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EXAMINING THE LEVEL OF CORRELATIONS BETWEEN THE FACTORS OF ARTISTIC CREATIVITY IN PUPILS OF SLOVENIAN PRIMARY SCHOOLS

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Abstract

The article is based on research of fine arts creativity carried out among elementary school fifth-grade students. The introductory theoretical section addresses children's fine arts development and analyses the very complex notion of fine arts creativity by defining its factors. The second part is an empirical study of fifth-grade students' fine arts creative skills, based on an assessment of the correlation between the factors defining fine arts creativity. Both descriptive and non-experimental methods were used on a systematic random sample of 1364 Slovene fifth-grade students. The results showed statistically significant differences in the level of fine arts development between the two genders, with the girls being more successful than the boys. The same is true of elaboration as a factor of fine arts creativity. The analysis of linear associations showed some connections between the factors encouraging fine arts creativity and between those enabling it. The connection between these two groups of factors was also established.

Keywords: factors of creativity, correlations, visual art, primary school

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Introduction

Even though the roots of the concept of creativity reach far back into the 20th century, it is still very much present in contemporary pedagogical research. Creativity is a complex concept, which is evident from various definitions we are offered by the relevant literature (Mumford, Mobley, Uhlman, Reiter-Palmon and Doares, 1991; Robinson, 2001; Sefton-Green and Sinker, 2000; Torrance, 1977). Koestler (1964) perceived it

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as the ability to connect previously unconnected ideas and the production of outcome, hence emphasizing the cognitive aspect. Some authors, emphasizing the thought-action aspect, describe it as the ability to produce new, creative ideas (Hitt, 1965; Newell and Shaw, 1972), while others see it as using the existing knowledge to find creative solutions, however maintaining that the new solution must have value (Jurman, 2004). The aspects of motivation and emotions for creating new ideas are related to cultural context and artists personality.

The importance of environment in boosting creativity was extensively stressed by Feldhusen and Hoover (2006), who claims that creativity results from the environment which places emphasis on academic growth on the basis of talent. It is not surprising that a growing number of countries strive towards incorporating creativity into their educational curriculums (Sharp and Le Métails, 2000; Craft, 2005; Davies, 2006; Stables, 2009). A creative learning environment, consisting of both the physical and pedagogic environment, is therefore supposed to be a place of knowledge, ownership, relevance and innovation (Jeffrey, 2006). Duh (2004) stresses the importance of creativity in children's environment, claiming that a creative atmosphere inspires students towards spontaneous work, adding that it is teachers' job to help develop children's creative joy by means of creative tasks and didactic tools. Jurišević (2011) points out that teacher can acquire additional competences in various programmes of in-service teacher training in order to deepen their knowledge of working with gifted students. Fryer (2009) also discovered that teachers' willingness to develop creativity differed mostly in variables related to teachers' ability to take students' needs into consideration. Teachers believed they were satisfying the students' need for autonomy at a higher level. Teachers often place little value on creative behaviours of their students, although they do generally claim to value creativity in their students (Matrić and Duh, 2015).

Creativity in art education can only be achieved through the implementation of productive and receptive art activities (Duh and Korošec-Bowen, 2014). Creativity is mainly associated with games, art and self-expression. Being a complex phenomenon we decided to break it down into four segments: creative personality, creative process, creative environment and creative product (Duh 2004, Moran 2010). Imagination, creative thinking, new ways to find solutions, and use objects in a different, atypical way, are the characteristics by which we recognize a creative person (Moran 2010). A creative personality is described as a person who can connect the theme, the technique, the visual language, as well as the style, and the national tradition into a

complete system, which achieves significantly higher quality than a simple mathematical sum of all mentioned components (Karlavaris in Berce Golob 1991). In children's creation, all the components given are not most often expressed at the same time, but we must pay attention to their possible involvement.

McLennan (2010) compares the importance of the creative process and the creative product in education and notes that it is far more important to promote the creative process to develop the child's creativity and not to focus on the final product only. In the creative process the development of quantitative artistic abilities comes first, then qualitative abilities develop, and when there is a twist of both, there is a creative leap that represents the general progress of the pupil (Karlavaris and Berce Golob 1991). The creative process takes place in the following stages (Duh 2004):

- Preparation (First step is getting familiar with the problem and gathering information that would be useful in solving the given task. At this stage, motivation is important because an unmotivated person would not even perceive the problem in the first place.),
- Incubation (At this stage, the collected information is 'weighed', it is useful to write real-time ideas so that we do not forget them. The incubation period does not have a time frame and can last for a short or a long time. It concludes with the discovery of the final solution, which represents the next phase.),
- Illumination (It arises when we come to the discovery of the solution to the problem that we have set, we can also call it aha-moment. Performs suddenly.)
- Realization (An art work arises which contains the solution of the problem.)
- Verification (It is the final stage of the creative process. It shows whether the discovered solution is creative or not. In the pedagogical process, the verification phase corresponds to the evaluation phase.)

