The study of the effectiveness of media literacy education on the development of creative thinking of students

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Abstract

This study aims to investigate the effect of media literacy education on junior high school students' creative thinking. The research used a quasi-experimental with a pre-test and post-test control group design. The study sample included all first-grade students from high schools in the city of Tehran. The population of this cluster used the random sampling method in the second section. In this study, in order to measure students' creativity, the Abedi creativity questionnaire was used. Therefore, in the study, both the groups (experimental and control) were administered the pre-test. The media literacy lesson plan had eight training sessions for the experimental group, but for the control group there was no enforcement training. Immediately after training, media literacy was tested. After running the tests for both groups, analysis of covariance was used to analyse the data. The results showed that creative thinking and media literacy education and its dimensions (originality, fluency, flexibility and expandability) had a significant positive impact on students and could also help develop essential skills in them.

Keywords: Media literacy, visual literacy, creative thinking, initiative.

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1. Introduction

One of the most important features of a human is the power of thought and creative thinking is one of the highest manifestations of human thought: a power by which he has so far decided to solve problems and achieve development and excellence. Creativity refers to one of the psychological attributes of any person or the active and powerful knowledge that enables him/her to respond to an issue variedly and fruitfully. In fact, creativity is one's flexibility or one's way of finding several answers to a question, as well as the emergence of an emerging product arisen from the relationship among one's characteristics and materials, events and living conditions. Creativity is considered as a supreme human need in all aspects of his/her life, and it is a wide-ranged development and a jump in the thought of the human that includes the ability to combine previous factors in a new way. It is obvious that creativity is the most important factor in the growth and development of humankind in all fields; today, experts regard creativity as a fundamental knowledge of any change and innovation. Creativity plays a critical role in improving and evolving human life; thus, it is an important factor in the survival of communities in today's highly competitive environment, which is full of problems. Real life issues seem to be multifaceted with multiple options, each of which may create future issues. Most of the issues faced by students at university are divergent from reality and have various answers. Asking students to find a number of solutions needs thinking, exploring, as well as self-examination. Students' ability to apply creative thinking is crucial to solve key issues in their lives.

So far, there have been many theories of creativity and according to the consensus, the creative process refers to the ability to extract past thoughts and experiences and combine them in innovative ways. Gilford (1986, quoted by Kim, 2006) proposes two types of convergent and divergent thinking, considering the difference between intelligence and creativity. Convergent thinking is related to intelligence; however, divergent thinking is a key feature of creativity. Divergent thinking and convergent thinking are two major aspects of human thinking. Gilford believes that creative thinking requires divergent thinking which emphasises on fluency, flexibility, originality and elaboration.

Particular attention should be paid to the development of creative thinking in students; media literacy is one of the topics that is necessarily taught to students. Today, the culture of every community is full of media messages. In today's 'global village', every person can easily access up-to-date world information in any field of human knowledge in less than a few seconds on their mobile phone or personal computer.

Recently, human life has undergone a profound transformation compared to the previous centuries and millennia. Due to the social, educational, economic and cultural complexities, this way of life requires special skills, including high-level thinking. High-level thinking may be considered as a kind of non-algorithmic and complex thinking, often producing a variety of solutions. Various types of high-level thinking have been identified so far, including creative thinking, critical thinking and problem-solving (Miri, David & Uri, 2007).

Creative thinking is one of the aspects of high-level thinking. Conceptual creativity is related to differences in individuals. This concept was invented in order to explain why some people are more capable of inventing new solutions to problems and issues (Jauk, Benedek, Dunst & Neubauer, 2013). Nowadays, psychologists believe that creativity is not innate but rather it can be achieved. Through education, we can teach children to think of unusual solutions to solve their problems and come up with appropriate solutions through divergent thinking (Parsamanesh & Sobhi Faramaleki, 2013). Many definitions have been proposed for creativity so far. Stranburg (2001, quoted by Aahi Is fahani, Neshat Doust & Naeli, 2004) believes that creativity is a combination of initiative, sensitivity and flexibility to theories enabling one to think of a productive result leading to personal satisfaction and others' satisfaction. Nevertheless, now many researchers have come to a unified definition of creativity: creativity refers to the creation of new and useful ideas or solutions (Motyl & Filippi, 2014; Amabile, 1988; quoted by Chen, Li, Li, Zhang & Dong, 2013; Zimmerer & Scarborough, 2008, quoted by Antonio,

Lanawati, Wiriana & Christina, 2014). Some researches are also available in the field of components of creativity. For instance, Amabile (1988, quoted by Chen et al., 2013) divides creativity into three components of special knowledge, creative thinking skills and motivation.

