Iranian Journal of Educational Sociology

Iranian journal of educational Sociology
(Interdisciplinary Journal of Education)
Available online at: http://www.iase-idje.ir/
Volume 3, Number 1, March 2020

Investigating the effect of media literacy on creativity skills, critical thinking and problem solving in sixth grade students

Hossein Rezaei Nazari[1], Bahram Alishiri[2*], Seyed Mohsen Bani Hashemi[3], Jamshid Salehi Sedghiani[4]

1. PhD student in Media Management, Islamic Azad University, South Tehran Branch, Iran.
2. Assistant Professor, Islamic Azad University, South Tehran Branch, Iran.
3. Assistant Professor of Radio and Television University.
4. Professor of Allameh Tabatabaei University, Tehran Branch, Iran.

Article history:
Received date: 13 July 2019
Review date: 15 October 2019
Accepted date: 18 October 2019

Keywords:
Media literacy, Creativity, Critical thinking, Problem solving

Abstract

Purpose: The aim of this study was to investigate the effect of media literacy on creativity, critical thinking and problem solving skills of sixth grade students.

Methodology: The statistical population of the present study was the sixth grade students of non-profit schools in Tehran, whose number was approximately equal to 9058 people, of whom 369 people were selected as a sample based on Cochran's formula and according to the class sampling rule. 206 girls (from a population of 5056 people) and 163 boys (from a population of 4002 people) are selected. Data collection tool was a standard questionnaire. The Simon (2017) questionnaire was used to measure media literacy, the Harris (2016) questionnaire was used to measure creativity, the Sarigoz (2012) questionnaire was used to measure critical thinking, and the Sirait (2017) questionnaire was used to measure problem-solving skills. Data analysis method is structural equation technique and data analysis tool is LISREL and SPSS software.

Findings: The results showed that media literacy affects the development of creativity, critical thinking and problem solving skills and these effects are not significantly different between girls and boys. Also, the mediating role of critical thinking in the effect of media literacy on creativity and the mediating role of creativity in the effect of media literacy on problem solving skills in the boys group is stronger than the girls group. ($P < 0.05$).

Conclusion: Therefore, it can be concluded that media literacy has a significant effect on students' creative skills, critical thinking and problem solving.

Please cite this article as: Rezaei Nazar H, Alishiri B, Bani Hashem S M, Salehi Sedghiani J. (2020). Investigating the effect of media literacy on creativity skills, critical thinking and problem solving in sixth grade students, **Iranian journal of educational Sociology.** 3(1): 78-89.

* Corresponding Author Email: bahramalishiri1350@yahoo.com

[DOR: 20.1001.1.26453460.2020.3.1.9.3]
[DOI: 10.52547/ijes.3.1.78]

1. Introduction

Critical thinking is recognized as an essential skill for rational participation in a democratic society, and in today's modern world it is a skill that is more understood as the ability of individuals to challenge their thinking, this ability requires them to set their own standards for Develop analysis, evaluation, and evaluation of their thinking, and routinely use those criteria and standards to enhance the quality of their thinking (Christ & De Abreu, 2020). "Critical thinking is important not only in receiving messages but also in producing meaning" and enables "learning to create personal messages" (Simões & Santos, 2020). Shokrkhah (2001) argues that media literacy is the ability to understand the meaning of media work. They use media to critically evaluate media content, interpret the meaning of messages, and defend media power. Knowing the difference between commercial media and public media can be a kind of structural literacy. From all the definitions given, it can be concluded that media literacy is a set of skills that allow the audience to access and create a variety of communication signals and recognize the nature, importance and basic values of messages (Ghasemi, 2006).

The sciences studied in the field of education are mainly focused on the development of critical thinking and less on the development of creative thinking. The fact that scientific research distinguishes between these two levels leads to the hypothesis that these two types of thinking are different or two types of thinking that require different thought processes and therefore the brain. However, a number of scientists believe that these two types of thinking should be considered as parallel or complementary rather than separate (Lindner, 2019). Critical thinking skills training entered a new phase in 1978 when four projects were explained to the trainers by the US Bureau of Education. These institutions considered the skills presented in this project to include the psychological effects of commercials, distinguishing between reality and story, and understanding the method and content of different types of programming (Bossavit & Parsons, 2017).

Another basic thinking skill is problem solving skills. The problem arises when an obstacle makes our current desired state undesirable, and the problem-solving skill is to find a solution that removes the obstacle and leads the person to his goal (Rodzalan & Saat, 2015). In other words, the solution is to find the right way to achieve a goal that is currently unattainable (James, Hartzler & Chen, 2016). The problem solving method is actually an active learning method and includes five steps: problem identification and definition, data collection, preliminary conclusions, testing results, evaluation and decision making (Altintas & Ozdemir, 2012). In fact, problem solving is a vital skill for living in the present age, it requires special and purposeful strategies by which one defines problems, decides to take solutions, and applies problem solving strategies. Takes and monitors those (Cooke & Kemeny, 2017). According to Fontanari (2017), problem solving is a cognitive-behavioral and innovative process by which one identifies or develops effective and adaptive strategies to deal with everyday problems. According to Căprioară (2015), people who develop critical thinking will be able to analyze, evaluate and judge things and solve individual and personal problems in their lives better.