Creativity is also influenced by the environmental influences in which the creative process takes place. We talk about the environment as space, for example, the classroom, or the wider social space, the community, and the people that influence the individual's creativity. The first aspect is the environment in the pedagogical process, that is, the art classroom, which should be different from the classrooms of other subjects. The creative environment of the classroom allows the child to surrender to the artistic process completely, develops his own expression and learns

on the experience, which allows the development of creative thinking, problem solving and reflection (McLennan 2010). The second aspect is a wider environment that is culturally and socially dependent. This means a visual world where a person lives and creates, a mentality of people living there, customs, values, etc. The environment can be a source of motivation in the pedagogical process (Karlavaris in Berce Golob 1991). Among environmental factors, we also include persons, teachers, educators who take care of the education and training of individuals and accompany them on the path of creative development, as well as sociologists, anthropologists and others (Jurman 2004). Social needs are a force that exerts pressure on an individual, and creation is thus the process of self-assertion in terms of its existence and also its generic essence (Jurman 2004).

The creative product as a criterion of creativity is the work of the person, the creator, and the product of the creative process (Duh 2004). The creative product could therefore be explained in two ways: the inner creative process or the imagination and the object or product that is the result of the creative process. Below we will focus on the final product, i.e. a prominent creative product that plays an important role in the process of evaluation in the learning process. The creativity of a creative product is evaluated based on originality, transformation and ability to search for changes that lead to solving the problem in a new, innovative way (Duh 2004).

Speaking of creativity, we often wonder, 'Is this idea creative? Yes or no? A much more appropriate question would be, 'How is this idea creative and in which aspects determine that?', as it also covers the multifaceted psychological processes that have encouraged or facilitated its emergence (Boden 2011). We will present the factors that influence the development of artistic creativity from the point of view of the creative product. The previous researches (Karlavaris 1981, Duh 2004, Herzog 2008, Herzog 2009) usually follow art creativity through a creative product, accompanied by six factors of artistic creativity, divided into two groups. The first group includes those who enable creativity: redefinition, fluency and elaboration. The second group is the factors that promote artistic creativity: originality, flexibility, sensitivity to artistic problems.

With originality, which encourages creativity, we monitor the individual and unexpected solutions of a given task that author managed to come up with. When monitoring the factor artistic redefinition, which enables creativity, we paid attention to the success of artistic transposition. This is seen as a deliberate redefinition of the idea, material, or visual

impression into something new. With the factor artistic flexibility, which promotes artistic creativity, we monitored the ability of adapting to means of artistic expression. It is shown as a coherence of the artistic idea and the applied art materials. Next factor is artistic fluency, which enables artistic creativity, where we monitor the successful mastering of art techniques. This appears in motor skills, which enable various fine operations and richer artistic processes. With the factor called sensitivity to artistic problems, which promotes artistic creativity, we monitor the experience when interpreting the given artistic task or problem. It is reflected in the sensibility of the artistic solution. With the factor of artistic elaboration, which enables artistic creativity, we monitor the planning of the artistic activity. It shows a coherence of the idea and the art materials used, as well as taking into account the art rules and directions (Herzog, 2009).

About the research

The purpose of the conducted empirical research was to monitor the development of creative abilities in pupils in Slovene primary schools. We examined:

- Level of development of artistic creativity (originality, flexibility, redefinition, fluency, elaboration, sensitivity to artistic problems).
- Differences in the level of development of artistic creative competences (originality, flexibility, redefinition, fluency, elaboration, sensitivity to artistic problems) according to the sex of pupils.
- Linear correlations between the factors of artistic creativity that promote creativity (originality, flexibility, sensitivity to artistic problems), and factors that enable artistic creativity (redefinition, fluency, elaboration), according to the whole sample.
- Linear correlations between the factors of artistic creativity that promote creativity (originality, flexibility, sensitivity to artistic problems), and factors that enable artistic creativity (redefinition, fluency, elaboration) in boys and girls.

