

A study on relationship between computer games usage and educational progress

Samaneh Hajikhanian^a and Mirsaeid Hosseini Shirvani^{b*}

^aDepartment of Educational Management, Sari Branch, Islamic Azad University, Sari, Iran, Iran

^bDepartment of Computer Engineering, Sari Branch, Islamic Azad University, Sari, Iran, Iran

CHRONICLE

Article history:

Received January 20, 2014

Accepted 30 August 2014

Available online

September 6 2014

Computer games

Decline of study

Learning

Study motivation

ABSTRACT

This paper presents an empirical investigation on the effects of the computer games on some female students who attended the secondary schools in Iran over the period 2013-2014. The population of the survey includes 7542 female students who attend secondary schools in Babol County, Iran. The study selects 364 people as a sample and the sampling was accomplished based on random cluster way. The necessary data were collected using two questionnaires of computer games and decline of study with 25 questions in Likert 5 points and there were validated by experts and specialists in the field of educational technology and psychology. In addition, Cronbach alpha was calculated as 0.828, which was well above the minimum acceptable level. Using Pearson correlation test as well as one-way t-student, the study indicates that most female students of secondary school in Babol County used computer games. In our survey, there was a strong relationship between computer games with decline of study and study motivation, and there was a weak relationship between computer games and learning of girl students of secondary school in Babol County.

1. Introduction

During the past few years, there have been tremendous changes on technology and computer game developments (Laurel, 1991). The increase in use of computer games may create different challenges in human's life (Levy 2001; Hughes et al., 2012). In fact, many people are interested in playing games regardless of their ages. Gentile et al. (2009) gathered information about video-gaming habits and parental involvement in gaming, to detect the percentage of youth who reach clinical-style criteria for pathological gaming. They performed a Harris poll survey on some American youth ages 8 to 18. In their survey, approximately, 8% of video-game players in this sample demonstrated pathological patterns of play. In addition, Pathological gamers spent twice as much time playing as non-pathological gamers and achieved poorer grades in school; pathological gaming also indicated comorbidity with attention problems. Pathological status could substantially predicted poorer school performance even after controlling for sex, age, and weekly amount of video-game play. The results confirmed that pathological gaming could be measured reliably, that the construct exhibited validity.

*Corresponding author.

E-mail addresses: mirsaeid_hosseini@yahoo.com (M. Hosseini Shirvani)

Gentile et al. (2011) measured the prevalence and length of the problem of pathological video gaming or Internet use, to determine risk and protective factors, to identify whether pathological gaming was a primary or secondary problem, and to detect outcomes for individuals who become or stop being pathological gamers. Their prevalence of pathological gaming was very similar to other countries (~9%). Greater amounts of gaming, lower social competence, and greater impulsivity appeared to act as risk factors for becoming pathological gamers, whereas depression, anxiety, social phobias, and lower school performance appeared to act as outcomes of pathological gaming. Video games have become a popular culture. Some observations of young surgeons recommend that video game play could contribute to performance excellence in laparoscopic surgery.

Rosser et al. (2007) studied whether or not there is a potential link between video game play and laparoscopic surgical skill and suturing. They concluded that video game skill could correlate with laparoscopic surgical skills. Training curricula that include video games could contribute to the technical interface between surgeons and screen-mediated applications, such as laparoscopic surgery. Video games could be also a practical teaching tool to help train surgeons. Anderson and Dill (2000) investigated violent video game impacts on aggression-related variables. The study determined that real-life violent video game play was positively associated with aggressive behavior and delinquency. The relationship was stronger for individuals who were characteristically aggressive and for men. Academic achievement was negatively associated with overall amount of time spent playing video games. In addition, they reported that laboratory exposure to a graphically violent video game increased aggressive thoughts and behavior. Shields and Behrman (2000) presented an analysis on how computer use influenced on children's development, whether it increased or decreased the disparities between rich and poor, and whether it could be applied effectively to enhance learning, including recommendations to improve children's access to and implementation of computers both at school and at home.