It is obligatory to consider creativity since the development of any society today depends on creative and experienced human resources rather than ground and underground resources. On the other hand, the automation in offices and firms is leading to the unemployment of many employees nowadays; if they are not creative and are unable to create jobs for themselves, they will incur heavy costs for both society and themselves. Therefore, in most societies, progress depends on creative people. Many researches have shown that creativity is nurtured in humans and is regarded more as an acquired talent rather than as an inherent talent (Torrance, 1974, quoted by Badali, Dana, Farokhi Tirandaz & Herfeh Doust, 2013). Therefore, creative thinking is one of the most important skills that students can acquire and develop even in their early years of life and use it in many learning contexts in order to enrich their knowledge acquisition, knowledge production and other skills (Wheeler, White & Bramfield, 2002).

Today, the culture of every community is full of media messages. In today's 'global village', every person can easily access up-to-date world information in any field of interest in less than a few seconds on his/her mobile phone or personal computer. It is not difficult to access information today, but can we process and understand all media messages (including radio and television programmes, newspaper pages, emails, mobile texts, street billboards, subway banners, etc.) available to us daily? Do we have enough time? Can we select computer games, cartoons or television programmes for our children so that they are tailored to their cultural values, age and cognitive characteristics? As an appropriate solution, media literacy can teach one the skills to take an active stand against the media and choose from the vast amount of information available to him/her day and night. The objective of media literacy is to promote critical understanding and active participation (Farahani, 2014).

Education is considered as one of the basic and important pillars of economic, social, cultural and political development; today, its role in improving the living conditions of individuals and society is obvious to all. Hence, it is the main authority and its role is clear to improve the living conditions of individuals and society. Thus, the principal caretakers of this institution, teachers and educators, are among the factors causing the concern of education professionals (Abasi Dovomshahri, 2014). Therefore, as their expertise increases, education will be more successful in reaching the growing society and it will be aliberating institution for human beings and their societies; so, lifelong learning is a necessity of advanced education for teachers and educators, since the importance of learning in human development goes far beyond the perspective of his/her thoughts (Aqazadeh, 1992, quoted by Novin Isfahani, 2009). Unfortunately, the accuracy of information on various media, such as television, internet, newspapers, etc., is a challenge for teachers and students ensuring its validity and reliability. Therefore, evaluating information published on the web is an important aspect of the data collection process (Zarei Zavaraki, Qasemtabar & Momeni Rad, 2013).

Jauk et al. (2013) argue that with the large amount of information coming from different media, it is necessary for learners to have media and information literacy in order to interpret and use information more accurately and to build their knowledge (quoted by Abasi Dovomshahri, 2014). Media and information literacy, as a need and necessity in the information age, by equipping individuals with the capabilities to recognise, largely ensures the need for information, to locate, evaluate and use information effectively and responsibly, as well as the survival and prosperity of this era (Babazadeh, 2009). Media literate people with a reasoned, critical and creative mindset based on knowledge are able to process information and use it correctly in a variety of situations; they are aimed at creating new results due to the precise understanding of the nature of the problem, the normative thinking and the discovery of relationships among affairs. Therefore, media literacy refers to a set of skills that one can rely on to clearly identify what he/she receives from different media,

identify the required information, select and evaluate the most valuable and correct information and finally exploit it.

Since the gap between generations increases in terms of access to information and information acquisition techniques every day, and since the students can easily gain information beyond what their teachers know from the channels and media they know and sometimes even access new content before their teachers, and given the huge volume of media and information resources and its rapid changes in education and ultimately due to the need for creative thinking in students, the researchers decided to examine the impact of media literacy education on students' creative thinking.

