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The Effects of Different Applications on Creativity Regarding Academic Achievement: A Meta-Analysis

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Abstract

In this study, through a meta-analysis of 20 studies, it is aimed to compare the effectiveness of various forms of learning methods including creativity based learning, problem based learning, and differentiated instruction on creativity in terms of the academic achievement of students and to find out other study characteristics, related to the effectiveness of creativity. Studies including the pretest-posttest control group model and collected from national and international arena between the years 2000 to 2015 were chosen. In this context, 20 studies that met inclusion criteria were analyzed under three themes: creativity based learning, problem based learning, and differentiated instruction by using Comprehensive Meta- Analysis and the MetaWin statistical program. In addition, other studies having effectiveness on creativity were categorized as "method" and "approach" and their effect sizes were calculated separately. The effect size values of academic achievement scores in each theme were found to be respectively 0.850, 1.560, and 0.729 which were significant and at a large level in the first two themes; at a medium level in the third theme according to the classification of Thalheimer and Cook. The results indicated that different applications had positive effects on academic achievement.

Keywords: meta-analysis, creative-based learning, problem-based learning, differentiated instruction, academic achievement

1. Introduction

The subject of creativity as a divine, mystical, or spiritual phenomenon has fascinated human beings throughout history. However, creativity is a relatively new field of scientific research. Primary researches have been conducted about creativity by Guilford, the chairman of the American Psychology Association, in1950's (Demirci, 2007). Until this time, creativity had been a "neglected area" of scientific interest (Petrowski, 2000, p. 305). According to Petrowski (2000), psychology's relative disinterest in creativity is because of being perceived as spiritual, rather than scientific, subject matter. Although the neglect of this subject by psychologists, Guilford envisaged scientific research on creativity and offered several explanations for its apparent absence in today's literature (Gardner, 1993).

Although creativity is generally regarded as an innate, natural ability or talent, it withstands a "universally acceptable definition" (Jones, 1972, p. 5). As Fishkin (1999) explains, creativity as a "fascinating combination of phenomena" cannot be captured within a "single definition" (p. 5). Most generally accepted definitions of creativity consist of two major criteria: novelty and appropriateness (Atkinson, 2000; Mayer, 1999; Starko, 2005). In line with these criteria, Dineen, Samuel, and Livesey (2005) suggested creativity as "a process producing an outcome that is novel/original and appropriate/valuable" (p. 155). Similarly, according to Kaufman & Sternberg (2010), creative ideas must be high quality and represent something different, new, or innovative. The concept of creativity first appeared in the English language by referring to a person, process, or product considered to be new and useful, imaginative and productive (Bleakley, 2004). In addition to person, product, and process categories, the fourth category called as press which refers to the relationship between human beings and their socio-cultural environment is still commonly used to frame new concepts of creativity (Richards, 1999; Runco, 2004).

Since creativity has been perceived as an essential criterion in education, it can be taught in the classroom. Treffinger (1985) and Feldhusen and Treffinger (1986) argued that a feasible objective for education is enhancing the creative thinking and problem solving of students. According to Cronin (1989), creative thinking skills are no different than any

other skill and can be learned and practiced. In order to develop creative skills, one must be provided with practice, motivation, involvement, interaction with teachers and other students, and structure (Torrance, 1986). Since the concept of problem-solving is closely associated with both creativity and innovation (Gordon, 2011; Nickerson, 1999; Saiz & Rivas, 2011), in a creative process, "the thinker finds a problem or issue worthy of being addressed, generates ideas for solving it, and evaluates those ideas" (Starko, 2005, p. 192). In other words, creative patterns include acts of comparing, contrasting, visualizing, interpreting, and problem solving (Scholl, 2005). For some researchers, such as Newall, Shaw, & Simon (1962), creative thinking is a subset or "special class" (p. 66) of problem-solving while others argue that creative thinking and problem solving are one in the same (Feldhusen & Teffinger, 1986 Guilford, 1964). As overlapping concepts, in problem solving stage "students need to think creatively when a definitive answer for a problem does not exist; when prior experience is not necessarily helpful; and when rules for solving the problem are not available" (Antonietti,1997, p. 75). Fundamental elements of creative and problem solving activities are also needed to encourage creativity in differentiated instruction which promotes multiple options for acquiring, processing, and expressing knowledge, so that all students can learn effectively according to their needs (Tomlinson, 1995); think critically and creatively about what they learned and extend their understanding (Tomlinson & Edison, 2003). Therefore, by emphasizing creativity, student thinking can be shifted beyond memorization towards higher-level thinking such as analyzing, synthesizing, and evaluating (Kiener & Ahuna, 2011) in all instruction methods.

