with LCD panel and internet infrastructure. Under this project, every student and teacher is provided with a tablet computer. To ensure effective use of the IT hardware installed in the classrooms, teachers will undergo in-service training. In this process, the education programs are being rendered suitable for the IT assisted education and educational e-content is being created. Within this scope, the FATiH project consists of five main components, namely:

- Providing the Hardware and Software Substructure
- Providing and Managing the Educational e-Content.
- Effective IT use in Education Programs
- In-Service Training of the Teachers
- Ensuring the Conscious, Secure, Manageable and Measurable IT usage (MEB, 2016)

One of the technological hardware distributed with the FATiH Project is the tablet computer. Tablet computers can be described as portable devices having a small touch screen, internet access, and data storage capability. These features make tablet computers one of the most used devices in recent years. Having Internet access, the ability to play sounds, send e-mails, watch and record videos and read e-books are some features contributing to the increasing popularity of tablets (Shurtz, Halling, &Mckay, 2011).

Although tablet computers are similar to other computers, their advantages include functionality, ease of use, interaction and touch screen friendly applications; they also have disadvantages in terms of the ability to use the productivity tools (Mock, 2004). However, tablet computer benefits are visible in many studies in terms of improving students' problem solving abilities (Gök, 2012); student performance (Enriques, 2010; Pryor & Bauer, 2008) and enhancing students' problem solving abilities (Ellington, Wilson,& Nugent, 2011).Other studies show that tablet computers increase interaction (Koile& Singer, 2006) and communication (Galligan, Hobohm,& Loch, 2012; Jones & Sinclair, 2011; Sneller, 2007).

The literacy term however, in its most basic sense, can be described as the individual ability to sustain life within the society they live in, being able to read to a certain extent that is enough for them to communicate with society, while also being able to write and solve basic arithmetic operations (Karunaratne, 2000). Willem et al. (2006) state that the literacy term is not a basic notion that has only one accepted description; nor is there a universal definition or a standard for the notion. Ginsburg and Creger (2003) state that the new notion of literacy consists of the ability to live in the 21st century; it does not only represent reading, writing and solving basic mathematical operations but also includes the ability to manage the types of information appearing in different shapes and forms throughout daily life. Blackall (2005), on the other hand, states that 21st century literacy can be described as the overlap of verbal, visual and numerical literacy, skills and talents. Therefore, technological literacy is necessary as part of the 21st century literacies emerging for the teachers who are key players in the education system.

Holland (2004) emphasizes that students need to be raised as individuals who are able to adopt technological innovations, able to describe and solve problems, while also having the potential to affect their lives and future, and make appropriate decisions. Individuals who can make conscious decisions about technology can be described as technology literate. Technology literacy can be described as having the appropriate skills, information and behavior for using, applying, designing and changing the technology (Wang, 2003). Therefore, our teachers who possess the competences of 21st century teachers, especially nowadays when the FATiH Project is topical, are expected to be able to use the tablet computers that are one of the main components of the FATiH Project, actively and effectively. This is only feasible if teachers are tablet computer literate.

Tablet computer literacy, while being one of the new literacy notions, can be described as being aware of the tablet computer features and having the skills to use the tablet computers at normal and advanced levels. This study is aimed at determining the tablet literacy levels of the students of the Physical Education and Sports Teaching department, who are the teachers of the future, and examining this data in terms of various variables.

METHOD

The purpose of this section is to provide information regarding the findings, participants, data collection tool and data collection process of the study.

Participants

Some 276 students of the University of Sakarya, Faculty of Sports Sciences, Physical Education and Sports Teaching Department participated in this study, which aimed at measuring the tablet computer literacy levels of the Physical Education and Sports Teaching students. Participant selection for the study was conducted through convenience sampling. Some 117 (42%) of the participants are female and 159 (58%) are male students. Their age group is 18-34 years. The majority of the students are 21 years old. In addition, 64 (23%) of the participants are students in the 1st grade, while 66 (24%) are in 2nd grade, 62 (22%) in 3rd grade and 84 (31%) in 4th grade.A total of 123 students (45%) own a tablet computer while 153 (55%) do not own one. The time of usage of the students owning tablets varies between 1 and 13 years. The highest frequency of usage is 3 years.