When planning the research, we proceeded from next seven hypotheses:

- H_{LU} : We assume that there are no statistically significant gender differences in the level of development of artistic creativity.
- H_{LUsp1} : We assume that there are no statistically significant gender differences in the originality factor.
- H_{LUsp2} : We assume that there are no statistically significant gender differences in the flexibility factor.
- H_{LUsp3} : We assume that there are no statistically significant gender differences in the redefinition factor.
- H_{LUsp4} : We assume that there are no statistically significant gender differences in fluency.
- H_{LUsp5} : We assume that there are no statistically significant gender differences in the elaboration factor.
- H_{LUsp6} : We assume that there are no statistically significant gender differences in the sensitivity to artistic problems.

The survey was carried out in a random, informal sample of 298 pupils in 5th grade of Slovenian elementary schools.

The gender profile was quite balanced, with 152 (51%) boys and 146 (49%) girls in the survey.

Results

Below we present an analysis of the basic descriptive statistics of the results according to the individual factor of artistic creativity and the total level of artistic creativity.

Factors that promote creativity:

Table 1: Basic descriptive statistics of the results of the level of development of artistic creativity with regard to the whole sample - the factor of artistic creativity: originality

FACTOR OF ARTISTIC CREATIVITY	n	MIN	MAX	Arithmetic mean \bar{x}	Standard deviation s	Skew.	Kurt.
ORIGINALITY	298	0,00	6,00	1,1846	0,70794	1,497	2,886

The distribution of the originality factor is left asymmetrical, which is the result of exclusively higher achievements. Highly consistent results ($KS > 0$) also show the dominant high results. This points to a high proportion of art products containing genuine, original, unusual artistic solutions.

Table 2: Basic descriptive statistics of the results of the level of development of artistic creativity with regard to the whole sample - the factor of artistic creativity: flexibility

FACTOR OF ARTISTIC CREATIVITY	n	MIN	MAX	Arithmetic mean \bar{x}	Standard deviation s	Skew.	Kurt.
FLEXIBILITY	298	0,00	6,00	1,5604	1,27843	1,782	2,408

Also, the distribution of the factor flexibility is left asymmetric and pointed ($KS > 0$), which shows the dominant higher achievements. The result suggests that those art products prevailed, where pupils successfully adapted art material in the expression of the artistic idea.

Table 3: Basic descriptive statistics of the results of the level of development of artistic creativity with regard to the whole sample - the factor of artistic creativity: sensitivity to artistic problems

FACTOR OF ARTISTIC CREATIVITY	n	MIN	MAX	Arithmetic mean \bar{x}	Standard deviation s	Skew.	Kurt.
SENSITIVITY	298	0,00	5,00	2,2315	1,02662	0,125	- 0,660

The distribution of the sensitivity factor for artistic problems is rather symmetrical ($0.5 > KA > - 0.5$) and somewhat flattened ($KS < 0$), which means the predominance of average results. The results show that art products are average in terms of sensitivity to the artistic problem.

Factors that enable creativity:

Table 4: Basic descriptive statistics of the results of the level of development of artistic creativity with regard to the whole sample - a factor of artistic creativity: redefinition

FACTOR OF ARTISTIC CREATIVITY	n	MIN	MAX	Arithmetic mean \bar{x}	Standard deviation s	Skew.	Kurt.
REDEFINITION	298	0,00	6,00	1,8221	1,18289	0,324	- 0,289

The distribution of the redefinition factor is also quite symmetric ($0.5 > KA > - 0.5$) and somewhat flattened ($KS < 0$), therefore, the average results predominate. Students' ability to transform already known artistic solutions into new and different ones turned out to be rather average.

Table 5: Basic descriptive statistics of the results of the level of development of artistic creativity in relation to the whole sample - the factor of artistic creativity: fluency

FACTOR OF ARTISTIC CREATIVITY	n	MIN	MAX	Arithmetic mean \bar{x}	Standard deviation s	Skew.	Kurt.
FLUENCY	298	0,00	6,00	2,9430	1,36334	- 0,057	- 0,210

In the case of fluency, the right asymmetric distribution is the result of lower results in this factor. The distribution is also somewhat flattened ($KS < 0$). This result tells us that the students involved in our research had too few ideas for artistic expression.

