

The Effect of the Computer Animation Illustrator as a Graphic Software on the Pre-School Children's Creativity Appraisal

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Abstract: This research investigated the effect of the computer animation illustrator on the creativity of pre-school children in Abadan, Iran. Creativity is supposed as a goal that makes people to think. It is a complicated issue which helps the individuals make ideas, insights and speculation to reconstruct their thoughts in any disciplines. Creative education requires children to think from the earliest days of their life. Thus, this study was going to discover the computer animation illustrator on their creativity. This research was a cross sectional research dealt with 34-six year old children. They were trained through 90-min sessions conducted by trained instructors. The test of Form-A of torrancepictorial creativity was given to the children before and after treatment. Results showed that training of children through animation illustrator could significantly enhance children's creativity.

Key words: Creativity, torrance-form a, illustrator, animation, computer, pre-school

INTRODUCTION

Recently, the basic issue is to train people who are thinking well. The educational aims should be changed in order to make people think freely, creatively and critically (Sedaghat *et al.*, 2015). Creativity is an abstract concept since it is an instinct which relates human being to God. Dealing with the environment and solving human beings' social problems could be achieved through creativity (Fleith *et al.*, 2002). Although, there are various and sometimes opposite definitions regarding creative, there is one common concept that believes creativity is an ability which generates ideas and insights and can make new conceptual phenomena a to renew science, aesthetics, technology and society (Selart *et al.*, 2008). In this case, creative people would differ from other people due to three aspects: they have a high scientific level, they have divergent ability of thinking which is situated in there frontal lobe of their forehead. This thinking could be activated when there is just one solution among other solutions and they are able to transfer the nervous networks neurons such as Epinephrine in their frontal lobe.

Therefore, it seems to be the frontal lobe plays an important role in human beings' creativity (Salvi and Bowden, 2016). This has not been dealt with for a long time (Reilly, 2008). In creative education, teachers should not teach the learners anything since this is the learners

who should learn by themselves and understand the scientific issues. This educational program should help the learners to discover issues and find out new ideas (Hayes, 2004). The teacher should make an atmosphere in which the learner. Find out their abilities to think creatively and make a positive attitude towards it.

Training the learners to be creative and have a logical thinking is very difficult but it is possible. Recent studies (Lizarraga *et al.*, 2009) show that critical thinking makes sustainable change and creative thinking among the students. Training the critical thinking is not only a sure way to achieve the main goal of education but it also could be an effective method to gain other educational goal (Zohar, 2008). Creativity is a mental activity which happens among the individuals with higher or moderate IQ. The creative individual is a person who shows curious, high level of imagination, firm decision, critical ideas and ability to make relationships and so forth (Karwowski and Soszynski, 2008).

The effect of creativity could be seen in organizing new ideas. Thus, creativity can be product of experiences (Maisuria, 2005). One of the pioneers of children's creativity showed that there are various levels of creativity among children. The study showed that the level of creativity reached highest level around four or four and a half years old. It decreases the child reaches to kindergarten level or around five years old. The effect of school may limit the children's creativity level. This also reported by other scholars (Vong, 2008).

Critical thinking tests generally deal with thinking ability especially creativity, flexibility, opened thoughts and expansion in their evaluation. Anderson and Cropley (1966) showed that creative individuals can receive understandable concepts of the expansion of understanding are one of the individuals' characteristic which makes them creative. They do not use deletion or censorship of their ideas. This makes them flexible and receptive of others' ideas that help them be risky and make trial and error to find the solutions (Burke, 2008).

Amabil believes that creativity has three characteristics of cognitive skill (specialty), personal characteristics (critical thinking) and motivation which is instrumental or integrative. Amabil believes that these three elements are the basic parts of creativity development (Oppezzo and Schwartz, 2014).

Villalba (2008) presented creative evaluation approaches and divided them into personal (divergent personal type) and social (part) (Villalba, 2008).

Sternberg and Lubart (1991) conducted a research on the "creative investment model" and found that creative people tend to achieve fewer ideas but they present more ideas. Accordingly, there are six sources in this creative theory model:

- Mental abilities
- Knowledge
- Thinking styles
- Personality
- Motivates
- Environment

Buckingham and Clifton (2001) believes that creativity is based on three elements of intelligence, knowledge and skill. Peter Darker believes that there is a need to home talent, knowledge and skill characteristics which help human being to be creative (i.e., curiosity, discovery, constructively and learnability) in the 21 century (Buckingham and Clifton, 2001).

Sternberg (2001) believes that creativity is the human's ability of making new thoughts at the high level that is an integration of innovation, flexibility and sensitivity. This helps individuals reach findings through logical thinking as a useful achievement for the creative person and others as well (Sternberg and Lubart, 2001). Mazlo believes in two type of creativity including primary and secondary. Primary creativity roots in human's sub conscious and it is common among humans but the children may lose it when they grow up. Secondary creativity deals with logical thinking and healthy person who is creative is combining both conscious and subconscious processes (Hennessey, 2003).