Thus, curricula that are developed for the field of education usually target one of these two ideas, or at best include the implementation of parallel curricula that foster both types: in However, the educational experience that fosters critical thinking is different from that which fosters creativity (Chang & Chiu, 2012). More comprehensive approaches to thinking pave the way for new curricula, many of which are not aimed at one type of thinking, but at enabling students to think comprehensively about different areas and different types of stimuli, Considers educational experiences (McGowan & Keeling, 2014). When students are in an environment that is encouraged by critical thinking about what they are learning, the content of the learning becomes important and changes the nature of the student's thinking. Creative thinking is an important aspect that affects the development of critical thinking skills. Creative thinking facilitates effective critical thinking and problem solving by encouraging flexible thinking and creative ideas or problem-solving approaches (Tan, Chye & Teo, 2009).

[DOR: 20.1001.1.26453460.2020.3.1.9.3]
[DOI: 10.52547/ijes.3.1.78]

In the present age, we are facing new technologies at every moment. When a baby is born, its cries are a sign of questioning, and this questioning needs to be answered. After the children go to their second home, ie preschool and elementary school, their questions and then their creativity make the beautiful world and finally their maturity flourish. Creative elementary students express their ideas and opinions without stress in class and receive different answers from the teacher and other classmates. This two-way relationship begins to form at the elementary level. The need for questioning by elementary students is one of their most basic needs, and the formation of critical thinking occurs from the beginning.

Media Literacy: Media literacy to analyze, reflect on print and electronic mass media, including films, their aesthetic components, institutional structures, economic contexts, and the ability to interact with the mediaو Refers to the production of audio-visual products and influence on media decision-makers "(Silverblatt & Finan, 2015). Media literacy is an approach that can be traditionally defined as new literacy or the expansion of literacy (Burnett & Merchant, 2015).

Creativity: Throughout history, creativity has been considered a manifestation of mystical inspiration. It is only in modern times that creativity has become the subject of methodological study (Jonas, 2016). Today, there is a scientific consensus that creativity involves the production of new, different, innovative, yet useful, relevant, and appropriate things to do (Corzza, 2016). Most current researchers agree that creative potential can be realized and maximized (Thornhill-Miller & Dupont, 2016). In addition, it is now widely accepted that creativity can be enhanced specifically through education through most creative education programs that focus on divergent thinking (Caroff & Lubart, 2012). In the context of creative cognition, the ability to be creative is part of normative cognitive function, not an ordinary talent that is only available to a few (Prabhakaran & Gray, 2014). The ability to manipulate objects in the human mind, as well as the ability to create and use new mental categories, is two examples of abilities that are pervasive among people and support the creative cognition approach. The Creative Cognition Framework emphasizes the dependence of creative thinking on fundamental cognitive processes such as memory and executive control (Sowden, 2014). According to this approach, creativity is shaped by education and age (Karbach & Schubert, 2013) and individual differences in creativity can be understood in terms of changes in the efficiency of extraordinary cognitive processes (Wertz & Jung, 2013).

Critical Thinking: The literature on critical thinking is rooted in the two major academic disciplines of philosophy and psychology (Agarwal, 2019). He also mentioned the third field of critical thinking in the field of education. These separate disciplines have developed different approaches to defining critical thinking that reflect their concerns. The writings of Socrates, Plato, Aristotle, and more recently Matthew Lippmann and Richard Powell show a philosophical approach. This approach focuses on hypothetical critical thinking and is the number of traits and characteristics of a person, not the behaviors or actions that a critical thinker can perform (Paul & Elder, 2019). He pointed out that this school of thought approaches critical thinking as an ideal and focuses on what people are best able to do. Accordingly, Paul discusses critical thinking in the context of the "perfections of thought" because one who is curious is open-minded, flexible, fair-minded, and inclined to be aware and diverse. He expresses views and is willing to both suspend arbitration and consider other perspectives (Lai, 2011). Those who follow the philosophical tradition also emphasize the characteristics or criteria of thought. For example, Bailin (2002) defines critical thinking as thinking for a particular quality - essentially good thinking that has certain criteria of adequacy and accuracy. In addition, the philosophical approach has traditionally focused on the use of formal laws of logic (Sternberg, 2019). One of the limitations of this approach to defining critical thinking is that it does not always correspond to reality (Sternberg, 2019). This approach, with its emphasis on ideal critical thinking and what people are capable of doing, may be less used in the discussion of how people think.

The psychological cognitive approach contradicts the philosophical view in two ways. First, cognitive psychologists, especially those immersed in the tradition of behaviorism and the pattern of empirical research, focus on how people think in real situations, not what is possible or ideal (Sternberg, 2019).

