TURKISH PRE-SERVICE TEACHERS' EXPERIENCES WITH CONTEMPORARY TECHNOLOGY GAMES AND PERCEPTIONS ABOUT TEACHING WITH INSTRUCTIONAL GAMES

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Abstract

The present study investigates pre-service teachers' experience about playing technology games and their opinions about using contemporary technology to play games as an instructional tool. The participants are 272 pre-service teachers from a university in Middle Anatolia. The present study used mixed methods. The data was collected through an online survey that was created by the authors. The survey contains demographic questions about the participants` gender, major, whether they play technology games or not, and questions about which technology games they play, their opinions about using technology (IWBs and tablets) to play games for instruction, and for which instructional purposes they plan using technology to play games. Following research questions were investigated for the current study: 1. Whether pre-service teachers play technology games or not? If yes, which technology games they play? 2. Whether pre-service teachers plan to use interactive white boards and tablets that were distributed by the government under FATIH project to play technology games for educational purposes? 3. Whether pre-teachers' opinions about using the IWBs and tablets to play instructional games associated with their gender and playing technology games? 4. For which instructional purposes pre-service teachers plan to use IWBs and tablets to play instructional games? For the second and third questions descriptive statistics and crosstabs were conducted. For the first and fourth questions content analysis was applied. Fifty-four percent (n=148) of the pre-service teachers agreed to use the IWBs and tablets to play technology games for educational purposes while 46% (n=124) did not. There is no statistically significant association between gender and plans using the IWBs and tablets to play instructional games. There was a statistically significant association between who Playing Technology Games and Plans Using IWBs and Tablets to Play Instructional Games. Pre-service teachers who play technology games reported higher scores than the ones who do not play technology games. The participants suggested that using IWBs and tablets to play games would make learning fun and easy. The study has implications for teacher education and K-12 education policy. The present study also adds to the knowledge of whether the Y-generation pre-service teachers find the recent technology games useful for education or not.

Keywords: Instructional games, Tablet computer, Interactive white boards, Pre-service teachers, Y-generation.

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Introduction

Computer games are a fundamental part of new generation`s lives who grow up surrounded by various technologies (Bourgonjon, Valcke, Soetaert, & Schellens, 2010; Papastergiou, 2009). Games are reported having the potential to be an efficient teaching tool by several studies in different fields from history to computer science (Basawapatna, Koh, & Repenning, 2010; Kebritchi, Hirumi, & Bai, 2010; Panagiotakopoulos, 2011; Sung & Hwang, 2013; Tuzun, Yılmaz-Soylu, Karakus, Inal, & Kızılkaya, 2008; Watson, Mong, & Harris, 2011). As the researchers and teachers seek for better and more efficient ways of teaching, using games in the classroom might be one of the ways to improve teaching. Using the contemporary technology games especially in today's world, might be helpful to teaching to the Z-generation children, who were born in 1995 or after (McCrindle & Wolfinger, 2010). The Z-generation was born compatible to the current technology. They play with tablets, computers, smart phones and such other contemporary technology devices readily. Schrader, Zheng, and Young (2006) claim that even if there is a body of literature on negative consequences of video games, there are potential possibilities of using video games as an instructional tool.

Interactive white boards (IWBs) and tablet computers are given among the recent technologies in schools by current studies (Beauchamp & Kennewell, 2013; Bey, 2012; Desantis, 2012). An IWB is a tool that allows using videos, pictures, and several other forms of media on through one device with a big screen. Teachers might design instruction using those various types of media for their students and IWB also allow users to interact with each other (Desantis, 2012). Similarly, tablets have similar functions in a mobile form, which makes them more portable. Beauchamp, Burden, and Abbinett (2015) report tablets are easy to use and learn. Besides, tablets can be used as a motivational teaching and learning tool for

teachers and students (Beauchamp, Burden, & Abbinett, 2015). Playing games using those technologies would create a unique teaching and learning environment in classrooms.

Recently, a nationwide project called FATIH (Movement of Enhancing Opportunities and Improving Technology) is initiated by Turkish Ministry of National Education to integrate touch screen smart tools into the classroom settings. Ministry of National Education reports that schools and classes will be equipped with the latest information technologies including IWBs and tablets with this project (Fatih Projesi, 2016). In this study, we investigate pre-service teachers` opinions and plans about using those technologies for the purpose of playing instructional games, which is reported as an effective learning tool in several studies (e.g., Sung & Hwang, 2013). We examine their opinions in relation with their gender, playing experience in general, and we also examine which instructional purposes they plan to use game playing in their future teaching with IWBs and tablets.