Data Collection Tool

The data collection tool used in the framework of this study is the "Teacher Candidates Tablet Computer Usage and Literacy Scale" developed by Kıyıcı, Kırksekiz, Kiper, and İşbulan (2014). The scale features 33 items and is in the 3-factor structure.

There are 15 items in the first factor. The load values of these items vary between 0.56 - 0.88. This factor which accounts for the 29.82% of the total variance of the scale, is named as "Tablet Computer Basic Level Usage Competence". There are a total of 9 items in the second factor of the scale (with load values varying between 0.62 - 0.74). This factor accountingfor 15.60% of the total variance of the scale, is named the "Tablet Computer Feature Awareness". The third factor of the scale involves 9 items. The load values of these items vary between 0.74 - 0.46. This factor which accounts for 14.84% of the total variance of the scale is named the"Tablet Computer Advanced (Expert) Level Usage Competence".

Internal consistency coefficients are found as the following: .96 for the "Tablet Computer Basic Level Usage Competence" factor, .88 for the "Tablet Computer Feature Awareness" factor and .89 for the "Tablet Computer Advanced (Expert) Level Usage Competence" factor. These internal consistency coefficient values are considered to be acceptable values for the reliability level of the tablet computer literacy competence scale. Hence the overall "Teacher Candidates Tablet Computer Usage and Literacy Scale" can be used in the study.

Data Collection Process

In this study aimedat measuring the tablet computer literacy levels of students in the Physical Education and Sports Teaching Department and examine this data in terms of various variables, the data werecollected by applying the Tablet Computer Usage and Literacy Scale on the 276 students in the University of Sakarya, Sports Sciences Faculty, Physical Education and Sports Teaching Department in the Fall Term of the 2015-2016 Academic Year. The data collection process took approximately 2 weeks and special attention was paid in order to ensure the data collection to be from the volunteer students.

FINDINGS

In this section, the findings regarding the study are given in terms of the tablet computer literacy level, gender, age, grade, tablet computer ownership and the period of owning a tablet computer.

Table 1. The Tablet Computer Literacy Levels of the Students

	$\bar{X}$	Max	*SD*	%
Tablet Computer Usage Competences	64.41	75	13.26	%86
Tablet Computer Feature Awareness	35.73	45	7.63	%79
Tablet Computer Advanced Level Usage Competences	36.91	45	8.05	%82
Tablet Computer Literacy	137.06	165	26.77	%83

According to the findings, the students' total scores for "Tablet Computer Usage Competences", "Tablet Computer Feature Awareness", "Tablet Computer Advanced Level Usage Competences" and "Tablet Literacy" are at high levels. According to these findings, it can be said that the tablet literacy skill of the Physical Education and Sports Teaching Department students is at high level.

Table 2. The Tablet Computer Literacy Levels of the Students in terms of the Gender Variable

	Gender	N	$\bar{X}$	*SD*	*T*	*p*
Tablet Computer Usage Competences	Female	117	64.68	12.10	.285	**.776**
	Male	158	64.22	14.10		
Tablet Computer Feature Awareness	Female	117	35.02	7.65	1.32	**.188**
	Male	158	36.25	7.59		
Tablet Computer Advanced Level Usage Competences	Female	117	36.63	7.84	.496	**.620**
	Male	158	37.11	8.22		
Tablet Computer Literacy	Female	117	136.34	25.31	.387	**.699**
	Male	**158**	**137.60**	**27.86**		

The findings suggest no significant differences were found for the students' total scores for "Tablet Computer Usage Competences", "Tablet Computer Feature Awareness", "Tablet Computer Advanced Level Usage Competences" and "Tablet Literacy" in terms of the gender variable.

