

Computer Games and Its Effect on Attribution of Learned Helplessness Students

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Abstract: Games are increasingly being used as educational tools. Many cognitive skills of a child may be observed during computer game play and in part because they are presumed to enhance student motivation. Motivation is important in learning contexts because it can lead students to make greater effort, seek greater challenges, set higher goals, and has higher achievement. We look at student motivation in games from the viewpoint of attribution theory, which predicts more learning by students who make attributions along certain dimensions, and thus may provide a way of examining this claim in more detail. The goal of this research was to study to determine the effect of Instruction based on Computer games on reducing learned helplessness among the female students, who were studying in Mashhad in 2010-2011 academic years. Selection was random sampling. In this research, the subjects were 40 students of fourth and fifth grade of elementary school female students who were identified as learned helplessness by children's attribution-style questionnaire (CASQ). The experimental and controlled groups were selected randomly. Experimental group was affected by dependent variables for 10 sessions, each session 45 minutes. The method of instruction was based on computer games and research design was experimental. Then posttest was taken from both groups. Covariance analyses and t test were used to analyze the research results. The results showed that there was a significant difference between experimental and control groups ($p \leq 0.05$). The practical purpose of this study is to make use of the research findings in education and counseling.

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1. Introduction

Learned helplessness is formally defined as a disruption in motivation, affect, and learning following exposure to non-contingent (uncontrollable) outcomes. There are three crucial elements to its definition: contingency, cognition, and behavior. Contingency refers to the objective relationship between actions and outcomes; for helplessness to occur there must be no relationship between a person's actions and the outcome he or she experiences. Cognition refers to how individuals perceive the contingency, explain it, and extrapolate from this understanding. The perception of uncontrollability (non contingency) may be accurate or inaccurate, but once it occurs individuals attempt to explain it. From this explanation they make extrapolations about the future and, when learned helplessness occurs, they expect that their behavior will not influence future outcomes. Behavior refers to the observable effects of being exposed to uncontrollable outcomes. Most often it involves a sense of giving up— weaker attempts to control the situation or even failure to try to do so at all—a behavior incompatible with new learning. The response is also accompanied by negative emotions such as anxiety and sadness.

A theoretical framework that is useful for understanding motivation in a learning context is achievement attribution theory (Weiner, 1972). Based on the assumption that humans are rational decision makers who seek to understand the causes of their own behavior, attribution theory describes the explanations that people make for events in their life. In particular, achievement attribution looks at how people explain their performance at tasks. Achievement attributions are described along three causal dimensions that have been shown to be critical factors in the attribution process. Locus of control refers to whether the cause to which events are attributed is internal (e.g., high ability) or external (e.g., a difficult test) to the student. Stability refers to how constant the perceived cause is over time; for example, some students might consider ability to be stable over time, while others believe it can change. The third dimension, controllability, refers to the belief that the perceived cause can be or not (Weiner, 1986). These attributions are important because they tend to lead to behavioral changes that affect learning. Students who attribute their success to internal and controllable causes like amount of effort put forth, and attribute failure to unstable causes like an exceptionally difficult test or lack of effort, tend to

have better learning outcomes. Those who attribute success to external causes like luck and attribute failure to stable internal causes like lack of ability tend to have lower learning outcomes; these attributions may be termed 'maladaptive', particularly when they are inaccurate. These attributions also seem to be causal; a number of studies have shown that we can retrain students to make successful attributions, or those that lead to more learning (e.g., Perry, Hechter, Menec, & Weinberg, 1993). Therefore, if improving attributions helps learning, understanding people's attributions in games.

Good video games are in form of stages, which show continuous relation development between game and players and decrease failure experience, players can resume the game from where the failed. Therefore students do not fear to be defeated and encourage taking risk, discovering and trying unknowns. As a matter of fact, in playing failure is good, but students in schools rarely face with risky atmosphere (Gee, 2003). Some researchers who studied all aspects of pedagogical computer games, instead of introducing them threatening, they called them new culture which have to be welcomed with open arm and use them in a proper way (Gunter, 1999). Turning to the issue that computer and computer games, nowadays, are part of a new generation who are developing and progressing, and most of Iran's problems and critical issues in Educational systems are due to failing in use of psychological findings in treatment and training, especially for those students who feel helpless and are experiencing depression and pessimism emphasize on most catastrophic reason for failure, the importance and necessity present this study as a new method or educational complementary and stress the importance and necessity of this research.