The present meta-analytic study focuses on the comparison of the effectiveness of various forms of learning methods including creativity-based learning (CBL), problem-based learning (PBL), and differentiated instruction (DI) on creativity in terms of the achievement of students, and therefore this study aims to synthesize recent research to signify in which applications creativity is more correlated with academic achievement. To fulfill the purpose of this study, two key research questions were addressed:

1. To what extent are the different applications including CBL, PBL and DI effective on creativity considering academic achievement of students?
2. To what extent are other studies categorized as "method" and "approach" effective on creativity considering academic achievement of students?

2. Meta-analysis Methodology

The current study employed meta-analysis method which is a quantitative and formal study design used to assess previous research studies systematically and to derive conclusions about that body of research (Haidich, 2010). While reaching a general conclusion, the results of different studies concerning the same subject but collected independently from each other are put together and re-analyzed to specify the level of students (Glass, 1976).

2.1 Literature Search Procedure

A comprehensive literature search of studies written between 2000 and 2015 was conducted by using national and international educational databases [Proquest Dissertations & Theses Global, Google Scholar, the Higher Education Council National Thesis and Dissertation Center, Ebscohost-Eric (National Academic Network and Information Center)]. The keywords used to conduct the search included: "creative-based learning", "problem-based learning", "differentiated instruction", "creativity" both English and Turkish as the key learning methods which were combined with "creativity" and "academic achievement". This procedure resulted in the identification of 20 studies. Of this total, 19 were generated from theses and 1 was from articles.

2.2 Introducing a Set of Inclusion Criteria

In line with the following inclusion criteria which were established for selecting studies, 20 of these 330 studies met the criteria and were included in the analysis.

1. Only studies that used experimental and control groups (pretest-posttest control group model) were included (i.e., no single-subject studies were included). The focus of the studies was on comparing the academic achievement of a group of students who were instructed using one of the various forms of learning methods including CBL, PBL, and DI to their counterparts who were instructed using traditional lecture-based instruction in terms of promoting creativity.
2. Studies must have reported sample sizes, means and standard deviations, or t-test values, F-test values, or p-values, so that effect sizes could be calculated (Cooper & Hedges, 1994).
3. Studies could have been performed in any country, but the report had to be available in English or Turkish.
4. Studies had to have taken place from 2000 to 2015.

2.3 Coding of Studies

To identify and explain each study in detail, studies needed to be coded in three phases. In the 1st phase of coding called "study identity" which was related to describing the studies, the study features were categorized as name of study, year of publication, types of publication (published or unpublished), and author information. Some information related to

course type, grade levels, and the duration of implementation (weeks) were presented in the 2nd phase of coding. Sample sizes, means and standard deviation values used in the meta- analysis calculation were given in the 3rd phase of coding called "study data".

2.4 Identifying Variables

Meta-analysis has also dependent and independent variables as in any experimental and correlational studies.

2.4.1 Independent Variable (s)

The independent variables are study characteristics in a meta-analysis. These study characteristics which were coded in the coding form of this study were related to publication histories (publication type, publication year, author information), grade levels, duration of implementation and study data (sample sizes, mean and standard deviation values).

2.4.2 Dependent Variable (s)

The dependent variable was academic achievement of students for this meta-analysis. In order to yield effect sizes for the dependent variable of academic achievement, various experimental settings and tasks were used in the studies.

2.5 Statistical Analysis

The data were analyzed statistically using the Comprehensive Meta-Analysis (CMA) statistical program and the MetaWin program. The study effect meta-analysis method which includes calculations of the differences between the mean scores of experimental and control groups (Hunter, & Schmidt, 1990: cited in Acar, 2011) was applied to analyze the data.