Table 3. The Tablet Computer Literacy Levels of the Students in terms of the Grade Variable

	Grade	N	$\bar{X}$	*SD*	Source of Variance	df	Mean Squares	*F*	*p*
Tablet Computer Usage Competences	1.Grade	64	62.0	13.5	Inter-group	3		6.65	.000
	2.Grade	66	67.8	11.6	Intra-group	271	1102.2		
	3. Grade	62	68.4	9.38	Total	274	165.7		
	4. Grade	84	60.6	15.2					
Tablet Computer Feature Awareness	1.Grade	64	34.2	8.04	Inter-group	3		2.64	.049
	2.Grade	66	36.9	7.37	Intra-group	272	151.5		
	3. Grade	62	37.2	5.95	Total	275	57.24		
	4. Grade	84	34.7	8.35					
Tablet Computer Advanced Level Usage Competences	1.Grade	64	35.5	8.44	Inter-group	3		3.19	.024
	2.Grade	66	38.4	7.08	Intra-group	272	202.4		
	3. Grade	62	38.5	5.57	Total	275	63.36		
	4. Grade	84	35.5	9.53					
Tablet Computer Literacy	1.Grade	64	131	28.4	Inter-group	3		5.14	.002
	2.Grade	66	143	24.1	Intra-group	271	3527		
	3. Grade	62	144	18.8	Total	274	685		
	4. Grade	84	130	30.2					

As a result of the analysis, significant differences were found in the tablet computer literacy levels of the students in terms of the grade variable. Scheffe Test was applied in order to identify between in which groups these significant differences occurred.

Table 4. Results of the Scheffe Test

	Grades		Mean Dif.	*p*
Tablet Computer Usage Competence	2.Grade	4. Grade	7.18	.011
	3. Grade	4. Grade	7.81	.005
Tablet Computer Literacy	2.Grade	4. Grade	12.36	.045
	3. Grade	4. Grade	13.26	.029

As a result of the Scheffe Test, the tablet computer usage competence and tablet computer literacy levels of the students in the 2nd and 3rd grades were found superiorto that of students in the 4th grade.

Table 5. The Tablet Computer Literacy Levels of the Students in terms of the Owning a Tablet Variable

	Owning	N	$\overline{X}$	*SD*	*T*	*p*
Tablet Computer Usage Competences	Yes	123	66.52	11.48	2.39	.017
	No	152	62.71	14.35		
Tablet Computer Feature Awareness	Yes	123	36.82	6.78	2.15	.032
	No	152	34.84	8.16		
Tablet Computer Advanced Level Usage Competences	Yes	123	38.18	7.19	2.37	.018
	No	152	35.88	8.56		
Tablet Computer Literacy	Yes	123	141.54	23.24	2.51	.012
	No	152	133.44	28.88		

According to the findings, significant differences were found for the students' total scores of "Tablet Computer Usage Competences", "Tablet Computer Feature Awareness", "Tablet Computer Advanced Level Usage Competences" and "Tablet Literacy" in terms of tablet computer ownership. In accordance with these differences, the scores of the students who own a tablet are higher in comparison to the scores of the students who do not own a tablet in terms of "Tablet Computer Usage Competences", "Tablet Computer Feature Awareness", "Tablet Computer Advanced Level Usage Competences" and "Tablet Literacy".

Table 6. The Relation of Age, Grade and Amount of Time Spent Using Tablet Computers with Tablet Computer Literacy

	Tablet Comp.	Tablet Aware.	Tablet Advanced Level	Tablet Literacy
Age	-.042	.009	.017	-.013
Grade	-.057	.011	-.016	-.030
Tablet Usg. Year	.138*	.138*	.128*	.146*

According to the analysis, a significant but low-levelrelationship was found between the tablet computer literacy sub dimensions and tablet computer literacy variables only on the beam with amount of time spent using a tablet computer. Hence it can be saidthat with the increase in time spent using a tablet, the scores of "Tablet Computer Usage Competences", "Tablet Computer Feature Awareness", "Tablet Computer Advanced Level Usage Competences" and "Tablet Literacy" are increased.

RESULTS AND DISCUSSION

Currently, technology plays an effective and active role in every aspect of life. Technological devices are changing every day and technology is used by teachers as a tool to answer every need in the educational environments, just as in daily life (Alkan, 2005; Akpınar, 2005; Deniz, 2000; İşbulan, 2011; Van Wyk&Louw, 2008). The use of technological products in education facilitates students in listening for longer periods and comprehending the topic deeply, compared to the conventional methods. With the technology being used in education, besides intenalizing information, individuals also gain the competences in terms of how and

where the information will be used.