[DOR: 20.1001.1.26453460.2020.3.1.9.3]
[DOI: 10.52547/ijes.3.1.78]

Second, instead of defining critical thinking by referring to the characteristics of ideal critical thinking or counting the criteria or standards of "good" thinking, those working in cognitive psychology tend to associate critical thinking with the kinds of actions or behaviors that thinkers have. Critics can do, define. Typically, this approach to defining critical thinking involves a list of skills or practices performed by critical thinkers (Lewis and Smith, 1993). Philosophers have often criticized the latter aspect of the psychological cognitive approach as reductionist - reducing the complexity of knowledge and skills and turning it into a set of discrete steps or procedures (Sternberg, 2019). For example, Bailin (2002) argues that it is a misconception to think of critical thinking as a series of discrete steps or skills, and that this misconception stems from the need for behaviorists to define structures in ways that are directly observable. It becomes. According to this argument, because the actual process of thinking is uncontrollable, cognitive psychologists tend to focus on products of such obvious behaviors or skills (eg, analysis, interpretation, good questioning). Other philosophers have warned about the confusion of the activity of critical thinking by considering each of its components, arguing that critical thinking is more than the sum of all its components (Van Gelder, 2005). In fact, several proponents of the philosophical tradition have suggested that it is easy to go through the "stages" of critical thinking without engaging in critical thinking (Bailin, 2002).

Problem-solving skills: Problem-solving is usually accepted as a developed thinking skill and involves various thought processes (Codina, 2015) and finding solutions or decisions for personal use of prior knowledge (Coban, 2014).). Problem solving has four stages: understanding the problem, creating a plan, conducting a plan and experiment, and going back (Sukoriyanto, 2016). Problem solving can occur at any stage of a person's life. When people in school face the problem-solving process, they face many problems. According to the NCTM (National Council of Mathematics Teachers), problem-solving skills are among the most important skills that use the highest level of mathematical knowledge and skills (Cai and Lester, 2010). The problem-solving process is described as a complex process that requires many skills together. The elements of this process understand the problem, selecting the necessary information from the given options, converting the obtained information into mathematical symbols and finding the solution after performing the necessary operations. These elements do not follow a linear path (Olkun and Toluk, 2004).

Chen (2018) stated in a study entitled "Determining the norm of Singaporean students' media media literacy: policy and educational implications" that Singapore is moving to a rapidly changing media environment with the growing influence of news media. The educational department has responded. An extensive study was conducted in Singaporean schools to determine the media literacy norm of Singaporean students. It was based on a conceptual framework of news media literacy. A total of 4,577 students from 10 to 15 years old from 52 schools participated in the study. That is, one-seventh of Singapore schools participated in the survey. These findings provide valuable insights into theorizing media and news media literacy, as well as for policymakers and educators in countries with similar news media ecologies. The implications of this study show that gender equality can be achieved in teaching news media literature. They also explore new areas of research by looking at news media literacy in terms of second language learning.

Doron (2017) in a study entitled "Study of creativity in primary school children through the implementation of short-term educational programs based on visual media" stated that creativity is now recognized as an ability that can be developed and improved. Basic research in creative studies has shown that creative thinking abilities can be enhanced through intervention and education. In a previous study, they reported the effectiveness of a short-term, innovative intervention program to enhance creative thinking, focusing on divergent thinking skills (Doron, 2016). The study included 286 school children between the ages of 10 and 14 who participated in a 10-week training program. The intervention included a set of assignments inspired by theoretical and practical concepts, including the use of media in education. They allowed creativity to be taught to broadcast children's daily lives using program elements in their spare time while watching television or other media to enjoy them. The aim of this study was to evaluate the

[DOR: 20.1001.1.26453460.2020.3.1.9.3]
[DOI: 10.52547/ijes.3.1.78]

effectiveness of the program in increasing divergent thinking skills according to the Tactical Test of Creativity. The results showed that the children who participated in the program activities were significantly higher in the creativity tests at the end of the program and showed that creative thinking and divergent thinking abilities in particular can be increased through the type of intervention proposed in this study.

Torabi, and Ferdowsipour (2015) in a study entitled "Study of the effectiveness of media literacy training on the development of students' creative thinking" has investigated the effect of media literacy training on the creative thinking of first grade high school students. The type of research is quasi-experimental with pre-test post-test design with control group. The statistical population of the present study consisted of all first grade high school students in Tehran. From this statistical population was selected by random sampling method of clusters of region two, and from the selected region were selected two classes of first grade of high school, one of which was randomly selected as the experimental group and the other class as the control group. In this study, the Abedi Creativity Questionnaire was used to assess students' creativity. The research was conducted in such a way that first the pre-test of creativity was performed for both groups (experimental and control), then the 8-session media literacy training plan was implemented for the experimental group, but no training was applied for the control group; Immediately after completing the media literacy training for the experimental group, a post-test of creative thinking was performed for both groups and finally the findings were analyzed using the covariance test. The results showed that media literacy training has a positive and significant effect on creative thinking and can promote the development of this essential skill in students.