Games, technology games in particular, are acknowledged as an integral part of the changing structure of 21st century classroom (Bourgonjon, Valcke, Soetaert, & Schellens, 2010). Furióa, González-Gancedoa, Juana, Seguíb, and Rando (2013) identify gaming as a useful instructional tool including both traditional games and technology games. Studies report gaming approach support comprehension, attitude, and achievement of students (Kebritchi, Hirumi, & Bai, 2010; Miller & Robertson, 2010; Papastergiou, 2009; Sung & Hwang, 2013). According to Tuzun et al. (2008), with game-based learning, students become independent learners instead of focusing on getting high grades. Educators use or promote to use games for various rationales. Panagiotakopoulos (2011) argues that while students immersed in instructional tasks more, they were also observed to be more motivated when they learn with educational games. Watson, Mong, and Harris (2011) add that when students learned educational concepts with games, the learning environment becomes more student-centered and students to be more engaged.

According to Becker (2007), observing the positive outcomes of digital games as an educational tool relies on abilities of new teachers. They should not be expected to adopt games as instructional tools, if they are not confident about using those games in educational settings and not knowledgeable about the potential of using them. Watson, Yang, and Ruggiero (2010) investigated barriers to game-based learning based on teachers` perceptions. The authors concluded that four main factors were hindering teachers` use of games for instructional purposes: "challenges of implementing games effectively, challenges with using technology, current educational system, and challenges with obtaining games".

On the other hand, Bourgonjon, Valcke, Soetaert, and Schellens (2010) examine student acceptance of video games in an empirical study with secondary school students. They claim that several factors affect student preferences for using video games in instruction. Perceived usefulness and ease of game, learning opportunities offered by the game, and personal experience with video games in general are given as the most influential factors for student acceptance of video games in education. In this regard, we see similarities for teachers and students to accept games as instructional tools such as perceived potential usefulness of game. Additionally, if the technology is easy to use, it is more likely to be acceptable by teachers and students. Some of the earlier studies argue that gender is an effective factor for playing games while some of the studies suggest that gender is less effective among other descriptive variables (e.g., LaPlante, Nelson, LaBrie, & Shaffer, 2006; Papastergiou, 2009). Bourgonjon et al. (2010), for example, report gender effects on student acceptance of video games; however, they report that it is mediated by student experience with video games in general and ease of use.

In this study, we aim to examine pre-service teachers` experiences with contemporary technology games, which type of games they play, their plans for using current technology that would be available in their future classrooms -IWBs and tablets- for instructional

purposes, which potentials they foresee by using games for instruction. We also investigate if their perceptions are related to their gender and game-playing experience. The present study aims to answer the following four questions:

1. Do pre-service teachers play technology games? If yes, which technology games they play?

2. Do pre-service teachers plan to use interactive white boards and tablets that were distributed by government under FATIH project to play technology games for education purposes?

3. Are pre-service teachers' opinions about using the smart boards and tablets to play instructional games associated with pre-service teachers' gender and playing with contemporary technology?

4. Do pre-service teachers plan to use IWBs and tablets to play instructional games for which instructional purposes in the future?

Method

The present study used a mixed method research design by using both qualitative and quantitative data. Because of the notion of the questions, mixed method is found to be the best way to provide deeper information. Research questions require both qualitative and quantitative methods to be answered. Descriptive statistics, cross tabulation, and content analysis were used. Descriptive statistics and cross tabulation were conducted using IBM SPSS 21. The content analysis was done using MS Word.

Participants

Two hundred and seventy two pre-service teachers from the Education Faculty of Eskişehir Osmangazi University in Middle Anatolia participated in this study. Two hundreds and seven (76%) of the participants were female and 65 (24%) of the participants were male. The participants` majors are English Language Education (n=55, 20.2%), Primary School Education (n=49, 18%), Special Education (n=38, 14%), Early Childhood Education (n=32,

11.8%), Computer & Instructional Technology Education (n=32, 11.8%), Elementary Mathematics Education (n=32, 11.8%), Elementary Science Education (n=26, 9.6%), and Theology Education (n=8, 2.9%).

Instrumentation

The instrument of this study was developed by the authors. This is an online survey that has six questions. Two of the questions are open-ended. The survey asks about the participants' gender, major, whether they play technology games, which technology games they play, whether the pre-service teachers think that they will use the smart boards and tablets that was distributed by government under FATIH project to play technology games for education purposes, and why they will use IWBs and tablets to play instructional games. The online survey clearly states that the definition of technology games as follows: 'contemporary technology games such as Need For Speed, Farm Ville, or any other games that are played with computers, tablets, or smart phones'.