Every passing day, the technological devices integrated into the education systems bring different perspectives to education. With the FATiH Project, the education processes supported with technology hold an important position in the Turkish education system. One of the most important building blocks of this process is the tablet computer distributed to the students and teachers.

Tablet computers which can ease the teaching and learning process also raise many problems. Although the order of importance of the encountered problems in tablet computer use in the teaching-learning process vary between teachers and students, many problems are common. Misuse of tablets in the teaching-learning process are concerns such as being often used especially by students to play games, listen to music and watch films, hence affecting the classroom learning environment negatively, while also affecting in-class participation and interaction. Other problems include causing waste of time, not being suitable for operation, and tablet computers having a negative effect on interest in printed material (Çetinkaya & Keser, 2014). Despite these concerns, tablets continue to take their place within the education systems with the development of technology. Therefore, the teachers who will sustain the education process with the tablet computers are expected to be tablet literate and able to use the tablets in their daily lives and classrooms effectively.

Findings of our study show that the tablet computer literacy levels of the Sakarya University Sports Sciences Faculty Physical Education and Sports Teaching Department students are observed to be at a high level. Considering the fact that the group consists of students who can be described as digital natives, this is an expected result. In addition, the tablet computer literacy skills and sub dimensions were compared in terms of various variables. As a result of the analyses, while no difference could be found in terms of gender, significant differences were found in terms of the grade and tablet ownership variables. While the difference caused by the grade variables is thought to be caused by the characteristic of the group, the fact that the students who own a tablet have higher literacy skills than the students who do not own a tablet, is an expected result. The tablet computer literacy skills of the students were observed to be increasing in proportion to the increase of tablet computer usage time.

Previous research showsthat including tablets within the class processes and correct use of tablets plays an important role in increasing the student success rate (Cant & Cooper, 2014; McDermott & While, 2013; Farmer et al., 2014). The fact that tablet literacy of the students in this study is at high level can be an indicator that their effectiveness in education will increase when they become teachers in future. At the same time, high tablet literacy levels can result in favor of the students in terms of adopting new technologies (Boticki, Baksa, Seow&Looi, 2015; Lu, Meng,& Tam, 2014).

In conclusion, results of the study suggest that tablet literacy skills are related to tablet ownership and increase in proportion to the time spent using the tablet computer. Therefore, the priority of tablet distribution to teachers within the scope of the FATiH Project will enable teachers to support the tablet with various educational applications. The completion of content suitable for the tablets will play an important role in the success of this project. Renewal of tablet hardware andsoftware, the preparation of a guide for effective tablet use and regular updates for this guide are recommended.

REFERENCES

Akpınar, Y. (2005). *Bilgisayar Destekli Eğitimde Uygulamalar*. Ankara, Turkey: Anı Yayıncılık.

Alkan, C. (2005). *Eğitimteknolojisi*. Ankara, Turkey: Anı Yayıncılık.

Blackall, L. (2005). Digital literacy: How it affects teaching practices and networked learning futures, a proposal for action research. *International Journal of Instructional Technology and Distance Learning,2*(10).

Boticki, I., Baksa, J., Seow, P., & Looi, C. K. (2015). Usage of a mobile social learning platform with virtual badges in a primary school. *Computers & Education,86*.

Cant, R. P., & Cooper, S. J. (2014). Simulation in the Internet age: The place of Web based simulation in nursing education: An integrative review. *Nurse Educ Today, 34*(12),1435-1442

Çetinkaya, L., & Keser, H. (2014). Problems faced by teachers and students in terms of using tablet PCs and suggested solutions related to these problems. *Anadolu Journal of Educational Sciences International, 4*(1),13-34.

Deniz, L. (2000). Öğretmenadaylarınınbilgisayaryaşantılarıvebilgisayartutumları. *M.Ü.Atatürk Eğitim Fakültesi Eğitim Bilimleri Dergisi, 12,* 135-166

Ellington, A. J., Wilson, J. H., & Nugent, J. S. (2011). Use of tablet PCs to enhance instruction and promote group collaboration in a course to prepare future mathematics specialists. *Mathematics and Computer Education, 45*(2)*,* 92-105.

Enriquez, A. G. (2010). Enhancing student performance using tablet computers. *College Teaching, 58*(3)*,*77-84.