2. Methodology

According to the classification, in terms of the purpose of this research, an applied research is descriptive. The process of conducting the present study is to select the statistical population and sampling them, determining the field method for data collection and setting up a questionnaire as a data collection tool; enter the spatial territory and collect the required data; finally, organizing and analyzing the collected data and analyzing them. The statistical population of the present study was the sixth grade students of non-profit schools in Tehran, whose number was approximately equal to 9058 people, of whom 369 people were selected as a sample based on Cochran's formula and according to the class sampling rule. 206 girls (from a population of 5056 people) and 163 boys (from a population of 4002 people) are selected. Data collection tool was a standard questionnaire. The Simon (2017) questionnaire was used to measure media literacy, the Harris (2016) questionnaire was used to measure creativity, the Sarigoz (2012) questionnaire was used to measure critical thinking, and the Sirait (2017) questionnaire was used to measure problem-solving skills. Since in this study, sixth grade students are considered, items from the mentioned questionnaires are considered that are tangible and understandable for students. Finally, 9 items were used to measure media literacy, 5 items were used to measure creativity, 4 items were used to measure critical thinking, and 4 items were used to measure problem-solving skills. Structural validity (confirmatory factor analysis) was used to assess the validity of the questionnaire and Cronbach's alpha and retest reliability were used to assess the reliability of the questionnaire. To measure the reliability using Cronbach's alpha, a sample of 30 people was selected and after collecting a questionnaire from the prototype group, Cronbach's alpha was calculated using SPSS software and the alpha value was 0.801. If the value was higher than 0.7, the reliability of the questionnaire based on this technique was confirmed. To measure the reliability of the retest in two consecutive periods, a questionnaire sample was collected from 30 people and using correlation test, the correlation between the variables in the two periods was examined and due to the fact that the coefficient was higher than 0.7, the reliability was confirmed. Data analysis method is structural equation technique and data analysis tool is LISREL and SPSS software. Considering that the sample includes two groups of girls and boys, the model is fitted separately for the two groups and finally the difference in results between the two groups is evaluated.

[DOR: 20.1001.1.26453460.2020.3.1.9.3]
[DOI: 10.52547/ijes.3.1.78]

3. Findings

Checking the normality of variables: Because in the present study, structural modeling was used and the structural model is based on the assumption that the data are normal, so the normality test was performed first. The hypothesis of normality of the data at a significance level of 5% was further tested by the Kolmogorov-Smirnov technique.

Table1. Investigation of the normality of research variables

Variable	Number of observations	Test statistics	meaningful
Media literacy	369	.031	.978[e]
Creativity	369	.041	.790[e]
Critical Thinking	369	.030	.979[e]
Problem-solving skills	369	.056	.640[e]

Based on the results, in all cases, a significant value greater than 0.05 was obtained, Therefore, there is no reason to reject the null hypothesis, ie the distribution data of each dimension are normal dimensions, and therefore LISREL software should be used. Confirmatory factor analysis: In this study, a questionnaire was used to measure research variables. To test research hypotheses based on this scale, the accuracy of the scale used must first be confirmed. Therefore, confirmatory factor analysis has been used to measure the relationships of hidden variables with their measurement items.

Before performing factor analysis, the ability of the data to perform confirmatory factor analysis should be checked. For this purpose, the adequacy of the number of observations and the appropriateness of the correlation of the observations are checked. The Kaiser-Mir-Ulkin (KMO) tests of sample adequacy and the Bartlett spherical test are commonly used to determine whether a sample meets the appropriate requirements for factor analysis. In this study, the adequacy of the sample is investigated using the Kaiser-Meyer-Ulkin index and if the value of the statistic is more than 0.7, it is determined that the number of samples is sufficient according to the number of model parameters. Bartlett test is used to ensure the appropriateness of the correlation of the observations and if the significance of the test is less than 0.05, the correlation of the observations is appropriate. the results showed that KMO and Bartlett index are in the standard distance and therefore the default factor analysis is established. The results of factor analysis of the research scale are presented below. To assess the structural model of the research, 4 main factors (hidden variable) and 37 questions (visible variable) were used. Each of these variables is displayed with an index up in the figure.

[DOR: 20.1001.1.26453460.2020.3.1.9.3]
[DOI: 10.52547/ijes.3.1.78]