Many studies have concentrated on the negative effect of computer games on student's learning and educational motivation. Playing games normally has both positive and negative consequences. The positive outcome of playing games may contribute to human life. However, the negative effect may have severe effects on human health. Computer games normally attract more children and juveniles and the negative consequences of these games may hurt their educational backgrounds. For this reason, in this study, we investigate the relationship between computer games and educational shortcoming among female students of guidance level by looking the answers for the following questions,

- 1) What is the range of using computer games among female students of secondary school in Babol County?
- 2) What is the relationship between computer games and female students' educational shortcoming who attend the secondary school in Babol County?
- 3) What is the relationship between computer games and female student's learning of secondary school in Babol County?
- 4) What is the relationship between computer games and female student's educational motivation of secondary school in Babol County?

2. Research method

The population of this study includes all 7542 female students who were enrolled in 44 secondary schools in Babol county during the fiscal year of 2013-2014. The sample size is calculated as follows,

$$n = \frac{N \times z_{\alpha/2}^2 \times p \times q}{\varepsilon^2 \times (N - 1) + z_{\alpha/2}^2 \times p \times q}, \quad (1)$$

where N is the population size, $p = 1 - q$ represents the yes/no categories, $z_{\alpha/2}$ is CDF of normal distribution and finally ε is the error term. Since we have $p = 0.5$, $z_{\alpha/2} = 1.96$ and $N = 7542$, the number of sample size is calculated as $n = 364$.

In this way, first, some regions were chosen randomly and in each region some schools were selected, randomly and students of those schools constituted members of investigation. The data collection tool was two researchers' made questionnaire with 25 questions. The first questionnaire was associated with computer games and the second questionnaire was related to educational shortcoming, learning and educational motivation. This questionnaire was designed based on Likert five points range with answer levels (very much, fairly, somewhat, rarely, not at all) and scoring based was from very less level to very much level, from 1 to 5. The validity of the content and face kind of two questionnaires was confirmed by experts and specialists in the field of educational technology and psychology. Its stability coefficient was obtained 0.83 on sample of 30 people by Cronbach's alpha. Table 1 indicates variables coefficients of the case study. Data were analyzed in two descriptive levels by using frequency tables and tabular diagrams and mean indexes and criteria deviation and in dedication level by Kolmogorov – Smirnov test and were described for determination of distribution kind from normality view, one T sample test and Pearson coefficient of correlation test.

Table 1
Cronbach's Alpha Coefficient value of method indexes

Index	Learning	Educational motivation	Decline of study	Computer games	Total
Chronbach	0.796	0.791	0.814	0.806	0.828

In order to verify whether the distribution of the data are normally distributed or not, Kolmogorov–Smirnov test was used. Table 2 demonstrates the summary of our findings.

Table 2
Investigation of Normality of research variables distribution by using Kolmogorov – Smirnov test

Variable	Computer games	Decline of study	Learning	educational motivation
Raw score	1.326	1.635	1.102	1.113
Sig.	0.182	0.121	0.061	0.081

As Table 2 shows, for all variables, meaningful level became more than 0.05, which implies Normality of data distribution and indicates that for investigation relationship between variables we can use Pearson correlation coefficient test.

3. The results

In present research, for analyzing research questions, SPSS software was used. The first question is the survey investigates the effect of computer games on female secondary students. Table 3 demonstrates the results of t student test for testing the first question of the survey.

Table 3
The results of one T- Sample test in relation with first question

Descriptive statistics			15 = assumed average	
Real average	Criteria deviation	t-test value	Freedom degree	Meaningful level
11.40	4.767	-13.811	363	0.006

As we can observe from the results of Table 3, there was a meaningful difference between two averages when the level of significance was 0.01. In addition, real average value (11.40) is less than assumed average value (15). Therefore, it can be said that there was a meaningful difference between these two averages and the range of using computer games is in high level among female students of secondary school in Babol County.

The second question of the survey investigates the relationship between computer games and decline of study among female students of secondary school in Babol County. Table 4 shows the results of our investigation.