Effect size is a way of quantifying the size of difference between the experimental and control groups (Coe, 2002). In the present study, Hedges'd formula was used for the estimation of effect size (Hedges & Olkin, 1985), defined as the difference between experimental and comparison groups means divided by the standard deviation (Cooper & Hedges, 1994). In addition, in order to detect the total heterogeneity of a sample, a Q statistic which is distributed as a chi-square distribution with k-1 degrees of freedom where k is the number of effect sizes (Hedges & Olkin, 1985) was used. The k-1 degree of freedom chi-square ($\chi 2$) heterogeneity test was defined and suggested as the most common test approach to determine heterogeneity by Cochran (Higgins et al. 2003). In order to determine the effect sizes, fixed effect models (FEM) and random effects models (REM) were used. While under the fixed-effect model, there is a common effect size that underlies all the studies in the analysis, under the random-effects model, it is possible that all studies share a common effect size, but it is also possible that the effect size varies from study to study (Borenstein, et.al. 2009). Finally, all the statistical data included in the analysis were converted into a common effect size and interpreted using Thalheimer and Cook (2002) guidelines which suggest that -0,15≤ is a negligible effect size, 0,15≤ is a small effect size, 0,40≤is a medium effect size, 0,75≤is a large effect size, 1,10≤ is a very large effect size, and 1,45≤ is a huge effect size.Furthermore, in order to obtain a certain level of reliability, the research outcomes were calculated by another reader having a Ph.D. and serving as a coder. In order to validate inter-coder reliability of the studies which were involved in the current research, Miles and Huberman's (1994) formula [agreement / (agreement + disagreement) x 100] was carried out and it was calculated as 100%. The result indicated that the reliability between the researchers and coder was very high.

3. Results

The number of studies meeting the inclusion criteria of the current study in the synthesis was 20. Of 20 studies 1 article, 9 PhD theses, 10 master's theses were retained in the analysis with a total sample size of 1089 students. While the experimental group consisted of 549, the control group consisted of 540 students.

To find out the answer of the research question concerning to what extent the different applications including CBL, PBL, and DI are effective on creativity considering academic achievement of students, thematic-based meta-analysis was carried out. Therefore, the findings involving the comparison of the effects of different applications on creativity in terms of academic achievement scores of students to traditional students' scores were given. For this purpose, first, descriptive information belonging to meta-analysis was introduced and then, the effect sizes calculated separately for each subcategory were examined whether the changes occurred for each group or not. In other words, the distribution of homogeneous values, average effect sizes and confidence intervals of the studies included in the current study were calculated in two phases. In the first phase, the applications of CBL, PBL, and DI were thematized under the same title in order to be reached and analyzed more than one studies (Table1). In addition, fail-safe number ($F_{SN)}$ obtained according to Rosenthal's Method (R.'s M) was computed by MetaWin. In the second phase, the effect coefficients (*d*) of different applications which were conducted by different methods and approaches and therefore, thematized as "Method" and "Approach" were evaluated.

3.1 The Results of the Studies Included in Meta-Analysis in Terms of Academic Achievement Scores Which Were Grouped as Thematic-based

Titles of the studies in terms of the effect of creativity and examined in the scope of meta-analysis were thematized under three groups. The first theme was called "*CBL*". The findings of the general effect sizes regarding academic achievement of the studies which were related to the effect of this theme on creativity and included in meta-analysis were given in Table 1.

As shown in Table 1, according to the results of the studies in the theme of CBL, the standard error was 0.121 and the upper limit for 95% of the confidence interval was 1.088 while the lower limit was 0.612 and the effect size was 0.850. It can be stated that the effect size of the model is positive and significant. When the statistical significance was calculated according to the z-test, it was found as 6.876 (p>.05). As a result of the homogenous test, the Q statistical value was calculated as 6.876. In a 95% significance level from the chi-square table, the critical value of 9.488 and four degrees of freedom are accepted. Since the Q statistical homogeneity test value with four degrees of freedom did not exceed the critical value of $\chi 2$ distribution ($\chi 2_{(0,95)=}$9.488), the five studies included in the analysis were accepted FEM belonging to the homogeneity of distribution of effect sizes. In other words, the distribution of the effect size according to FEM was found to be homogenous.