The Ministry of Education is one of the greatest ministries in terms of population and its objective is to cultivate thoughtful and creative people. This organisation achieves huge budgets each year to achieve its goal. In addition to the Ministry of Education, other ministries and other organisations also spend huge amounts of money on education. In the face of so many costs, one question comes to mind, what justifies all these costs? The answer to this question is to achieve the goals of these organisations. However, how can we achieve these goals? To achieve these goals, creative and creative people must be nurtured.

Most people, not just our people but also most people in the world, do not think –Why? In what way? What an initiative? – since they do not have the skills needed for this thinking and they are not trained. Thinking is a skill and those who have achieved considerable success in their lives have quickly and effectively learned and applied this skill. As science and technology evolves and information flow develops, people need to explore creative thinking as well as learning creative thinking by using it to organise, classify, compare and evaluate information and to provide context to develop and enhance it.

Today, we live in an era where the space around us is full of information generated by different media and we are in a state of media saturation, requiring and prescribing a media consumption regime (Dehqanshad & Mahmoudi Koukandeh, 2012). To achieve this regime, we need media education for all people, in particular children and adolescents. Today's students must live with the demands of the information society. It is necessary that they already have the abilities and capabilities to live and work in such a society. In this process, the education system is of particular importance since children and adolescents are one of the most important and, at the same time, the most vulnerable part of society. Through recognising the spirit of time and the needs originated from it, the education system can answer the needs based on new circumstances and adapt to it. Thus, it is essential to make fundamental reforms based on the experience of other countries as a foundation for the development in the country, through which the education system can provide students with effective and useful use of communication skills by developing and enhancing media skills in their students.

Given the dependence of the audience on the media and media products, it is essential to be able to analyse, detect, understand and select the media messages, as well as make them resistant to the influences of the media power. In the meantime, media literacy seems to be a necessary skill that can modify the effects of mass media and allow the audience to process the messages of the media with full awareness. Since media playa significant role in shaping and changing the attitudes, thoughts and behaviours of the audience, it is necessary to educate and recognise the methods and practices of the media. In such a circumstance, we must be fairly sensitive about the attitude of children and adolescents of our country to the phenomenon of media globalisation and its effect on the value system and its identity and prepare our country to appropriately respond to this huge global challenge. With the emergence of new technologies, the process of education has been eliminated from the monopoly of schools and education institutions, and the vast world has become an educational arena. In such conditions, how can students create the necessary cognitive and motivational contexts to spontaneously respond to media content? One of the fundamental ways of achieving this goal is to promote thinking in schools and educational centres through using students' media literacy education (Soltanifar, 2008, p.97).

Due to the increasing importance of media literacy in communities as well as the significant advances made in this field all over the world, the issue of media literacy in our country's teacher education courses is increasingly felt. In most countries around the world, with direct and indirect government support, the media provides and citizen training to learn how to deal with the media. Considering the necessity and importance of media literacy, it has been somehow ignored in our country, and it is unclear when media literacy education, especially for children and adolescents, will begin at the grassroots level.

2. Research tools

2.1. Creativity test (CT)

The CT is based on Torrance's theory of creativity and was designed by Abedi in Tehran in 1984. Of course, this questionnaire was revised several times, and ultimately, its 60-question form was developed by Abedi at the University of California. It has 60 three-item questions consisting of four subtypes of fluency, elaboration, initiative and flexibility. Each option is scored from one to three: one representing low creativity, two representing moderate creativity and three representing high creativity. The sum of the scores on each of the four subscales represents the score of the subject in that section, and the sum of the scores on the four subscales shows the overall score of the subject's creativity. The total creativity score of each subject will be between 60 and 180.Questions 1–22 relate to fluency, 23–33 to elaboration, 34–49 to initiative and 50–60 to flexibility. The reliability coefficient of fluency part has been 0.85, 0.82 for the initiative part, 0.84 for flexibility and 0.80 for elaboration. In a study performed on 2,270 Spanish students to determine the validity and reliability of the CT, Cronbach's alpha was 0.75 for the fluency subscale, 0.66 for flexibility, 0.61 for initiative and 0.61 for elaboration (Auzmendi, Villa & Abedi, 1996).