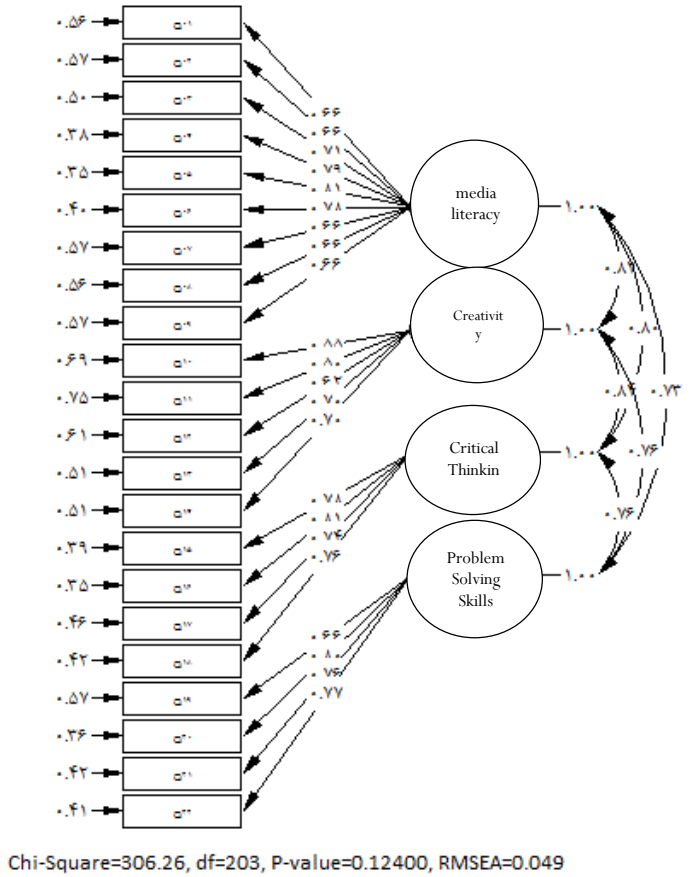

Figure1. Standard factor load (girls group)

The strength of the relationship between the factor (hidden variable) and the observable variable is indicated by the factor load. In the figure above, the hidden variables are shown with an ellipse and the explicit variables (items) are shown with a rectangle. Items 1 to 9 explain media literacy, items 10 to 14 explain creativity, items 15 to 18 explain critical thinking, and items 19 to 22 explain problem-solving skills.

The model in the case of t-coefficients or the case of significance shows the values of t-statistics that are used to judge the significance of relationships. Thus, if the values of t-statistic are between 1.96 and -1.96, the coefficients are not significant and lead to the rejection of the research hypotheses and are significant if they are outside this range. The observation factor load in all cases is greater than 0.5, which indicates that the correlation between the hidden variables (dimensions of each of the main structures) with the observable variables is acceptable. Based on the results of the measurement indicators of each of the scales used at the 5% confidence level, the value of the t-value statistic is greater than 1.96, which shows that the observed correlations are significant. The structural model is evaluated based on five criteria: analogy probability ratio (chi-square), fit-fit index (GFI), norm-fit index (NFI), comparison-fit index (CFI), and root mean square estimation error (RMSEA). The RMSEA index value should be less than 0.05. The p-value index indicates the probability that the RMSEA index is less than 0.05 and greater than 0.05 indicates that the assumption that the RMSEA index is less than 0.05 is accepted (Jurskag and Sorbum, 1996; Byrne, 2010). The results showed that the p-value was more than 0.05 and the RMSEA index was less than 0.05. GFI, NFI and CFI indices are in the desired range, which indicates the proper fit of the model.

[DOR: 20.1001.1.26453460.2020.3.1.9.3]
[DOI: 10.52547/ijes.3.1.78]

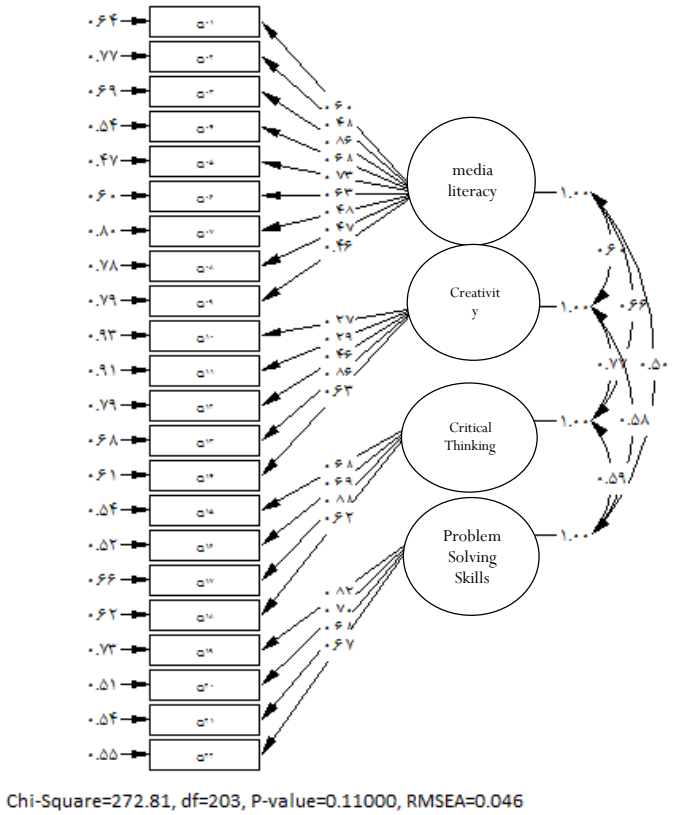

Figure2. Standard factor load (boys group)

The strength of the relationship between the factor (hidden variable) and the observable variable is indicated by the factor load. In the figure above, the hidden variables are shown with an ellipse and the explicit variables (items) are shown with a rectangle. Items 1 to 9 explain media literacy, items 10 to 14 explain creativity, items 15 to 18 explain critical thinking, and items 19 to 22 explain problem-solving skills.

Path analysis: After confirming the factor structure of research structures, path analysis has been used to examine the relationships between variables. In this model, the relationships between research variables can be seen in the output of Lisrel software.