Table 1. The Distribution of Homogeneous Values, Average Effect Sizes, Confidence Interval and Fail-Safe Number of the Studies Included in Meta-Analysis according to Effect Models

THEME	Model Type	n	Z	p	Q	ES	F_{SN}	95% *Confidence Interval*	
							R.'s M	*Lower limit*	*Upper Limit*
CBL	FEM	5	7.00	0.15145	6.876	0.850	87.0	0.612	1.088
PBL	FEM	5	10.106	0.000	36.793	1.315	210.1	1.060	1.570
	REM	5	3.859	0.30706	4.819	1.560		0.768	2.353
DI	FEM	3	2.762	0.000	92.781	0.897	3.4	0.260	1.534
	REM	3	0.326	0.34837	2.117	0.729		-3.659	5.117

The distribution of homogeneous value, average effect size and confidence intervals of the five studies which comprise the scores of the studies in *the theme of PBL* and included in meta-analysis were reported in Table 1. As a result of the analysis carried out with FEM concerning the scores of relevant studies, the standard error was 0.130 and the upper limit for 95% of the confidence interval was 1.570 while the lower limit was 1.060 and the effect size was 1.315. As a result of the homogenous test, the Q statistical value was calculated as 36.793. In a 95% significance level from the chi-square table, four degrees of freedom was found to be 9.488. Since the Q statistical value exceeded the critical value of $\chi 2$ distribution in 6.314 and four degrees of freedom ($\chi 2_{(0,95)}$=9.488), these five studies were not accepted FEM belonging to the homogeneity of distribution of effect sizes. In other words, it can be said that the distribution of the effect size is heterogeneous. The significance of the Q statistical value and the changes in the effect sizes would be expected from a sampling error (Lipsey & Wilson 2001). Therefore, as a result of the analysis carried out with REM, the standard error was 0.404 and the upper limit for 95% of the confidence interval was 2.353 while the lower limit was 0.768 and the effect size was 1.560. This indicates that the use of PBL has a more positive effect on students' academic achievement than traditional method. As a result of the z-test calculation for the purpose of statistical significance, the analysis can be said not to be statistically significant (z=3.859; p>.05).

The analysis of the studies in the theme of *DI* was carried out with FEM and presented in Table 1. Based on this calculation, the standard error was 0.325 and the upper limit for 95% of the confidence interval was 1.534 while the lower limit was 0.260 and the effect size was 0.897. As a result of the homogenous test, the Q statistical value was calculated as 92.781. In a 95% significance level from the chi-square table, two degrees of freedom was found to be 5.991. Therefore, it was observed that the Q statistical value exceeded the critical value of $\chi 2$ distribution in 92.781 and two degrees of freedom ($\chi 2_{(0,95)}$= 5.991). As a result of the analysis carried out with REM, the standard error was 0.729 and the upper limit for 95% of the confidence interval was 5.117 while the lower limit was -3.659 and the effect size was 0.729 and therefore, it can be interpreted that the use of DI has more positive effects on students' academic achievement than traditional method.

Another point considered in the study is to determine a possible publication bias that may occur in meta-analytic studies. Meta-analytic studies mostly include published studies and therefore, since the tendency for journals to only publish studies with statistically significant results, the most commonly assumption that the studies in the meta-analysis accumulate at a certain point generates a problem and may cause doubts about meta-analysis; at this point, in meta-analytic studies related to elimination of the relevant assumption and doubts, how many more studies be included in the analysis in order to reduce significant differences to zero is calculated. Rosenthal (1979) described the number of additional studies that are required as fail-safe number (N_{FS}). Fail-safe numbers of each theme taken place in this study were calculated by Metawin program. Fail-safe number of the studies in the theme of *CBL* was 87; in the theme of *PBL*

was 210.1; in the theme of *DI* was 3.4. In the current meta-analytic study, the effect of different applications on creativity was reduced to 0.01 by including more studies as much as fail-safe numbers specified for each theme. In this context, the fail-safe numbers of each theme were all relatively large in the current meta-analysis, suggesting that the results were reliable.

3.2 The Results of the Studies Included in Meta-analysis in Terms of Academic Achievement Scores Which Were Grouped as Methods and Approaches

Another aim of this meta-analytic study is to evaluate studies which were not only included in the analysis under the theme of *methods and approaches* but also they involved in different applications according to the effect coefficients given in Table 2. In the *theme of Method*, studies including the effects of methods such as Drama-based learning (Kaya, 2006), Discovery learning (Biber, 2006), Teaching with analogy (Saygılı, 2008), Cooperative learning (Uysal, 2009) on creativity were evaluated while in the *theme of Approach*, the effects of Project-based learning (Birinci, 2008) and Constructivist learning (Kaya, 2010) environments on creativity considering academic achievement were analyzed. As a result of the analysis, the effect coefficients of every study were evaluated according to the classification of Thalheimer and Cook (2002). However, the existence of outlier values among the average effect size values obtained from studies which were examined for meta-analysis would not enable meta-analysis to reach logical grounds (Hufcutt and Arthur, 1995; Hunter and Schmidt, 1990). In this context, a study the effect coefficient of which was evaluated as outlier value [Bacak, 2008 (d:15.7584)] was excluded from the data set.