Table 6: Basic descriptive statistics of the results of the level of development of artistic creativity with regard to the whole sample - the factor of artistic creativity: elaboration

FACTOR OF ARTISTIC CREATIVITY	n	MIN	MAX	Arithmetic mean \bar{x}	Standard deviation s	Skew.	Kurt.
ELABORATION	298	0,00	6,00	2,4664	1,07020	0,312	0,239

The distribution of the elaboration factor is symmetric ($0.5 > KA > -0.5$) and somewhat pointed ($KS > 0$). This means that higher results predominate. This tells us that the artwork of the students were consistent in the idea, materials and design of the artistic proces.

Overall level:

Table 7: The basic descriptive statistics of the results of the level of development of artistic creativity with regard to the whole sample

FACTOR OF ARTISTIC CREATIVITY	n	MIN	MAX	Arithmetic mean \bar{x}	Standard deviation s	Skew.	Kurt.
OVERALL LEVEL	298	0,00	36,00	12,2081	3,35302	0,164	0,737

The total distribution of all factors of artistic creativity is symmetrical ($0.5 > KA > - 0.5$) and fairly pointed ($KS > 0$), which means on average average results with the exception of significantly better results in the factors originality and flexibility.

Analysis of Level of Development of Art Creativity According to Sex

The results obtained in relation to artistic creative abilities were compared with regard to gender differences.

Table 8: Analysis of the differences in the level of development of artistic creative abilities with respect to the sex of pupils

FACTOR OF ARTISTIC CREATIVITY	G	\bar{x}	s	F-test		t-test	
				F	P	t	P
ORIGINALITY	M	1,1849	0,76116	1,434	0,232	0,009	0,993
	F	1,1842	0,65530				
FLEXIBILITY	M	1,5479	1,25441	0,001	0,979	- 0,165	0,869
	F	1,5724	1,30512				
REDEFINITION	M	1,7397	1,20376	0,215	0,643	- 1,180	0,239
	F	1,9013	1,16095				
FLUENCY	M	2,8219	1,45121	6,481	0,011	- 1,501	0,134
	F	3,0592	1,26718			aproximation	
ELABORATION	M	2,2877	1,07613	0,061	0,806	- 2,860	0,005
	F	2,6382	1,03929				
SENSITIVITY TO ARTISTIC PROBLEMS	M	2,1644	1,08296	1,422	0,234	- 1,107	0,269
	F	2,2961	0,96864				
OVERALL LEVEL	M	11,7466	3,35449	0,028	0,868	- 2,346	0,020
	F	12,6513	3,30214				

The result of the F-test of variance homogeneity shows that the assumptions are justified in all aspects of artistic creativity, with the exception of artistic fluency, and therefore the outcome of the approximate t-test method is stated. There is a statistically significant gender difference in the overall achievement of the test ($P = 0.02$). Depending on the factors of artistic creativity, girls are more successful, this is also evident from a higher average value. H_{LU} hypothesis, which says that there are no statistically significant gender differences in the level of development of artistic creativity, we have therefore rejected. Even Duh (2004) and Herzog (2008) in their studies find that the level of general artistic creativity of girls is slightly higher than boys. Nevertheless, they find that statistically significant differences in the level of creativity between the sexes were not observed. The statistically significant difference between boys and girls is also found in achievements in elaboration ($P = 0.005$). Girls are more successful than boys at elaboration, which means that we have rejected the H_{LUsp5} hypothesis. (We assume that there are no statistically significant differences between the sexes in the elaboration factor). In other factors of artistic creativity we did not find statistically significant differences between the sexes, thus confirming next hypotheses: H_{LUsp1} (We assume that there are no statistically significant gender differences in

originality factor.), H_{LUsp2} (We assume that there are no statistically significant gender differences in flexibility factor.), H_{LUsp3} (We assume that there are no statistically significant gender differences in the redefinition factor.), H_{LUsp4} (We assume that there are no statistically significant gender differences in the fluency factor.) and H_{LUsp6} (We assume that there are no statistically significant gender differences in sensitivity to fine arts factor.).

Analysis of Linear Correlations Between Factors of Art Creativity - Factors of Enableing and Promoting Art Creativity

We have also verified the existence of linear correlations between the factors of artistic creativity, which stimulate enable creativity, and the factors that promote artistic creativity.