Data Collection

This study is a part of a larger research that was established in 2015. Data was collected from 272 pre-service teachers for 2 weeks by using an online survey. Overall procedure took 15 to 40 minutes for each participant. The survey that was used for this study took an average of 5 minutes for each participant.

Results

Findings for Research Question 1

Table 1 presents the frequencies and percentages of participants who said they play technology games and who said they do not.

Table 1

Whether Pre-Service Teachers Play Technology Games

Do you play games using contemporary technology?	Frequency	Percentage
No	80	29.4
Yes	192	70.6

		272	100.0
Total			

If the participants reported that they play games, they were asked which technology games they play. Responses were categorized under eleven themes. The themes along with number of participants who mentioned that they play/used to play that type of games are given in Table 2 below.

Table 2

Type of Technology Games That Participants Play

Themes	Examples	Frequency
Strategy	Candy Crush (20), AA (23), Mario (31), Angry Birds (6), Chess (3)	93
Action & Adventure	GTA (Grand Theft Auto) (16), Subway (14), Farm Heroes Saga (1), 101 (5)	36
Fight	Counter-Strike (12), League of Legends (8), DoTA (Defense of the Ancients (3)	23
Speed	Car racing games (13), Need for Speed (7), Blur	21
Crossword & Mind games	Crossword (4), word games (6), mind games (7), King (3)	20
Simulation	The Sims (12), Euro Truck, Air Control	14
Soccer	FIFA (8), PES (Pro Evolution Soccer) (5)	13
Gambling & Memory games	Rummikub (9), Backgammon (2), Poker game (2),	13
Farming	Hay day (3), Farm Ville (10)	13
Role Playing	Knight Online, Silk road, The Elder Scroll, Dragon Age, Popmundo	5
Other	Dress up games (7), matching (2), architectural games (2), skill games (2), puzzles (1)	14

Total of 192 participants reported which games they play using today's technology. A hundred and thirty-nine (72%) of them were female, 54 of them were male (28%). Participants of the present study mostly play strategy games (f=93). Ninety (65%) of the 139

female participants reported that they play strategy games while 3 (6%) of the 54 male participants play strategy games.

Action & Adventure games are the second mostly preferred games (f=36). Twenty five (18%) of the 139 female participants reported that they play Action & Adventure games while 11 (20%) of the 54 male participants play Action & Adventure games. Fight games are third mostly preferred games (f=23). Three (2%) of the 139 female participants reported that they play Fight games while 20 (37%) of the 54 male participants play Fight games.

In summary, 192 participants reported that they play technology games while 80 of the participants reported that they do not play technology games. A total of 265 Strategy, Action & Adventure, Fight, Speed, Crossword & Mind, Simulation, Soccer, Gambling & Memory, Farming, Role Playing games, and other games have been played by the 192 pre-service teachers who participated in the present study.

Findings for Research Question 2

The second question of the present study is that whether pre-service teachers plan to use IWBs and tablets that were distributed by government under FATIH project to play contemporary technology games for education purposes. Table 3 presents the responses of the participants.

Table 3

Participants' Plans For Using IWBs and Tablets to Play Games

Do you plan to use interactive white boards and tablets that were distributed by government under FATIH project to play contemporary technology games for education purposes?	Frequency	Percentage
Yes, I do	124	45.6
No, I do not	148	54.4
Total	272	100.0

As seen in Table 3, almost half of the participants plan to use IWBs and tablets to play instructional games while almost half of the participants do not.

Findings for Research Question 3

A cross tabulation was performed to breakdown gender and the pre-service teachers' plan to play technology games for education purposes in their future classrooms. The result is presented in Table 4. The Pearson Chi-Square revealed that the relation between gender and plans for using IWBs and tablets to play games was not statistically significant, X^2 (1, N=272) =.565, p>.05.

Table 4

Cross Tabulation: Plans For IWBs and Tablets and Gender

Do you plan to use interactive white boards and tablets that were distributed by government under FATIH project to play technology games for education purposes?	What is your gender?		
	Male	**Female**	**Total**
Yes, I do	38	110	148
	25.7%	74.3%	100.0%
No, I don`t	27	97	124
	21.8%	77.2%	100.0%
Total	65	207	272
	23.9%	76.1%	100.0%

A cross tabulation was performed to breakdown the pre-service teachers' plans for using IWB and tablet to play games and if the pre-service teachers played technology games. The result is presented in Table 5.