Table 2. The Effect Sizes (ES), the Upper Limit Effect Size (ULES) and the Lower Limit Effect Size (LLES) of the Studies Included in Different Applications

Studies	ES	ULES	LLES	Studies	ES	ULES	LLES
Kaya $(2006)_{T16}$	1.279	0.747	1.811	Uysal $(2009)_{T32}$	0.297	-0.124	0.718
Biber $(2006)_{T17}$	0.737	0.137	1.338	Birinci $(2008)_{T22}$	-0.045	-0.476	0.387
Saygılı $(2008)_{T24}$	1.592	0.787	2.396	Kaya $(2010)_{T37}$	-1.948	-2.513	-1.384

Besides the effect sizes of studies including in different applications, the values regarding upper and lower limits of the effect sizes were reported in Table 2. The effect size of different applications for academic achievement in CBL environments can be interpreted as follows: The effect size of the study titled "the effect of using project-based learning in adaptation and development of materials on prospective teachers' critical thinking, creative thinking and scientific process skills" by Birinci (2008) was calculated as *insignificant* (ES=-0.045). The effect size of another study titled "the effects of the practices based on constructivist learning in teacher education on prospective teachers' problem solving, critical thinking and creative thinking dispositions" by Kaya (2010) was also found *insignificant* (ES=-1.948). However, while the effect size of the study titled "the effects of Cooperative learning method on the access, achievement, critical thinking and creativity skills of the elementary school fourth-grade students" by Uysal (2009) was *low* (ES=0.297), the effect size of another study titled "the effects of the method of discovery learning on primary education grade II mathematics students' creativity" by Biber (2006) was *medium* (ES=0.737). In addition, the study titled "the contribution of drama-based education to creativity process in the third grade elementary students' visual arts courses" by Kaya (2006) had a *very large* effect size (ES= 1.279). Similarly, another study titled "the effect of analogy-enhanced teaching on mathematical success and creative thinking ability of 9^{th} high school students" by Saygılı (2008) had also a *very large* effect size (ES= 1.279). In line with these findings, it can be said that analogy-enhanced teaching is likely to be more effective on students' creativity than the other different applications given above.

4. Discussion

This meta-analysis study was aimed to discuss the thematic-based meta-analytical quantitative data related to the effects of different applications including CBL, PBL, and DI on creativity in learning environments and the reflection of these effects to academic achievement of students. It was also aimed to evaluate studies which were not only included in the analysis under the theme of *Method* and *Approach* but also they involved in different applications according to effect coefficient values. In this context, first, different applications were discussed under three themes as "CBL, PBL and DI". Then, some different applications were introduced under the themes of "*Method*" and "*Approach*". Afterwards, related data were discussed. In other words, the analysis results were compared with the current studies in the literature and the results were interpreted separately. In addition, in order to indicate the reliability of the meta-analysis, fail-safe number was also found and interpreted by calculating the publication bias.

The first theme titled "*Creative- based learning*" was formed by combining studies related to the effects of applications, taking place in the scope of different applications but based on this title, on students' creativity. In this case, when data obtained from studies examining the effects of CBL environments on students' academic achievement were evaluated by REM, effect size value was found to be 0.850.This value can be interpreted as at a large level, positive and significant according to the classification of Thalheimer and Cook (2002) and therefore, it can be concluded that related