2.2. Package of media literacy education lesson plan

To teach media literacy to the experimental group, an eight-session lesson plan is presented as observed in Table 1.

Table 1. Media literacy education package

Meeting	Meeting title	Description of the sessions
1	Introductory to the course	Introduction, goals of the course, structure of the course, motivation and the importance of the training plan and the pre-test.
2	Film and advertisement analysis	Several clips will be played for the subjects and they will be asked to analyse the goals of the film as well as its outcome; and as the leader, the instructor will investigate the subjects' discussions and analyses.
3	Investigating the media message	In this section of the class, students explore creative techniques used in media messages. In this section, students will be acquainted with the size of the views, camera angle, lens type, composition, lighting, colour and a variety of cinematic codes with the help of the course facilitator and will learn the implications of each of these items. They will then identify these causes and reasons on a media message.
4	The rest of 'Investigating the media message'	In the section three of the class, after presenting a media message, for example, a caricature or a sequence of a film, students will be asked to interpret the message. Given the difference in students' perceptions and interpretations of the same media message, they will be asked to explain the reasons for this difference in attitudes. To guide students' perception and familiarity with this objective, the following guide questions will be asked: Have you ever experienced something like this media message? How close was this message to your real life? What did you learn from this media text?

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		What did you learn from other people's responses and experiences? In fact, the objective of this class was to get students acquainted with the factors influencing audience perception and understanding, such as age, gender, lived experience, education and the like.
5	Investigating the film message	Considering the difference in students' perceptions and interpretations of the same media message, they will be asked to explain the reasons for this difference in attitudes. In order to guide students' understanding and getting them acquainted with this goal, the following guide questions will be asked; for example, media worldviews, attitudes towards women and children, food habits, the way of dressing, behaviour patterns and the like represented in the media. The guiding questions of this section include What values and ideas were presented in this message? What is the worldview of this message? How is representation of this message from different phenomena? What aspects have been ignored in this message?
6	Media news analysis	A few news items from various media will be reported to the subjects, they will be asked to analyse the news and the instructor will guide the subjects as discussion and analysis.
7	Investigating the goals of message senders	Most of the obtained media messages are programmed to gain profit or power. In this section, the purpose may be explained by giving various examples. For instance, commercial or political advertisements are produced and delivered in order to promote goods or services or to express the ideology of advertisers. The guiding questions in this section included Who has been involved in the creation and distribution of the message? Why has the message been sent? Who has sent the message? What do senders get from this message? What are the effects of economic decisions on message construction and content?
8	Conclusion and Closing	Reviewing the previous topics, distributing and refilling the Creative Thinking Questionnaire (post-test), asking and answering the questions, discussion and conclusion of whole sessions and closing the session

3. Research findings

The sample of this study consisted of 31 first-grade high school students in district 2 from the city of Tehran, 16 of whom were in group A (control group) and 15 students in group B (experimental group)randomly assigned to the teaching method groups. It should be noted that all the subjects were female.

To facilitate the understanding of the differences between the pre-test and post-test scores in each of the study groups, the mean scores of each group are separately shown for each of the variable components examined in Graph 1 and Table 2.

Table 2. Mean and standard deviation of pre-test and post-test creativity scores in the control and experimental groups