Table 5

Cross Tabulation: Plans For IWBs and Tablets and Playing Technology Games

Do you plan to use interactive white boards and tablets that were distributed by government under FATIH project to play technology games for education purposes?	Do you play contemporary technology games?		
	Yes	**No**	**Total**
Yes, I do	114	34	148
	77.0%	23.0%	100.0%
No, I don`t	78	46	124

	62.9%	37.1%	100.0%
Total	192	80	272
	70.6%	29.4%	100.0%

The relation between teachers' plans for using IWBs and tablets to play games and playing technology games was statistically significant X^2 (1, N=272) =6.483, p<.05.

Findings for Research Question 4

One of the survey questions was about for which instructional purposes pre-service teachers plan to use IWBs and tablets to play instructional games. According to the content analysis results, participants` responses were organized under ten different categories: making learning more fun (11 students); efficient/easier/long lasting learning (8); providing engagement and motivation (6); using up-to-date methodology (5); appealing to multiple senses/visualization (4); using as a supportive tool to regular instruction (4); reaching information faster or faster instruction (3); rewarding (2); active learning (1); and using for assessment and feedback (1). Some of the exemplar student comments are provided below:

Children learn better with games.

Today`s students are surrounded by technology and love technology, we can turn this into an opportunity.

Classroom instruction would be more colorful, engaging; it would be equipped with audiovisuals; and using technology might make teaching and learning easier.

I think using technology is an up-to-date approach; it is also practical and would be time efficient.

I can prepare tests with the Elektroy software for formative assessment and I can get instant feedback with the Socrative program.

A couple of participants mentioned that some particular instructional tasks could be easier through playing technology games such as word memorization especially for foreign

language teaching; some mathematical tasks, like calculation games; and using videos and animations. Some pre-service teachers had some concerns about using technology games as well. For example, one of the participants mentioned that if games are used too much, it may cause distraction and another pre-service teacher reported she would think about using technology games based on the number of student in her class implying it would be hard with too many students.

Discussion and Conclusion

As being a member of Y-generation, those born in 1980-1994 (McCrindle & Wolfinger, 2010), the participants of the present study documented that 71% (n=192) of them play with contemporary technology games such as some strategy games or speed games. Most of the participants play strategy games. This result is consistent with the earlier study by Hsu and Chiou (2011). The authors of this earlier study reported that most of their participants, who are pre-service teachers, were playing digital games. On the other hand, Turkish government plans to distribute tablets to students and teachers and equip classrooms with IWBs; so the authors of the present study asked the participants whether they plan to use those devices to play instructional games. Almost half of the participants plan to use those devices to play instructional games while almost half of the participants do not. This result leads more investigation, since Hsu and Chiou (2011) reported that most of the pre-service teachers who participated in their study believe the potential of digital games to improve student learning. It could be further investigated, why about half of the pre-service teachers do not plan to use games in their future classrooms.

Results show that the relation between gender and plans for using IWBs and tablets to play games was not statistically significant. Both males and females equally prefer to use IWBs and tablets to play instructional games in their future classrooms. This is an expected

result because the recent studies argue that gender is a less effective factor than the other demographics (i.e., Papastergiou, 2009).

Results of the present study additionally revealed that the relation between teachers' plans for using those devices to play instructional games in their future classrooms and playing technology games themselves was statistically significant. As expected, if pre-service teachers experience playing contemporary technology games, they are more likely to plan to use instructional technology games in their classrooms using tablets or IWBs.

Lastly, the participants of the present study were asked to answer, if they would, why they would prefer to use those games in their classrooms. The participants reported that they prefer to use those devices to play games in the classroom because they think that the contemporary technology games are fun and they would make learning fun. The pre-service teachers also think that games would support teaching process, ease teaching, attract and motivate students, might be used as reward, and appeal to multiple senses. These results are also parallel with the current literature such as Panagiotakopoulos (2011) and Watson, Mong, and Harris (2011).

Rice (2012) reports one of the reasons hampering classroom use of games is limited teacher knowledge about complex role-playing, graphically dense, and cognitively viable modern games. In this study, we asked pre-service teachers which types of games they played, but we did not investigate if the game types have any association with their plans for using games in their classroom. Future research might search for the answers of the following questions: Why do pre-service teachers prefer to play certain games? Does the type of game they play have an effect on pre-service teachers` perceptions about using technology games in education? Another further research also could be conducted on: Do their major have an effect on pre-service teachers` perceptions about using technology games in education? The

present study also did not investigate why the pre-service teachers would not prefer to play technology games in their classrooms.

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