applications have very positive effects on academic achievement. This positive and significant result was consistent with the effect coefficients of all studies (Beydemir, 2010; Kadayıfçı, 2008; Karataş Öztürk, 2007; Özcan, 2009; Sak and Öz, 2010) and included in the analysis. In addition, similar results were also consistent with the results of the different studies which were conducted nationally and internationally (Tok, 2008; Wang, 2003) and excluded from the analysis. It can be interpreted that the results obtained from the studies included in the meta-analysis and related to the effects of creativity-based learning applications on academic achievement are quite consistent with those mentioned in the related literature. However, in a master's thesis titled "the effects of creative thinking activities on the creative web design of the elementary school students" by Saç (2011), the achievement scores obtained from website creating by the students participating in the research revealed that while the students of the experimental group were better in general design, there was no difference in terms of creativity. Therefore, it is likely to state that the results of this thesis are not consistent with the present results. In this meta-analytic study, the effect coefficients of the studies (Akay, 2006; Çoban, 2004; Eren, 2011; Kaçar, 2012; Ülger, 2011) related to the effects of *problem- based applications* comparing academic achievement scores of students on creativity were significantly different. Although the effect coefficients of the studies showed differences between 0.5593 and 3.0215, all the effect coefficients were positive. However, when the meta-analysis results of the studies in the theme of PBL according to REM were calculated, the standard error was 0.404 and the upper limit for 95% of the confidence interval was 2.353. The lower limit was 0.768 and the effect size was 1.560. The results indicated that in favor of PBL, academic achievement scores were better than traditional teaching methods. In addition, the effect size was calculated as at a large level, positive and significant according to the classification of Thalheimer and Cook (2002) and therefore, it can be said the use of the relevant applications in the learning environments had positive effects on academic achievement scores of students. Similar results were obtained from the studies (Çoban, 2004; Kaçar, 2012) in which students taking part in the experiment group were chosen and interviewed in order to determine their views on PBL. Descriptive statistics and content analysis were used in the evaluation of the qualitative data obtained from the interviews. This evaluation revealed that students in the experimental group had positive views on the PBL.

For meta-analysis results of the studies (Batdal Karaduman, 2012; Kaplan Sayı, 2013; Kök, 2012) in the theme of *DI-based applications*, the standard error was 0.729 and the upper limit for 95% of the confidence interval was 5.117 while the lower limit was -3.659 and the effect size was 0.729 which was accepted as medium according to the classification of Thalheimer and Cook (2002). The results indicated that in favor of DI, academic achievement scores were better than traditional teaching methods. In other words, the relevant applications had high levels of effectiveness in terms of academic achievement. On the other hand, when the effect coefficients of these three studies analyzed in detail, the effect coefficient of the study conducted by Batdal Karaduman (2012) was calculated as -3,8625. As for the effect coefficients of the other studies conducted by Kök (2012) and Kaplan Sayı (2013), they were d= 2.6530; d= 3.3902 respectively. It is remarkable that the related values were calculated in both negative and positive sense at outlier value levels, but in general the results indicated that DI-based applications increased students' academic achievement scores significantly.

When the effect sizes of different application based studies included in the analysis under the theme of "*Method"* and *"Approach"* on academic achievement in creativity based learning environments were calculated, the following effect levels were observed according to the classification of Thalheimer and Cook (2002): *insignificant* (Birinci, 2008; Kaya, 2010), *low* (Uysal, 2009), *medium* (Biber, 2006), and *very large* (Kaya, 2006; Saygılı, 2008). In general, the effect coefficients had positive/ meaningful effects on academic achievement of the related applications. In this context, this result obtained from the studies included in meta-analysis was consistent with the master's theses (Akdal, 2011; Aydın, 2011; Bacak, 2008; Çalışkan, 2006; Kayahan, 2010; Şahintürk, 2012; Yıldız, 2012;Yılmaz, 2006), PhD theses (Aktamış, 2007; Parker, 2008;Tezci, 2002) and articles (Altıntaş, Özdemir & Kerpiç, 2013; Gündoğan, Arı &Gönen, 2013; Kim & Kim, 2010; Naeini & Masood, 2012) which were conducted nationally and internationally in different years. In addition, the meta-analytic studies performed internationally by Davis (2009) and Feist (1998) had also positive effect sizes.

In conclusion, it is likely to say that studies grouped into three main themes as CBL, PBL and DI and additionally investigated as the effects of different applications on creativity were generally effective on academic achievements of students in teaching environments. Although various databases were searched nationally and internationally related to the effects of different applications on creativity, sufficient numbers of experimental studies were not reached. These results indicate that creativity should be given more importance in teaching environments especially in application dimension. In addition, it is recommended perform more studies related to this subject for future researchers.

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