[DOR: 20.1001.1.26453460.2020.3.1.9.3]
[DOI: 10.52547/ijes.3.1.78]

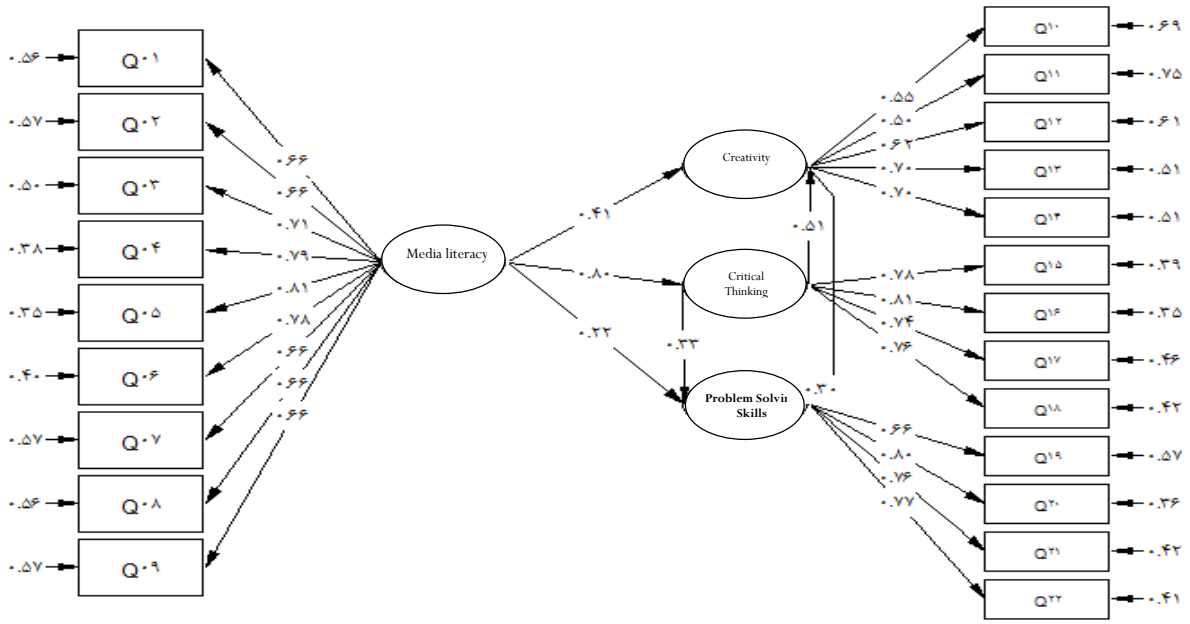

Figure3. Path coefficients (girls group)

The value of the path coefficient from the independent to the dependent variable shows the effect of the independent variable on the dependent. In other words, this coefficient indicates how much the dependent variable changes per unit change in the value of the independent variable.

Table3. Checking the correctness of the hypotheses (girls group)

Hypothesis	Path coefficient	Amara T	Subare statistics	Result
Hypothesis 1: Media literacy affects creativity.	0/41	4/60	----	Confirmation
Hypothesis 2: Media literacy affects critical thinking.	0/80	14/15	----	Confirmation
Hypothesis 3: Media literacy affects problem solving skills.	0/22	2/24	----	Confirmation
Hypothesis 4: Critical thinking has a mediating role in the impact of media literacy on creativity.	0/41	----	5/03	Confirmation
Hypothesis 5: Critical thinking has a mediating role in the effect of media literacy on problem solving skills.	0/26	----	2/84	Confirmation
Hypothesis 6: Creativity has a mediating role in the effect of media literacy on problem solving skills.	0/12	----	1/98	Confirmation

In the following, it is evaluated whether the difference between the coefficients in the two groups is significant or not.

Table4. Investigating the differences between the results of the hypotheses in the two groups of girls and boys

Hypothesis	Girls group		Boys group		Statistics t difference	Result
	Path coefficient	Amara T / Sobel	Path coefficient	Amara T / Sobel		
Hypothesis 1: Media literacy affects creativity.	0/41	4/60	0/61	4/26	1/67	No differences
Hypothesis 2: Media literacy affects critical thinking.	0/80	14/15	0/71	10/24	1/42	No differences
Hypothesis 3: Media literacy affects problem solving skills.	0/22	2/24	0/35	2/42	1/05	No differences

[DOR: 20.1001.1.26453460.2020.3.1.9.3]
[DOI: 10.52547/ijes.3.1.78]

Hypothesis 4: Critical thinking has a mediating role in the impact of media literacy on creativity.	0/41	5/03	0/70	5/23	2/61	No differences
Hypothesis 5: Critical thinking has a mediating role in the effect of media literacy on problem solving skills.	0/26	2/84	0/28	4/30	0/25	No differences
Hypothesis 6: Creativity has a mediating role in the effect of media literacy on problem solving skills.	0/12	1/98	0/38	3/48	2/94	No differences