1.1. Review of the Related Literature

Nowadays, computer software is example of powerful cognitive tools and they are also called "cognitive technologies", "mind technologies" and "mind tools" (Santrock, 2008). Computer games not only encompass special symbolism system, but also realize this in terms of goal-directed activity and with immediate result. One of the main reasons that make these computer games so popular is goal-directing activity, and maybe it is a good reason for their capabilities of using and motivating cognitive skills (Gunter, 1999).

Computer games are not only considered as important cultural artifacts, but also have a significant cognitive value. By introducing games to the class, the first thing that we expect to happen is the increase in motivation (Squire, 2005). Computer games can teach experiments, problem solving, cognitive skills such as memory, visuospatial, motor, frustration tolerance and

meta-cognition and other high levels of skills. The basic research on proper computer games revealed that these kinds of games lead to internal motivation, entertainment, controlling, challenging, and curiosity (Malone, 1981, Cordova & Lepper, 1996, as cited in Squire, 2005) and develop children thinking skills (Chang & Chen, 2009). Also it is assumed that playing in class increase player's willingness for developing new skills, accepting new roles and having a better understanding of the world from proficient point of view (Gee, 2007 & Squire, 2007).

According to Prensky (2001, cited in Reinders, 2001) games share: 1) rules 2) goals and objectives 3) outcome and feedback 4) conflict, competition, challenge, and opposition 5) interaction 6) the representation of a story

Students in educational places can develop their previous abilities through new tools and acquiring new skills. Computers and computer games, because of their interactive nature, cause mastery simultaneously. Playing such games is a powerful tool for increasing and developing of students' self-confidence that is socially disorder (Linch, 1983, as cited in Gunter, 1999).

Owsten (2007) in a study categorized playing computer games as an education activity that can create motivation and interaction in students in useful activities subject matters. The results indicated that playing computer games could help student to improve their ability in maintaining the content, comparing data presented and using opportunity and acquiring skill. Gee (2006) stated that video and computer games involve in a new art form. These games include a set of joys, learning and cognition development and life expansion that we expect them from art. The games create the approximate area of development in which child always act beyond his/her age, daily behavior, and it seems that child look like more than s/he is (Vygotsky, 1967, 1993, as cited in Gerdler, 2001). Playing create approximate development area and include both cognitive and socio-emotional development. Learning is the ultimate goal of playing (Verenikina et al, 2003). This finding indicated that computer-based video game playing not only can improve participants' fact differentiation/recall processes, but also promotes problem-solving skills by recognizing multiple solutions for problems. The broad categories of computer games are basically action, adventure/quest, fighting, puzzle, role-play, simulations, sports and strategy games. Based on one of the findings, when children find a solution for a problem through computer and two-player adventurous games comparing to one-player games, they showed more progression. Two-player games not only increase the general performance but also decrease the normal arguments between the players in such games.

Computer games provide a sense of controllability (Potter, 1998, quoted Qutaiba, 2011, p 1). Lack of control over a situation, will reduce the motivation of response to achieve targets and sense of lack of control over a situation create a negative cognition, which prevents the learning of a given relationship between a particular and specific power and the lack of control is responsible for emotional disorders. On the other hand computer games increases the sense of skills acquisition against the chance and provides them a different meaning of failure from what they experience in the school. The result of this assumption is consistent with results of researches, which has been used in a number of play therapy institutes and centers. Computer games have successfully used for a number of varieties of treatments of cognitive, emotional and motivational impairment. Gardner (1992 quoted Gunter, 1999) claimed that of positive effects of video games is player achievement to an improved self-esteem feeling that occurs following the skills of self-motivation in the game.

Gee (2008) has shown that computer games result in promotion of emotion and cognition leading to decline in frustration. Griffiths (2002) knows dominance and target-orientation of computer games as the main cause of overcoming frustration.

Computer games provide positive excitement (Potter, 1998, quoted Qutaiba, 2011). Griffiths (2002) stated that computer games due to fast and instantaneous feedback and in the experimental conditions have caused an increase in the internal control and positive documents. He has claimed that computer games in pilot study, due to the fast and instantaneous feedback has caused a decline in negative documents. Educational computer games, which are used in order to facilitate social and interpersonal skills learning lead to improvements in attribution and thus reduce the frustration through role playing and working in groups (Ogan et al 2008).

With regard to above-mentioned and assuming that most of Iran's society' educational and behavioral treatment system are due to failing in use of psychological findings in treatment and training, especially for those students who feel helpless and are experiencing depression and pessimism and as a result show weak academic performance, this method is known as a new and complementary method of education.