Farmer, A., Toms C., Hardinge M., Williams V., Rutter H., & Tarassenko, L. (2014). Self-management support using an Internet-linked tablet computer (the EDGE platform)-based intervention in chronic obstructive pulmonary disease: protocol for the EDGE-COPD randomised controlled trial. *BMJ Open*.

Galligan, L., Hobohm, C., & Loch, B. (2012). Tablet technology to facilitate improved interaction and communication with students studying mathematics at a distance. *Journal of Computers in Mathematics and Science Teaching, 31*(4)*,*363-385.

Ginsburg, L., & Creger, J. (2003). Adult literacy learning and the Internet: An exploratory conversation. *Tech21*.

Gök, T. (2012). Real-time assessment of problem-solving of physics students using computer-based technology.*Hacettepe University Journal of Education, 43,* 210-221.

Holland, S. M. (2004). *Attitudes toward technology and development of technological literacy of gifted and talented elementary school students.* (Doctoral dissertation, The Ohio State University, Ohio).

Isbulan, O. (2011). Opinions of university graduatesaboutsocial networksaccording to their personal characteristics.*Turkish Online Journal of Educational Technology, 10*(2)*,*184-189.

Jones, J. L., & Sinclair, B. (2011). Assessment on the go: Surveying students with an iPad. *Journal of Library Innovation, 2*(2)*,*22-35.

Karunaratne, W. (2003). Case for adult literacy in South East Asia with special reference to Sri Lanka.In *Lens on Literacy.Proceedings of the Australian Council for Adult Literacy Conference*, 21-23 September. Perth, Western Australia: ACAL

Kıyıcı, M., Kırksekiz A., Kiper, A., & Isbulan, O. (2014). Tablet Bilgisayar Okuryazarlığı Ölçek Geliştirme Çalışması. *Unpublished Scale.* Sakarya, Turkey.

Koile, K., & Singer, D. (2006). Development of a tablet-PC-based system to increase instructor-student classroom interactions and student learning. D. Berque, J. Prey, & R. Reed (Eds.),*The impact of pen-based technology on education: Vignettes, evaluations, and future directions.* West Lafayette, IN: Purdue University Press.

Lu, J., Meng, S., & Tam, V. (2014). Learning Chinese characters via mobile technology in a primary school classroom. *Educational Media International, 51*(3).

McDermott, M. S., &While, A. E. (2013) Maximizing the healthcare environment: a systematic review exploring the potential of computer technology to promote self-management of chronic illness in healthcare settings. *Patient Educ Couns, 92,*13-22.

Milli Eğitim Bakanlığı. (2016). Milli Eğitim Bakanlığı FATİH Projesi. Retrieved from http://fatihprojesi.meb.gov.tr

Mock, K. (2004). Teaching with tablet PCs. *Journal of Computing Sciences in Colleges, 20*(2)*,* 17-27.

Pryor, G., & Bauer, V. (2008). Building a better biology lab? Testing tablet PC technology in a core laboratory course. *Journal of College Science Teaching,38*(2)*,* 44-48.

Sneller, J. (2007). The tablet PC classroom: Erasing borders, stimulating activity, enhancing communication. *37th Annual ASEE/IEEE Frontiers in Education Conference Proceedings Book* (S3J-6- S3J-10).

Shurtz, S., Halling, T. D., & McKay, B. (2011). Assessing user preferences to circulate iPads in an academic medical library. *Journal of Electronic Resources in Medical Libraries, 8*(4)*,* 311-324.

Van Wyk, G., & Louw, A. (2008). Technology-assisted reading for improving reading skills for young South African learners. *The Electronic Journal of e-Learning, 6*(3)*,* 245-254.

Willem, C., Martín, A.,& Antonio, B. (2006). Self-regulated learning and new literacies: An experience at the University of Barcelona. *European Journal of Education,41*(3/4)*,* pp. 437- 452.

Wang, S. (2003). *The development of benchmarks and the selection of appropriate methods to assess technological literacy portion of the natural science and living technology curriculum as required by the 2000 National Curriculum Guidelines of the Republic of China (Taiwan).* (Doctoral dissertation, The Ohio State University, Ohio).