In studying the causes of lacking creative education in formal and informal environment, especially in preschool period may be ignored and can be dealt with a basic issue. Thus, with regard to the central effect of education in training creative students, understanding and evaluation of creativity in the ministry of education, especially preschool and primary school levels could be significantly important.

MATERIALS AND METHODS

Design: The present study is a quasi-experimental research design with pre and posttests. Data collection was done through creative test of Torrance Type A.

Research sample population: Sample population included 4 children with the age of 6 who were randomly selected among the children enrolled in Noshin Kindergarten in Abadan, Iran. They were male and female children.

Instrumentation: The conceptual creative test type A: Conceptual creative test is one of the collective tests developed by Torrance who used it as a criterion to evaluate creativity (Kim *et al.*, 2006). In the present study, the nonverbal test of non-verbal version was used. It should be given to primary school students at level 4 or less than this and it can be administered individually and orally. This test included four issues of creativity:

- Liquidity (the power of making more ideas)
- Innovation (the ability of making new ideas)
- Flexibility (making the variety of responses)
- Expansion (note to the details)

Which the participants should make a picture from the starting point of a colorful shape and make a story regarding the picture or shape. In this activity, the expansion and innovation are evaluated. The second activity includes ten incomplete shapes. The participant should complete and name them. In this activity, the elements of liquidity, flexibility, innovation and expansion are evaluated. The third activity included 30 separate pairs and the participant should use parallel line and make several pictures. The test reliability was estimated through Pearson correlation as ($r = 0.80$) and ($r = 0.90$) and the validity of 0.63 (Kim, 2006). In another study conducted the person correlation coefficient of the test with Abedi's creative test was estimated 0.72 and through Cronbach Alpha as 0.86. Clapham (2004) calculated the content validity of the test through Cronbach Alpha as 0.84.

Procedure: At the beginning of the research period, the permission was got from the children’s parents and then each child individually completes the Torrance creativity test with the help of the trainer. The test did not have any time limit and after the test completion, each child returned the class. The pen and paper test was used and the children were asked to complete each test. The session lasted 17 sessions, each lasted 90 min. In classes, the children used software of drawing pictures (i.e., illustrator) through using a computer and with the help of the kindergarten teacher. This software can be used to make pictures and animations. It is one of the most complete vector soft wares which could be adapted with Photoshop Adobe and is also used to do graphic and artistic pictures. The syllabus of illustrator software has been designed for children with the age of 6-11 and enables them to draw, design or make graphic pictures. At the end of the treatment period, the participants completed the creative test of Torrance type A.

RESULTS AND DISCUSSION

Data were analyzed through SPSS Version 21 and paired samples t-test and descriptive statistics were calculated.

Findings: Four basic ethical issues were considered in the non-verbal Torrance test type A:

- Innovation; Being far from common and usual thinking process and habitual thinking
- Flexibility; Moving from one level of responses to the other
- Expansion; Being careful in giving ideas, performance and validate the concepts in a new way to make them acceptable
- Liquidity; Presenting ideas faster and clearer in the form of sentences and concepts

These four activities were used in scoring the Torrance test of creative type A. Table 1 shows that the majority of the participant (58.8%) were male. There is a meaningful relationship in the variable of expansion ($p < 0.02$). However, there is not a meaningful relationship among the variables of innovation, flexibility and liquidity.

Nowadays, societies feel to be more creative in order to face new challenges and international relationships among the countering (Rinkevich, 2011). Creativity is a mental process which is done cognitively. Some scholars believe that creative thinking is a skill and it needs to be trained. Therefore, if the society needs creative people,

Table 1: Descriptive statistics of four activities through illustrator software

Activity (gender)	Frequency	Percentage	Mean	SD	t-values	p-values
Innovation						
boy	20	58.5	2.17	2.20	0.96	0.34
girl	14	41.2				
Flexibility						
boy	20	58.8	1.00	0.80	1.20	0.23
girl	14	41.2				
Expansion						
boy	20	58.8	9.60	4.10	2.30	0.02
girl	14	41.2				
Liquidity						
boy	20	58.8	0.50	1.03	0.50	0.50
girl	14	41.2				

they need to train children in a creative way during the earliest days of their life. If the children’s creating is not encouraged, they do not gain a creative thinking in their adulthood (Sarsani, 2008).

With regard to the importance of creativity training in the preschool period, the present study has dealt with to discover the role of illustrator animation on the creativity development among the children at the 6 year old. Findings of the Torrance creative test showed that there was not a significant difference between male and females’ creativity after 17 sessions of treatment. These findings are in line with Amiri (2007) and Rostami *et al.* (2014) who show that gender does not affect creativity.

CONCLUSION

Findings also showed that innovation, flexibility and liquidity have not significantly different in the pre and posttests ($p = 0.02$). Since, expansion is a helpful skill in generating ideas, this software can strengthen creativity. In a study, Amiri studied 240 male and female children between 4 and 10 year old and showed that just expansion was developed (Amiri, 2007). This result is matched with the current study. It seems that the flexibility score matches with expansion characteristics (Simonten, 2000).