The purpose of the present study was the investigation into the influence of Computer games and its effect on attribution of learned helplessness students. The practical purpose of this study is to make use of the research findings in teaching in educational centers and consoling clinic for those children who are experiencing helplessness and educational problems of

these students can be solved by taking the advantages of such methods and cause academic performance improvement.

This research also studied about

-- *Does training based on computer games reduce learned helplessness?*

- *Does training based on computer games increase positive attribution of events?*

- *Does training based on computer games reduce negative attribution of events?*

Based on research questions, other hypotheses are as follows:

- a. **Hypothesis 1:** the rate of learned helplessness among female students having been trained based on computer games method are less than those that have not been exposed to this method.
- b. **Hypothesis 2:** the rate of attribution of positive events in female students having been trained based on computer games is more than those who have not been exposed to this method.
- c. **Hypothesis 3:** the rate of attribution of negative events in female students having been trained based on computer games is more than those who have not been exposed to this method.

3. Method

3.1. Subjects:

Subjects in this study were 40 students of fourth and fifth grade of elementary school female students who were identified as learned helplessness by children's attribution-style questionnaire (CASQ), among the 6416 female students, who were studying in governmental schools of Mashhad in 2010-2011 academic years.

In this study phallic cluster sampling was used. That is from 7th district of education in Mashhad, one district and from desired district two elementary schools were selected randomly. Then of these schools two fourth grades and two fifth grades were selected and the numbers of students were 110. Children's attribution-style test was taken, 40 students whose marks were the lowest in questionnaire were selected who were known as the learned helplessness students.

Two classes were selected as experimental group and two classes were selected as controlled group randomly. Each group has 20 students. As the desired population includes two age groups of 10 and 11, the portion of students in each age group in sample is as equal as the portion of the students in population. In this way, that 50% of the sample are from fourth grade and 50% from fifth grade. And this portion is as the same as the portion in our research population.

Control variables were:

- 1) *Age: All the subjects were selected between 10-11 year old students.*
- 2) *Gender: The subjects were females.*

3.2. Measurement tool

The instruments were paper-pencil questionnaires, children's attribution-style questionnaire (CASQ). Measurement tool for this research is children's attribution-style questionnaire (CASQ). This questionnaire was designed by Peterson and Seligman for children between 8 and 13 and contains two positive (pleasant events) and negative (unpleasant events) situations. Each situation has 3 attribution aspects (internal, stable and general). This test was standardized by Heybatollahi (1984) according to Iranian culture with 36, two-choice questions. This questionnaire includes 36 two-choice questions (positive and negative situation, each contains 18 questions) and of 18 questions related to each situation, each of 3 aspects (internal, stable and general) contains 6 questions.

3.3. Procedure

The questionnaire (children's attribution-style questionnaire) was given to subjects, simultaneously 110 answer sheets were collected and scored. Among the samples; there were 50 percent from fourth grade and 50 percent from fifth grade.

The total came to 40 students. 10 fourth grade students and 10 students of fifth grade were as experimental group. Students got familiar with how computers work and play. None of software intended for research had been used by the students in the past. Software was selected in the field of role-playing, exciting puzzles and educational (Arcade Software, Sara and Dara). All the selected software related to Islamic-Iranian culture and was appropriate for age of 10 to 11.

110 sessions (twice a week) for each experimental group (experimental group consisted of two groups of four people and was one of two groups of 6). It is learned at the beginning of the game rule. Then, playing with each other about it, to pay the assessment and judgment.

3.4. Data analysis

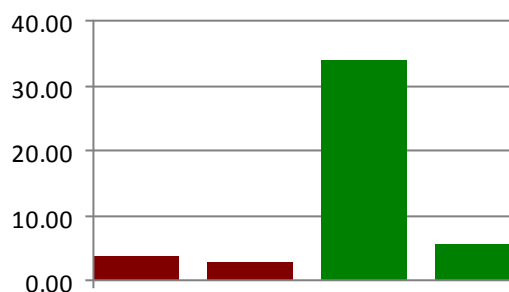
Methods and tools of data analysis

Analysis of covariance was used in order to analyze the data obtained from this project. Based on this method, the mean of posttest was compared after the adjustment of pretest scores. This means that first, before implementing any researches, differences that may exist between the two groups are neutral, and then the mean of pretest scores of both groups (after adjustment) are calculated and compared.

Significant differences between the two groups reflect the effect of independent variables (training based on computer games) on the dependent variable (learned helplessness).