4. Discussion

Given the importance of media and its management, what was addressed in this study was the study of media literacy on the skills of creativity, critical thinking and problem solving directly and indirectly. For this purpose, the relationships between the variables in the two groups of girls and boys in the sixth grade of elementary schools in Tehran were tested. The results showed that the effect of media literacy on creativity, with an increase of one unit of media literacy, creativity of boys increases by 0.41 units and girls by 0.61 units. In the effect of media literacy on critical thinking, with the increase of one unit of media literacy, the critical thinking of boys increases by 0.80 units and girls by 0.71 units, In the effect of media literacy on problem solving skills, with the increase of one unit of media literacy, problem solving skills of boys increase by 0.22 units and girls by 0.35 units. In examining the mediating role of critical thinking in the relationship between media literacy and creativity, the coefficient value is 0.41 in boys and 0.70 in girls. Therefore, by increasing one unit of critical thinking, the effect of media literacy on creativity improves by 0.41 units in the boys group and 0.70 units in the girls group. In examining the mediating role of critical thinking in the relationship between media literacy and problem solving, the coefficient value is 0.26 for boys and 0.28 for girls. Therefore, with the increase of one unit of critical thinking, the effect of media literacy on problem solving improves by 0.26 units in boys and 0.28 units in girls. In examining the mediating role of creativity in the relationship between media literacy and problem solving, the coefficient value is 0.12 in boys and 0.38 in girls. Therefore, by increasing one unit of creativity, the effect of media literacy on problem solving improves by 0.12 units in the boys group and by 0.38 units in the girls group.

In examining the differences in relationships between boys and girls, the results showed that there is a significant difference between the mediating role of critical thinking in the effect of media literacy on creativity and the importance of this role in boys is more than girls. Also, there is a significant difference between the mediating role of creativity in the effect of media literacy on problem solving skills and the importance of this role is more in boys than girls. Therefore, according to the results, students' media literacy can improve problem solving skills, creativity and critical thinking. In fact, understanding the information received from the educational and cultural programs of the media leads to students being able to analyze these materials and correctly understand the positive and negative materials and challenge them. Kill and be able to use their creative thinking and ultimately provide appropriate solutions to the problems they are dealing with. Media literacy enhances critical thinking more than other skills and, therefore, improves students' challenging spirit and their ability to distinguish right from wrong, since critical thinking plays a mediating role in the relationship between media literacy and problem solving skills and creativity, improving critical thinking can improve the effect of media literacy on problem solving skills.

[DOR: 20.1001.1.26453460.2020.3.1.9.3]
[DOI: 10.52547/ijes.3.1.78]

References

Agarwal P K. (2019). Retrieval practice & Bloom's taxonomy: Do students need fact knowledge before higher order learning? Journal of Educational Psychology, 111(2): 189.

Altintas E, Ozdemir A S. (2012). The effect of teaching with the mathematics activity based on purdue model on critical thinking skills and mathematics problem solving attitudes of gifted and non-gifted students. Procedia-Social and Behavioral Sciences, 46: 853-857.

Badiee N. (2005). Editorials. Mass Media, 17: 5-6.

Bailin S. (2002). Critical thinking and science education. Science & Education, 11(4): 361-375.

Bossavit B, Parsons S. (2017). From start to finish: teenagers on the autism spectrum developing their own collaborative game. Journal of Enabling Technologies.

Burnett C, Merchant G. (2015). The challenge of 21st-century literacies. Journal of Adolescent & Adult Literacy, 59(3): 271-274.

Cai J, Lester F. (2010). Why is teaching with problem solving important to student learning. National council of teachers of mathematics, 13(12): 1-6.

Căprioară, D. (2015). Problem solving-purpose and means of learning mathematics in school. Procedia-Social and Behavioral Sciences, 191: 1859-1864.

Caroff X, Lubart T. (2012). Multidimensional approach to detecting creative potential in managers. Creativity Research Journal, 24(1): 13-20.

Chang Y, Li B D, Chen H C, Chiu F C. (2015). Investigating the synergy of critical thinking and creative thinking in the course of integrated activity in Taiwan. Educational Psychology, 35(3): 341-360.

Chen D T, Lin T B, Li J Y, Lee L. (2018). Establishing the norm of new media literacy of Singaporean students: Implications to policy and pedagogy. Computers & Education, 124: 1-13.

Christ W G, De Abreu B S. (Eds.). (2020). Media Literacy in a Disruptive Media Environment. Routledge.

Çoban A. (2014). Probleme dayalı öğrenme. Behçet Oral (Ed.). Öğrenme öğretme kuram ve yaklaşımları (3.Baskı) içinde (s. 479-508). Ankara: Pegem Akademi Yayıncılık.

Codina A, Cañadas M C, & Castro E. (2015). Mathematical problem solving through sequential process analysis. Electronic Journal of Research in Educational Psychology, 13(1): 73-76.

Cooke A, Kemeny T. (2017). Cities, immigrant diversity, and complex problem solving. Research Policy, 46(6): 1175-1185.

Corazza G E. (2016). Potential originality and effectiveness: The dynamic definition of creativity. Creativity research journal, 28(3): 258-267.