Since, this software is useful to children regarding their attractiveness, it can be used in training the children in preschool and primary school to help the children think creatively and critically. Torrance’s study shows that expansion could be developed from a period of preschool to the primary school level (Torrance, 1968).

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REFERENCES

- Amiri, S., 2007. The creative process in children. *Cognit. Sci. New Ideas*, 9: 26-32.
- Anderson, C.C. and A.J. Cropley, 1966. Some correlates of originality. *Aust. J. Psychol.*, 18: 218-227.
- Buckingham, M. and D.O. Clifton, 2001. *Now, Discover your Strengths*. The Free Press, New York, USA., ISBN:0-7432-0114-0, Pages: 266.
- Clapham, M.M., 2004. The convergent validity of the Torrance tests of creative thinking and creativity interest inventories. *Educ. Psychol. Measur.*, 64: 828-841.
- Fleith, D.D.S., J.S. Renzulli and K.L. Westberg, 2002. Effects of a creativity training program on divergent thinking abilities and self-concept in monolingual and bilingual classrooms. *Creativity Res. J.*, 14: 373-386.
- Hayes, D., 2004. Understanding creativity and its implications for schools. *Improving Sch.*, 7: 279-286.
- Hennessey, B.A., 2003. The social psychology of creativity. *Scand. J. Educ. Res.*, 47: 253-271.
- Karwowski, M. and M. Soszynski, 2008. How to develop creative imagination?: Assumptions, aims and effectiveness of Role Play Training in Creativity (RPTC). *Thinking Skills Creativity*, 3: 163-171.
- Kim, K.H., 2006. Can we trust creativity tests? A review of the Torrance Tests of Creative Thinking (TTCT). *Creativity Res. J.*, 18: 3-14.
- Kim, K.H., B. Cramond and D.L. Bandalos, 2006. The latent structure and measurement invariance of scores on the Torrance tests of creative thinking-figural. *Educ. Psychol. Measur.*, 66: 459-477.
- Lizarraga, M.L.S.D.A., D.A.M.T.S. Baquedano, T.G. Mangado and C.M. Elawar, 2009. Enhancement of thinking skills: Effects of two intervention methods. *Thinking Skills Creativity*, 4: 30-43.
- Maisuria, A., 2005. The turbulent times of creativity in the National Curriculum. *Policy Futures Educ.*, 3: 141-152.
- Oppezzo, M. and D.L. Schwartz, 2014. Give your ideas some legs: The positive effect of walking on creative thinking. *J. Exp. Psychol. Learn. Memory Cognition*, 40: 1142-1152.
- Reilly, R.C., 2008. Is expertise a necessary precondition for creativity?: A case of four novice learning group facilitators. *Thinking Skills Creativity*, 3: 59-76.
- Rinkevich, J.L., 2011. Creative teaching: Why it matters and where to begin. *Clearing House J. Educ. Strategies Issues Ideas*, 84: 219-223.
- Rostami, K., F. Mofidi and I. Fayaz, 2014. Comparative study of the effect of Philip Kam and Mortreza Khosronejad's thought ful stories in the preschool period in Tehran 2009-2010. *Stud. Children Lit. Shiraz Univ.*, 5: 49-72.
- Salvi, C. and E.M. Bowden, 2016. Looking for creativity: Where do we look when we look for new ideas?. *Front. Psychol.*, 7: 161-161.
- Sarsani, M.R., 2008. Do high and low creative children differ in their cognition and motivation?. *Creativity Res. J.*, 20: 155-170.
- Sedaghat, S., Z. Gorjian, H.Z.K. Hoshyari, B. Cheraghian and A.H. Ahangari *et al.*, 2015. The effect of teaching caring plan by the clinical concept mapping on nursing students critical thinking. *J. Med. Educ. Dev. Center*, 5: 345-355.
- Selart, M., T. Nordstrom, B. Kuvaas and K. Takemura, 2008. Effects of reward on self-regulation, intrinsic motivation and creativity. *Scand. J. Educ. Res.*, 52: 439-458.
- Simonten, D.K., 2000. Creativity: Cognitive, personal, revolutionary and social aspects. *Am. Psychol.*, 9: 374-390.
- Sternberg, R.J. and T.I. Lubart, 1991. Creating creative minds. *Phi Delta Kappan*, 72: 608-614.
- Sternberg, R.J., 2001. What is the common thread of creativity? Its dialectical relation to intelligence and wisdom. *Am. Psychol.*, 56: 360-362.
- Torrance, E.P., 1968. A longitudinal examination of the fourth grade slump in creativity. *Gifted Child Q.*, 12: 195-199.
- Villalba, E., 2008. On creativity: Towards an understanding of creativity and its measurements. *JRC Scientific and Technical Reports, European Communities, Europe*.
- Vong, K.I., 2008. Developing creativity and promoting social harmony: The relationship between government, school and parents perceptions of children's creativity in Macao-SAR in China. *Early Years Int. Res. J.*, 28: 149-158.
- Zohar, A., 2008. Teaching thinking on a national scale: Israel's pedagogical horizons. *Thinking Skills Creativity*, 32: 77-81.