Evaluation of research hypotheses

Hypothesis 1: the rate of learned helplessness among female students having been trained based on computer games method are less than those that have not been



exposed to this method. Based on values of the total mean of positive and negative positions and values of the test statistic in the following table we can infer that there was not a significant different between a pre-test scores in both control and experimental groups.

Fig 1: The average reduction in negative situations and increase in positive positions

Table 1: The average amount of learned helplessness

	group	average	Standard deviation
pretest	experimental	3.600	3.202
	control	2.800	2.118
Post test	experimental	33.99	1.997
	control	5.450	3.967

Table 2: Summary of covariance analysis of comparing the mean of posttest scores of the positive and negative situation after adjusting pretest scores in experimental and control group

Source	F	Sig.	Partial Eta Squared	Observed Powerb
Rate of increase in positive and decrease in negative situations	738.75	0.000	0.582	1.000

Given the value of pre-test and post test in both groups we can conclude that the null hypothesis, or the hypothesis in which " there is no significance between the rate of learned helplessness among female students having been trained based on computer games method and those that have not been exposed to this method" is rejected at the significance level of 5%

and 95% confidence in which the rate of learned helplessness among female students having been trained based on computer games method are less than those that have not been exposed to this method. Based on the findings in significant it was F ($p \leq 0.05$).

Therefore, there are significant differences between the mean of posttest scores of attribution style in both experimental and control groups after adjusting pretest scores. In other words, training based on computer games reduce the amount of learned helplessness. Based on this 58% of individual differences in experimental and control groups related to the impact of computer-based training game.

FHypothesis 2: The rate if positive events attributions of schoolgirls having been trained based on computer games method are less than those that have not been exposed to this method.

Based on values of the mean of positive and negative positions and values of the test statistic we can infer that there was not a significant different between a pre-test scores in both control and experimental groups. And in other words we can accept that both experimental and control groups were similar in terms of negative and positive situations. But after training the experimental group we witness a significant difference between control and experimental groups.

Given the value of pre-test and posttest in both groups we can conclude that the null hypothesis, or the hypothesis in which " The rate of positive events attributions of schoolgirls having been trained based on computer games method are more than those that have not been exposed to this method" is rejected at the significance level of 5% and 95% confidence in which The rate of positive events attributions of schoolgirls having been trained based on computer games method are more than those that have not been exposed to this method. Based on the findings F ($p \leq 0.05$) was significant. Therefore, there are significant differences between the mean of posttest scores of attribution style in both experimental and control groups after adjusting pretest scores. In other words, computer game-based training increases the amount of positive events. Based on this 1 to 83% of individual differences in experimental and control groups related to the impact of computer-based training game.

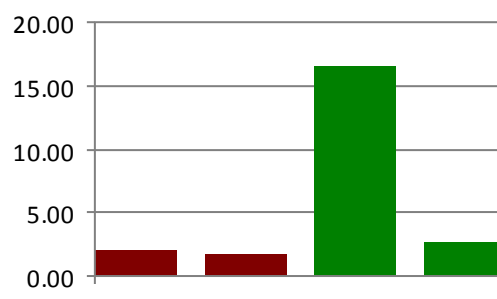
Hypothesis3: The rate of negative events attributions of schoolgirls having been trained based on computer games method are less than those that have not been exposed to this method.

Based on values of the mean of negative positions and values of the test statistic we can infer that there was not a significant different between a pre-test scores in both control and experimental groups. And in other words we can accept that both

experimental and control groups were similar in terms of negative situations. But after training the experimental group we witness a significant difference between control and experimental groups.

Table 3: The average score of positive events increase

	group	average	Standard deviation
Pre-test	experimen tal	2.05	2.305
	control	1.7	1.559
posttest	experimen tal	16.6	1.314
	control	2.7	2.13



ig 2: The average score of positive situations increase

Table 4: Summary of covariance analysis of comparing the mean scores of posttest positive events after adjustment Pretest scores in experimental and control group

Source	F	Sig.	Partial Eta Squared	Observed Power ^b
Increasing positive events	1325.31	0.000	0.834	1.000

P-value=0.00

Training based on computer games decrease total attribution of negative events. Given the value of pre-test and posttest in both groups we can conclude that the null hypothesis, or the hypothesis in which " The rate of negative events attributions of schoolgirls having been trained based on computer games method are more than those that have not been exposed to this method" is rejected at the significance level of 5% and 95% confidence in which the rate of negative events attributions of schoolgirls having been trained based on computer games method are less than those that have not been exposed to this method. Based on the findings F ($p \leq 0.05$) was significant. Therefore, there are

significant differences between the mean of posttest scores of attribution of negative events in both experimental and control groups after adjusting pretest scores. In other words, training based on computer games decreases the rate of negative events. Based on this 61% of individual differences in experimental and control groups related to the impact of training based on computer games.

