CASUAL GAME PLAYING FOR THE RELIEF OF LEARNING ANXIETY IN STUDENTS

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ABSTRACT
While much research focuses on people’s preference of the types of technology games, there is little reported on the relationship between learning and emotional development as a result of playing different types of computer and video games. Most theory and research in this area has evolved in Western countries. The present study seeks to determine how casual game participation among students in Taiwan impacts learner anxiety. It is anticipated that the findings will help to decrease learning anxiety. This research provides a greater understanding of the relationship between, technology learning, casual games and strategy games.

The results of this study provide initial evidence that casual game play does not relieve learning anxiety, as has been reported, however, this study provides initial EDA data in support of the development of game learning that engages student learning because when students have high EDA data, it also means they have been engaged in the environment more. The findings show that casual games embedded in the learning content caused less stress in students than strategy games.

KEY WORDS
online learning, game learning, learning anxiety, electrodermal activity, experimental study

1. Introduction
The technology game market is expanding at a rapid rate, despite a lack of research during the evolvement of popularity in casual games. Research conducted early in the history of casual games focused largely on their potentially negative influences on human development, such as lack of learning outcomes, achievement, psychological well-being, and the relationship of young users with their parents (Anderson & Bushman, 2001). More recently, researchers have begun to investigate the positive influences of playing games involving technology. Greenfield (1999) noted that playing electronic games can improve children’s concentration, develop skills and enhance intelligence. Computer and video games are now very sophisticated, provide a diversity of cognitive experiences, enhance skill development and provide opportunities for socialization. However, the attraction for video and computer game users of all ages is that electronic games are becoming an important area for research, particularly with regard to improving their ability to stimulate and attract users and to address the potentially positive and negative effects on users.

Technology is the product of human creations and people have a complicated relationship with it. Technology has become central in the lives people so that individuals no longer make an objective decision as to their personal use habits. Rather, technology is infused with the values, sense of identity, and biases of human beings. While much research focuses on people’s preference of the types of technology games, there is little reported on the relationship between learning and emotional development as a result of playing different types of computer and video games.

Most theory and research in this area has evolved in Western countries. The present study seeks to determine how casual game participation among students in Taiwan impacts learner anxiety. It is anticipated that the findings will help to decrease learning anxiety. This research provides a greater understanding of the relationship between, technology learning, casual games and strategy games.

2. Purpose of the Study
This intent of this study is to determine the influence of casual game play on the relief of learning-related stress among students in Taiwan. This study will examine the following research questions:

1. Does the stress experienced by students represent their level of engagement and motivation while they are engaged in an online learning environment?
2. Do casual games influence student emotions and relieve their learning anxiety while engaged in...
3. Summary of Literature Review

3.1 Emotion and Learning

A result of discoveries in psychology, neuroscience, and machine learning there have been explored in educational theory and the design of learning environments. Human emotions when using machine learning environments will lead to changes in educational theory and the design of online learning environments. (Meltzoff et al., 2009) Learning from probabilistic input provides an alternative to Skinnerian reinforcement learning and Chomskian nativist accounts. Additionally, learning is a social activity, highlighted by young infants who are predisposed to attend to people and are motivated to copy the actions they see others do (Meltzoff & Moore, 1977). Recently, educational technology has increasingly embodied the principles of social interaction in intelligent tutoring systems to enhance student learning (Koedinger & Aleven, 2007). Immordino-Yang and Damasio (2007) suggested that the aspects of cognition that are recruited most heavily in schools, namely learning, attention, memory, decision making, and social functioning, are profoundly affected by and subsumed within the processes of emotion. This framework is used to present that the connections between emotions, learning development and online interactivities. In particular, the important role of emotions in computer education is highlighted.

3.2 Casual Game

A casual computerized game is generally defined as a game that is easy to learn, simple to play and usually nonviolent. The game can be played on the internet, cell phones, and tablets and players can experience the excitement of game play almost immediately. Puzzles and card games are also considered as casual games and can be played on computers, cell phones and tablets. Players learn the game easily and they do not have to have strong technology knowledge or strategies (Prensky, 2005). Casual games are attractive to female gamers and non-gamers because the characters in casual games (Kuittine et al., 2007).