Test	Group	Mean	Standard deviation	*n*
Pre-test	Control	86	15.145	16
	Experimental	89	13.210	15
Post-test	Control	88	14.027	16
	Experimental	112	7.080	15
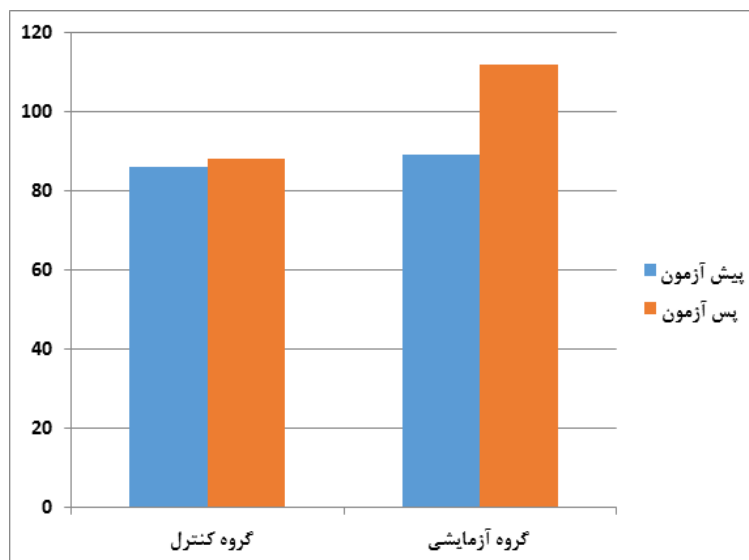
Graph 1. Comparison of means of pre-test and post-test of creativity in the control and experimental groups

3.1. Analysis of research data

3.1.1. Examining the assumptions of using the analysis of covariance
3.1.1.1. Research hypothesis: media literacy education affects students' creative thinking

To investigate this hypothesis, one-way analysis of covariance analysis (ANCOVA) was used .The reason for employing this test is that in the current research design, the researchers used the pre-test as the control variable in order to control the effect of preparation and adjust the effect of this variable.

Some significant assumptions of this statistical test should be examined before using the covariance analysis test, since non-compliance with these assumptions may result in biased research results. These basic assumptions are discussed in the following.

3.1.1.2. The first assumption: normal distribution of data

Kolmogorov–Smirnov's test was used to examine this assumption. As indicated in Table 3, the size of the Kolmogorov–Smirnov Z test was not significant in any of the variables for the control group. The non-significance of this test represents the normal distribution of data.

Table 3. Kolmogorov–Smirnov's test for normality distribution of the control group data

	Pre-test	Post-test
n	16	16
SD	6.145	4.027
Z test	0.816	0.552
Significance level	0.518	0.921

Table 4 presents the Kolmogorov–Smirnov test for the experimental group, showing the normal distribution of the experimental data, since none of the Kolmogorov–Smirnov Z measures is significant.

Table 4. Kolmogorov–Smirnov test for normality distribution of the experimental group data

	Pre-test	Post-test
n	15	15
SD	5.956	3.632
Z test	1.073	0.611

Significance level	0.200	0.849

3.1.1.3. The second assumption: condition of equality of variances of creativity error

Levin's test was employed to test the homogeneity of variance of creativity error. Table 5 presents the Levin test result. As observed in Table 5, the size of the *f*-test is 1.338, with a suitable significance level of 0.253 for this test, which means that there is no statistical difference between the error variances.

Table 5. Levin's test result for homogeneity of creativity error variances

f value	*Df*1 value	*Df*2 value	Significance level
1.338	1	50	0.253

3.1.1.4. The third assumption: condition of homogeneity of regression lines

Interaction between independent variable and pre-test was employed to test this hypothesis. For this assumption to be true, the size of *f* of interaction test must not be a significant. As observed in Table 6, the size of this test is not significant. In other words, this assumption is also true.

Table 6. Interaction between independent variable and pre-test

Source	Sum of squares	*Df* value	Mean of squares	*f* value	Significance level
Independent variable and pre-test	426.433	2	82.716	4.211	0.299

It is observed that all three assumptions of the ANCOVA test are true, which means the use of ANCOVA is permissible.

3.1.1.5. Research hypothesis: media literacy education affects students' creative thinking

Table 7 presents the results of the ANCOVA test. As observed in Table 7, the sum of squares of the independent variables is 2,720.320, leading to an *F* test of 49.589 which is significant at the 1% level. In other words, there has been a significant difference between the control and experimental groups in creativity, even after adjusting for pre-test effect. Given the mean scores of the experimental and control groups in the post-test, it may be concluded that media literacy education has a positive effect on students' creativity.