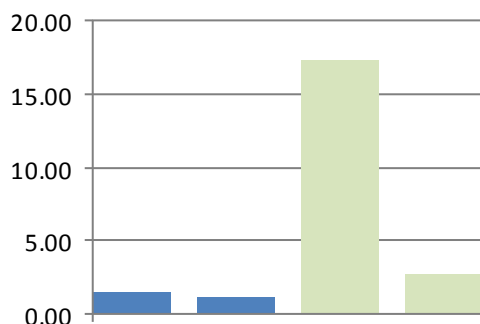


Fig 3. the average score of negative situations reduction

Table 5: The average score of negative events reduction

	group	M	S
Pre-test	experimental	1.550	1.276
	control	1.100	1.252
Post test	experimental	17.300	1.129
	control	2.2750	2.447

3. Results and Discussion

In this study, a hypothesis was taken into account to investigate the effect of training based on computer games, learned helplessness decreasing. Analysis of covariance was applied to test this hypothesis. Research results indicate that the computer game based learning, can put children into a challenging situation to develop those specific cognitive skills and make them learned and entertained. On the other hand in the case of the pessimists, who are involved helplessness feeling and have a false belief and cognition, teacher or counselor or facilitator try to correct them, and change their attributions from lack of talent and ability to lack of efforts and in this regard provide them with more self-image, self esteem and efforts, and prevent them from repeated failure and its consequences which will ultimately lead to helplessness and depression. When students are trained based on computer games they have a true feeling of control and empowerment. They feel that they will dominate on what they do. On the other hand "role-playing" software show us how people act powerfully and with high motivation to discover or create a new identity or role. Good game allows people to build their

new world and at the same time more deeply learning is obtained. Increasing positive events and decreasing negative events from fiction role-playing games are example of the effects of computer games.

Table6: Summary of covariance analysis of comparing the mean scores of posttest negative events after adjustment Pretest scores in experimental and control group

Source	F	Sig.	Partial Eta Squared	Observed Powerb
Decreasing negative events	1258.11	0.000	0.610	1.000

Significant factors in this study can be factors such as:

1. Being recent and a new type of training and its motivation aspect, which, unfortunately, most schools act poorly or even negatively in driving motivation. Emotions are a key source of motivation for directing the idea, learning and problem solving. Computer games work perfectly as a form of entertainment training in connecting emotion and problem solving. Our feelings in evaluating the information and actions can help us to receive feedback when we perform in the world and explain how to assess or evaluate the concept. Feeling of helplessness, pessimism and extreme frustration, anger and fear can overwhelm our thinking and undermines learning, which is called emotional filters.

2. staging in computer games have been set from easy to hard.

3. The experience of failure for students is not the same as other tasks, the value of failure in computer games have been decrease and the key role of failure allows students to test different assumptions.

4. Collective and cooperative involvement, since competing in computer games are seen as a social relationship there is a close connection between competition and cooperation while it is not so in school.

5. Role-playing and simulated programs, in this role-playing students experience a feeling of choice, strong feeling of possessing, and also they are able to produce and not only consume and that leads to a deep and optimistic learning.

6. When computer games were approved as a tool, teacher using revers engineering organizes the subject matters in form of game, which totally includes concepts such as tool intermediation and the concept of approximate area of growth and activity. Fortunately, we can reform children's inappropriate behavior through different pedagogical and therapeutic ways, which results in removing frustration.

Learned helplessness in people results from their inappropriate and incongruous style of definition and since this style has rooted in one's cognition and

beliefs we can modify them using methods based on activity theory namely computer games. The acceptance of main hypothesis of this research indicates the effectiveness of this method in modifying definition style and hence reducing helplessness.

Good computer games reduce the experience of failure because the player can resume from where he failed. Therefore, players never scare of failing and are encouraged to take risk, discover and test unknown things.