3.3 Electrodermal Activity

Electrodermal Activity (EDA) can be used to measure sympathetic nervous activity. Even small responses can be accurately measured by EDA sensors. Since many emotional responses cause a change in sympathetic activity, EDA can be used to measure emotional signals. One of the most recent technological developments in the collection of EDA data is the Affectiva Q™ sensor which was used by the “engagement pedometer” project of the Bill & Melinda Gates Foundation. Q sensor is a biometric devices wrapped around the wrists of students may help researchers to identify which moments excite and interest the students in the classroom. Such a device can measure the emotional responses of students and inform teachers in real-time which environments students are in and which are out. These data can help educators to design their instructions and hold the attention of students. This bracelet measures subtle changes in the skin of student as the sympathetic nervous system responds to stimuli. The Biosensors usually can make instruments more valid and reliable for the identification of effective teaching and learning methods. This technology may be useful for the collection of emotional responses of student involved in online instruction, in order to test how students engage in online lessons or interactivities.

4. Experimental Methods

4.1 Participants

Participants included 40 university freshmen at 4 different universities in Taiwan. All participants volunteered to join this study. The description of the study was emailed to professors. The emotions of students using learning content and casual games on iPad were investigated. This study was conducted in the small meeting room at universities. The experiments were carried out in different locations, however, same room temperature and lighting settings were used (see Figure 1). Before the test, instructions were provided to participants, and they were asked to complete the general questionnaire. This step allowed the measurement of the baseline for each individual. The test comprised three sections, each of which lasted 3 minutes. The total time of this study was 20 minutes which included setting time and the experimental test. The participants were current freshman students. The English knowledge background of the students was similar, as determined by their English entrance grades. Participants were not experts in game play and were observed individually.

Figure 1. Testing Setting

4.2 Emotional Response Measurements

Participants wore Affectiva Q™ sensors on their left wrists to detect EDA data, as all were right hand users. The major data collected in this study were the physiological responses of participants related to their
stress and stress relief experiences. EDA data were saved automatically in a secured computer accessed only by investigators.

4.3 Experimental Tests

4.3.1 Pressure Task

During the pressure task, participants read one English passage on the computer. The 3 minutes of reading gave them learning anxiety because English is not their native language. The English required level was higher than their English comprehensive skills.

4.3.2 Recess Task

During this task, participants were seated, but played either a casual game or a non-casual game on an iPad. The 3 minutes of game play did not require participants to have prior knowledge of the game. Group 1 completed a difficult online task and played casual games to relieve their stress. The game was “Bubble Season” by TeamLava, LLC and the difficult task was reading passage online. “Bubble Season” is a popular technology mini game which is easy to play, is presented within a comical style, and is free to download and play (see Figure 2).

Figure 2. Casual Game: Bubble Season by TeamLava, LLC

Group 2 played the non-casual game, Civilization Revolution by Firaxis Games (see Figure 3), to relieve their anxiety and stress after they had completed the same difficult task as group 1.

Figure 3. Non-Casual Game: Civilization Revolution by Firaxis Games

4.3.3 Exam Task

After the recess task, they did a test. This task brought participants back to the pressure conditions. This exam was related to the pressure task they read.

5. Discussions

Electrodermal activity (EDA) data were analyzed in Excel and SPSS (The IBM, Inc.). The raw EDA files were exported from Q sensor software with time markers. Median values of emotional responses were calculated from the three task periods for each individual. The first task period (N=23, M=1.40), the second task period (N=23, M=1.89), and the third task period (N=23, M=2.09) when participants played the strategy game in the experimental test. While participants play the casual game, the first task period (N=20, M=1.01), the second task period (N=20, M=1.48), and the third task period (N=20, M=1.34) (see Figure 4).

Figure 4. Strategy Game and Causal Game EDA Data

The results of this study provide initial evidence that casual game play does relieve learning anxiety, as has been reported, however, this study provides initial EDA data in support of the development of game learning that engages student learning because when students have high EDA data, it also means they have been engaged in the environment more. The findings show that casual games embedded in the learning content caused less stress in students than strategy games.

6. Conclusion

Future studies should investigate additional factors, such as student feedback, motivation or achievement to determine the relationship between these factors and the success of online learning content with embedded games. Instructional designers can include games in multimedia learning materials that can improve student learning.
Acknowledgements

This research thanks for the support by Doctoral Student Research Fund and co-director Dr. Edward L. Meyen in the e-Learning Design Lab (eDL) at the University of Kansas. The equipment was supported by eDesign Lab at the University of Kansas. All participants were supported by National Kaohsiung University of Applied Science, National Taiwan University of Science and Technology, Shu-Te University and Kun-Shan University.

References