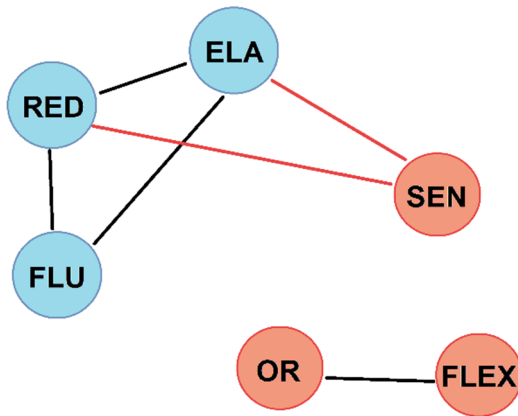
(OR = originality, FLEX = flexibility, SEN = sensitivity to artistic problems, FLU = fluency, RED = redefinition, ELA = elaboration)

Table 9: Pearson's correlation between the factors of promoting artistic creativity and factors enableing artistic creativity on the whole sample

		OR	FLEX	SEN	FLU	RED	ELA
OR	Pearson (r)	1	0,239	0,089	0,049	0,051	0,064
	P		0,000	0,124	0,396	0,377	0,273
FLEX	Pearson (r)	0,239	1	0,034	-0,011	0,077	0,003
	P	0,000		0,556	0,856	0,183	0,963
SEN	Pearson (r)	0,089	0,034	1	0,041	0,200	0,162
	P	0,124	0,556		0,484	0,001	0,005
FLU	Pearson (r)	0,049	-0,011	0,041	1	0,194	0,122
	P	0,396	0,856	0,484		0,001	0,035
RE	Pearson (r)	0,051	0,077	0,200	0,194	1	0,228
	P	0,377	0,183	0,001	0,001		0,000
ELA	Pearson (r)	0,064	0,003	0,162	0,122	0,228	1
	P	0,273	0,963	0,005	0,035	0,000	

By analysing linear connections, we have found that from the point of view of the whole sample, there are differences in the connection between the factors that promote artistic creativity that is originality and flexibility. We did not detect other linear links in the group of stimulating factors. For factors that enable artistic creativity, we have found that the factors are linearly connected, and there is a linear connection between fluency and redefinition, fluency, and elaboration and redefinition.

We especially wanted to check the existence of linear connections between the two groups. We have established that there is a linear connection between redefinition, a factor that enables artistic creativity, and a sensitivity to artistic problems, a factor that stimulates artistic creativity. There is also a linear connection between elaboration, a factor that enables artistic creativity, and a sensitivity to artistic problems, a factor that stimulates artistic creativity. For easier understanding we present the results in next scheme:



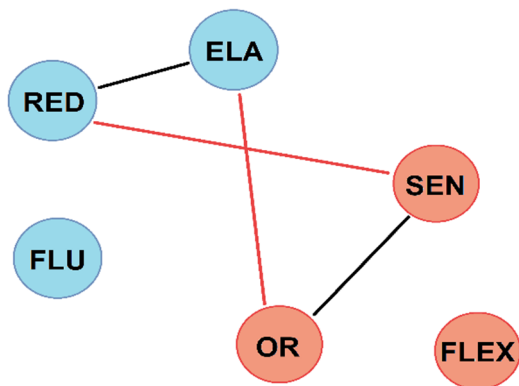
Scheme 1: Schematic representation of linear correlations between the factors of enabling artistic creativity and the factors of promoting artistic creativity from the point of view of the whole sample

Analysis of Linear Correlations Between Factors of Art Creativity - Factors of Enabling and Promoting Art Creativity – Boys

Table 10: Pearson's correlation between the factors of promoting artistic creativity and factors enabling artistic creativity - boys

		OR	FLEX	SEN	RE	FLU	ELA
OR	Pearson (r)	1	0,124	0,164	0,091	0,011	0,221
	P		0,135	0,048	0,277	0,892	0,007
FLEX	Pearson (r)	0,124	1	- 0,001	0,091	- 0,075	0,031
	P	0,135		0,993	0,277	0,369	0,714
SEN	Pearson (r)	0,164	- 0,001	1	0,176	0,028	0,119
	P	0,048	0,993		0,034	0,741	0,153
RE	Pearson (r)	0,091	0,091	0,176	1	0,111	0,207
	P	0,277	0,277	0,034		0,180	0,012
FLU	Pearson (r)	0,011	- 0,075	0,028	0,111	1	0,104
	P	0,892	0,369	0,741	0,180		0,213
ELA	Pearson (r)	0,221	0,031	0,119	0,207	0,104	1
	P	0,007	0,714	0,153	0,012	0,213	