Table 4

The results of Pearson correlation coefficient test in association with the second question

		Computer game		
	Average	53.56	Correlation coefficient	0.342
Deviation	Criteria	1.36	Meaningful level	0.000

Based on the results of Table 4, we can see that meaningful level of test is smaller than 0.05 ($\text{sig} < 0.000$), and also results of Pearson correlation coefficient shows that there was a meaningful relationship between computer games and decline of study of girl students of secondary school. In addition, according to correlation coefficient value ($r = 0.342$) we can say that there was a positive and meaningful relationship between two variables. In other words, by increase of range of using computer games, decline of study of students increases.

The third question of the survey tries to find out about the relationship between computer games and female student's learning of secondary school In Babol County. Table 5 summarizes our results.

Table 5

Pearson correlation coefficient test in relation with third question

		Computer games		
	Average	14.31	Correlation coefficient	0.145
Deviation	Criteria	3.97	Meaningful level	0.006
Learning	Criteria deviation		Number	364

Based on the results of Table 5, meaningful level of test is smaller than 0.005 ($\text{Sig} < 0.006$). In addition, the results of Pearson correlation coefficient show that there was a meaningful relationship between computer games and female student's learning of the secondary school. According to correlation coefficient value ($r = 0.145$), it can be said that there was a positive and meaningful relationship with weak severity.

The last question of the survey investigates the relationship between computer games and female student's educational motivation of secondary school in Babol County and the results are given in Table 6 as follows,

Table 6

Pearson correlation coefficient test in relation with forth question

		Computer games		
	Average	11.83	Correlation coefficient	0.555
Educational motivation	Criteria deviation		Meaningful level	0.000
			Number	364

According to the results of Table 6, it is considered that meaningful level of test is smaller than 0.05 ($0.000 < \text{sig}$). Results of Pearson correlation coefficient show that there was a meaningful relationship between computer games and female students' motivation. In addition, according to correlation coefficient value ($r = 0.555$), it can be said that there was a positive and meaningful relation with strong severity.

3. Discussion and conclusion

Results of the first question of research implies that most female students of the secondary schools in Babol county used computer games and most respondents played these games to fill their free times. These results are accompanied with the finding of (Gentile et al., 2004, 2011). Although researches implied that boys were more interested in computer games. Therefore, according to negative effects of computer games on educational status of students this knowledge is necessary for responsible of education that maybe in future not far apart, society may deviate from the way of improvement and growth because of using computer games, enormously. Results of the second question of research indicate that there was a relationship between computer games and students' decline of study. These findings are consistent with results of Gentile et al. (2004, 2009).

Findings of the third question of research imply that there was a weak meaningful relationship between computer games and female students' learning in the secondary school. Computer games can both increase and decrease learning. Changes in securities, skills, attitude and behavior, are the result of learning. As these games create discontinuity, aggression and anxiety in children and juveniles and students, they have many effects on interactions and union and integration and socializing them. Therefore, there should be defined boundaries between useful or non-useful cases, lifesaver or dangerous cases, helpful or harmful cases in using computer games.

Results of the fourth question imply that there was a relationship between computer games and students' educational motivation. Computer is an indispensable element of modern human life. So avoiding it is impossible, computer game is like this predicament. It is conceded that nowadays the role of computer in human life is irrefutable and dedicates most time of human in life. Nowadays because of limitations for girls, they spend most of their times at home playing with computers. So apart from positive effects of computer in transportation of information and acquaintance with surrounding world of students and doing daily works, using them enormously may have negative effects like decline of study.

4. Suggestion

It is suggested that the number of intelligent schools and classes should be increased in order to observe the application of computer in advancing scientific level of students and their tendency to educational software's instead of non-useful games. Educational activities should be designed pleurably that students require less using these kinds of games. Providers of these games should design some kinds of games to help students in learning and mental ability of students in education. School teachers should blend their teaching methods with some computer entertainment software's that it requires cooperation of Education with some formative companies of computer games to attract attention of students to the purpose of education in such a way that spend their free times in these activities and in a word, increase their educational motivation by this work.

Acknowledgement

The authors would like to thank the anonymous referees for constructive comments on earlier version of this paper.

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