This hypothesis that “The rate of positive events attributions of schoolgirls having been trained based on computer games method are more than those that have not been exposed to this method has been proved and it shows that by modifying person’s inappropriate beliefs and attributions we are able to develop an ability inside him by which he can make a connection between successes and happy events with ability. Student who connects his success to some external factors such as chance and so on, doubts about his abilities and it might do a damage on his self-esteem and lead to helplessness which then cause frustration. The more a student enjoys from internal attribution of positive events, the less s/he has problems with mental health, self-esteem and educational performance and is safe with haplessness and frustration. When a student thinks that his success comes from factors, which are stable and permanent, next times s/he will try more and except more for success. In Seligman and colleagues (1999) view, the reaction of optimistic children to happy events of life differs from those pessimists. Children who believe that happy events have permanent factors are more positivistic and optimistic than those who believe these events have contemporary factors. Optimistic children, for defining happy events for themselves refer to permanent factors. They point to abilities and features, which are always with them, such as hardworking, being loved or loved one.

In “Alavi Detective”(one of the game plays that was considered) game they stated the happy events of successfully finding the lost items as “I found the evidence because I searched the room carefully.”

This hypothesis that the rate of negative events attributions of schoolgirls having been trained based on computer games method are less than those that have not been exposed to this method has been proved. The acceptance of this hypothesis indicates that we can teach students to believe that they should relate their failure and unhappy events to external factors such as chance, level of difficulty of the task and do not relate them to internal factors such as ability, talent and so on. In Seligman and colleagues (1999) view, that whom people put the blame on affects their self-esteem. Children who got used to blame themselves when they fail, have low self-esteem and feel guilty

and embarrassment. Children, who put the blame on other people and situations when an unhappy event comes up, have a better opinion about themselves. Yet, that does not mean to teach children to consider others as guilty when things are against them, the main point here is that teach them how to see correctly in a way that they hold themselves responsible whenever things go wrong and try to modify their behavior and when they are not responsible for what comes up appreciate themselves.

Members consult and cooperate with each other. Holding themselves responsible for whatever goes wrong develops absolute thinking, black and white, and playing cooperative games reduces this feeling. That whom people put the blame on affects their self-esteem. Children who got used to blame themselves when they fail, have low self-esteem and feel guilty and embarrassment; in fact when a problem occurs children should be asked to be realistic. In other words, neither should they reprimand themselves and feel guilty, nor should they relate all mistakes to others. Students can be taught to relate unpleasant events to unstable and temporary factors not to stable and permanent ones. That is, they should not relate their cause of failure to stable factors such as lack of ability or/and lack of talent, but by relating this failure to unstable factors such as less effort or inappropriate conditions, try to compensate their failure.

Seligman and colleagues (1999) view, Children who are at greater risk for depression, believe that the causes of unpleasant events that comes to them, are constant, and accordingly, had argued that the since the cause is permanent, the adverse events are always repeated. Conversely, the children who are faced with the regression with the flexibility and are resistant to depression, believe that the causes of adverse events, are temporary.

Pessimistic child relates adverse events to the deficiencies in his character attributes, while an optimistic child believes that temporary and changeable mood state and other states, are the cause of these events. Therefore, children should learn to use words like "sometimes" and "recently" instead of words "always" and "never" when they face failures, banishment and difficult things.

Students can be taught in case of failure or creation of unpleasant events, only allocate the cause to same case and avoid generalizing it to other conditions. The child must be believed that the cause of adverse events were due to specific rather than general causes, expectations of failure or bad experiences will decrease in the future and if relates threatening events to the general causes then his expectation from the possible unpleasant experiences will increase in future.

Computer games can teach experiment, problem solving, trans-cognition and other high-level

skills. Through games, children are aware of their thinking and beliefs and are taking steps to control them. "Role-playing" software is involved how to discover or create a new identity or role that is motivated and has the power to act on and people recreate themselves in their new world and at the same time in-depth learning is obtained.

Practical and research suggestions:

Suggestions which will be practiced in future researches are as follows:

Due to the limitations that existed in this study some suggestions are proposed to be dealt with in future research. The proposals include:

1. Investigating the effect of computer games training on reducing or eliminating the problems such as aggression, hyperactivity, mild fears and phobia, anxiety, social anxiety, and Autism.
2. The investigation of the effect of training method based on computer games in mental therapy and pain management in children and adolescents treated with chemotherapy.
3. Holding training classes for parents to familiar with teaching methods based on computer games. In role-playing games of false belief and understanding of children will modify and change their attributes from lack of talent and ability to efforts, and in this case provide them with the self-image, self esteem and more efforts. Source of internal control about people's beliefs the role of environmental events impact on their lives. And parents and those who are in charge of education should be the internal model (effort) and in their speech and behavior, depict this attribute style.

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