Doron E. (2017). Fostering creativity in school aged children through perspective taking and visual media based short term intervention program. Thinking skills and creativity, 23: 150-160.

Fontanari J F. (2017). Awareness improves problem-solving performance. Cognitive Systems Research, 45: 52-58.

Ghasemi T. (2006). Media literacy: New approach to controling. Media, 17, 85-106. Harris, A. (2016). Creativity, Education and the Arts. London: Springer.

Hobbs R, Jensen A. (2009). The past, present, and future of media literacy education. Journal of Media Literacy Education, 1: 1-11.

James D, Hartzler M L, Chen A M. (2016). Assessment of critical thinking skills progression in a pre-pharmacy curriculum. Currents in Pharmacy Teaching and Learning, 8(6): 767-773.

Jonas S. (2016). Ineffability and its metaphysics: The unspeakable in art, religion, and philosophy.

Karbach J, Schubert T. (2013). Training-induced cognitive and neural plasticity. Frontiers in Human Neuroscience.

Lai E R. (2011). Critical thinking: A literature review. Pearson's Research Reports, 6: 40-41.

Lindner C. (2019). 1.4 Boredom and Creativity in the Era of Accelerated Living. Boredom, Shanzhai, and Digitisation in the Time of Creative China, 110.

McGowan R T, Rehn T, Norling Y, Keeling L J. (2014). Positive affect and learning: exploring the "Eureka Effect" in dogs. Animal cognition, 17(3): 577-587.

Nasim T, Ferdowsipour A. (2017). Evaluation of the effectiveness of media literacy training on the development of students' creative thinking, the first national conference of modern research in Iran and the world in psychology and educational sciences, law and social sciences, Shiraz, Shushtar University of Applied Sciences

Olkun S, Uçar Z T. (2004). ølköretimde Etkinlik Temelli Matematik Öretimi.

[DOR: 20.1001.1.26453460.2020.3.1.9.3]

[DOI: 10.52547/ijes.3.1.78]

Pau R, Elder L. (2019). The miniature guide to critical thinking concepts and tools. Rowman & Littlefield.

Prabhakaran R, Green A E, Gray J R. (2014). Thin slices of creativity: Using single-word utterances to assess creative cognition. Behavior research methods, 46(3): 641-659.

Rodzalan S A, Saat M M. (2015). The Perception of Critical Thinking and Problem Solving Skill among Malaysian Undergraduate Students. Procedia-Social and Behavioral Sciences, 172: 725-732.

Sarigoz O. (2012). Assessment of the high school students' critical thinking skills. Procedia-Social and Behavioral Sciences, 46: 5315-5319.

Shokrkhah Y. (2001). Audiences need to Media Literacy. Research and Evaluation Journal. th year, 26.

Silverblatt A, Ferry J, Finan B. (2015). Approaches to Media Literacy: A Handbook: A Handbook. Routledge.

Simões R B, Amaral I, Santos S. (2020). Media education and digital inclusion: Tackling the social exlusion of disadvantaged grous in Europe. In Proceedings of INTED 2020 Conference 2nd-4th March 2020 (pp. 6527-6534). IATED.

Simon M, Meeus W, T'Sas J. (2017). Measuring Media Literacy for Media Education: Development of a Questionnaire for Teachers' Competencies. Journal of Media Literacy Education, 9(1): 99-115.

Sirait J, Sutrisno L, Balta N, Mason A. (2017). The Development Of Questionnaire To Investigate Students Attitudes And Approaches In Physics Problem Solving. Jurnal Pendidikan Fisika Indonesia, 13(2): 79-87.

Sowden P T, Pringle A, Gabora L. (2014). The shifting sands of creative thinking: connections to dual-process theory. Thinking & Reasoning, 21: 40-60.

Sternberg R J. (2019). Evaluation of Creativity Is Always Local. In The Palgrave Handbook of Social Creativity Research (pp. 393-405). Palgrave Macmillan, Cham.

Sukoriyanto S, Nusantara T, Subanji S, Chandra T D. (2016). Students' Errors in Solving the Permutation and Combination Problems Based on Problem Solving Steps of Polya. International Education Studies, 9(2): 11-16.

Tan O S, Chye S, Teo C T. (2009). Problem-based Learning and Creativity: A Review of the Literature. IN Tan, O. S. (ED.). Problem-Based Learning and Creativity Singapore: Cengage Learning Asia Pte Ltd. 15-38.

Thornhill-Miller B, Dupont J M. (2016). Virtual reality and the enhancement of creativity and innovation: Under recognized potential among converging technologies? Journal of Cognitive Education and Psychology, 15(1): 102-121.

Van Gelder T. (2005). Teaching critical thinking: Some lessons from cognitive science. College Teaching, 53(1): 41-48.

Wertz C J, Chohan M O, Ramey S J, Flore R A, Jung R E. (2020). White matter correlates of creative cognition in a normal cohort. NeuroImage, 208, 116293.

[DOR: 20.1001.1.26453460.2020.3.1.9.3]

[DOI: 10.52547/ijes.3.1.78]