Table 7. Results of post-test ANCOVA of students' creativity scores after pre-test adjustment

Source of changes	Sum of squares	Degree of freedom	Mean of squares	*f* value	Significance level
Modified model	2,716.800	2	1,253.310	26.492	0.000
Intercept		1	96.660	3.033	0.000
Pre-test		1	112.755	2.594	0.037
Group (independent variable)	2,720.320	1	2,720.320	49.589	0.000
Error	963.645	27	4.035		
Total	13,462.250	30			
Total modified	161.445	29			

4. Discussion and conclusion

With the advent of the 21st century, information and communication systems have increasingly become complex and sophisticated. These complexities have made messages generated by media confuse their audiences around the world with some confusion and hesitation in selecting messages. In other words, in the era of globalisation, and given the expansion of ICTs and increased media outlets, serious debates have been raised concerning the development of management skills and information skills. Recognising the possible uses and abuses, as well as the advantages and disadvantages of the media may help citizens determine the impact of media messages. Given that media is one of the key components of human societies in today's world, media literacy education is

one of the fundamental needs of citizens. The main objective of this study is to investigate the impact of media literacy education on students' creative thinking. It was revealed that media literacy education affects students' creative thinking. Furthermore, four sub-hypotheses of the impact of the experimental method of using media literacy education on the four dimensions of creative thinking were examined. Thus, one main hypothesis and four sub-hypotheses of the present study indicated the effectiveness of the experimental method in the significant increase in the creative thinking scores and its dimensions compared to the control group. In general, the results of this study reveal that media literacy education is one of the necessities of education for students, and this training may enhance their creative thinking skills.

The result of the present study indicated a significant difference between the scores of the control group and the experimental group. These results are in line with the studies of Kermanshahi, Ezzeddin and Badali (2016), Dehqanshad and Mahmoudi Koukandeh (2012), Taqizadeh and Kia (2014), Abasi Dovomshahri (2014), Eisenberg (2007), Moon (2009) and Jamali (2015).

The results of Kermanshahi et al.'s (2016) study revealed that the use of media literacy education on critical thinking skills and its four dimensions (analysis, evaluation, deduction and inductive reasoning) has a positive and significant effect, except for deductive reasoning, and it can develop this necessary skill in the students. Dehqans had and Mahmoudi Koukandeh (2012) conducted a research entitled 'The Study of the Necessity of Educating Media Literacy for Children and Adolescents from the Perspective of Education Specialists in Tehran City', in which the viewpoint of experts in the field of education on the necessity of teaching media literacy to children and adolescents was investigated with goals such as the need to include the subject of media literacy in school curricula, the need to develop educational content for ICTs, the reasons for the lack of development of media literacy of children and adolescents, as well as the role of education system in media literacy of children and adolescents. Moon (2009) in his research examines the relationship between students' critical thinking skills and information and the internet literacy of students. The results of this study show that, in general, there is a significant and positive relationship between critical thinking and information and internet literacy and critical thinking skills (analysis, deduction and evaluation) and information and internet literacy. Only in the evaluation skill, the significance was less than other skills. Moreover, his findings indicate a significant difference between the scores of students' critical thinking skills and information and internet literacy in different disciplines.

In explaining the findings of this study, it may be said that today, communication theories are tended towards avoidance of absolutism and pay attention to the role of audience attributes in their getting affected by media messages. The level of media literacy of students is one of the influential features included in this article as the main variable of research. Communication researchers have supposed that as the degree of media literacy varies across individuals, the degree to which they are affected by media messages will vary too. One of the reasons for the positive impact of media literacy education on students' creative thinking skills may be that having media literacy may critically decode the media messages and consequently treat them properly and not allow these messages to easily change people's lifestyles and thinking to whichever way they want and increase thinking about the events in the communities.

As a good solution, media literacy may teach one the skills to have an active position against the media and to choose from the vast amount of information available to him/her day and night. The objective of media literacy is to promote critical understanding and active participation (Farahani, 2014). Media literacy empowers students as lifelong learners of the media in order to identify the true and untrue contents through using their creative, critical thinking and analysis skills to become a successful learner and citizen.

Ultimately, it may be said that creative thinking is one of the essential skills for the development of each individual. Students must learn the skills necessary for thinking, smart communicating with the

media, using creative and critical thinking and analysing media messages. Media literacy education is one of the factors influencing the development and promotion of creative thinking skills for students.

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