By analysing linear connections, we found that in case of boys there are connections between factors that stimulate artistic creativity, that is, originality and sensitivity to artistic problems. We did not detect other linear links in the group of stimulating factors. In determining the factors that enable artistic creativity, we have established a linear connection between redefinition and elaboration. The relationship between the two groups of factors has been shown during redefinition and sensitivity to visual problems and between elaboration and originality. The correlations can be seen in next scheme:



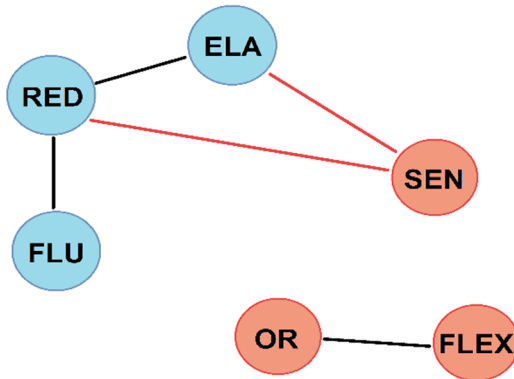
Scheme 2: Schematic representation of linear correlations between the factors of enabling artistic creativity and the factors of promoting artistic creativity - boys

Analysis of linear correlations between factors of art creativity - factors of enabling and promoting art creativity – girls

Table 11: Pearson's correlation between the factors of promoting artistic creativity and factors enabling artistic creativity - girls

		OR	FLEX	SEN	RE	FLU	ELA
OR	Pearson (r)	1	0,364	- 0 ,003	0,007	0,098	- 0,115
	p		0,000	0,971	0,935	0,228	0,157
FLEX	Pearson (r)	0,364	1	0,069	0,064	0,055	- 0,027
	p	0,000		0,396	0,435	0,497	0,742
SEN	Pearson (r)	- 0,003	0,069	1	0,220	0,045	0,193
	p	0,971	0,396		0,006	0,582	0,017
RE	Pearson (r)	0,007	0,064	0,220	1	0,279	0,234
	p	0,935	0,435	0,006		0,001	0,004
FLU	Pearson (r)	0,098	0,055	0,045	0,279	1	0,117
	p	0,228	0,497	0,582	0,001		0,151
ELA	Pearson (r)	- 0,115	- 0,027	0,193	0,234	0,117	1
	p	0,157	0,742	0,017	0,004	0,151	

The analysis of the linear relationships between the factors showed that in girls' case there is a correlation between the factors that enable artistic creativity, between redefinition and elaboration, and redefinition and fluency. In the group of factors promoting artistic creativity, the correlation between originality and flexibility was revealed. Among the two groups of factors, there is a correlation between the sensitivity factors for artistic problems and redefinition, as well as the sensitivity to artistic problems and elaboration. Results are shown in the following scheme:



Scheme 3: Schematic representation of linear correlations between the factors of enabling artistic creativity and the factors of promoting artistic creativity

Boys showed a way of solving artistic problems through the coherence of the artistic idea with the execution of an artistic task, which means new, unique solutions. Girls come to the results with use of previous artistic experience and imagination. Girls turned out to be somewhat better in their creative abilities. Depending on the correlations found, we can say that girls and boys come to the resolution of artistic problems in a somewhat different way. We can conclude that in general, the fifth grade students, regardless of gender, achieve similar results.

Conclusion

In the study, we set out seven hypotheses related to the level of development of artistic creativity from the point of view of gender. We rejected the H_{LU} hypothesis, which says that there are no statistically significant gender differences in the level of development of artistic creativity, as girls have proved to be slightly more successful than boys. Other authors (Duh, 2004 and Herzog, 2008) also find differences in the development of artistic creative abilities in boys and girls, but not statistically significant. We also rejected the $H_{LU_{sp5}}$ hypothesis, since a statistically significant difference in the achievements in elaboration was found. Girls were a bit better this time as well. We can conclude that

when preparing a creative process, the girl is better organized, which shows a more coherent artistic process. We confirmed other hypotheses as no statistically significant gender differences were found in the factors of artistic creativity (originality, flexibility, redefinition, fluency and sensitivity to artistic problems).

A linear correlation between the three factors, which enables artistic creativity (redefinition, elaboration and fluency), was established. We confirmed the linear correlation between two factors that promote creativity (originality and flexibility). Linear correlations were found between the factors of facilitating and promoting artistic creativity in boys and girls. The groups showed the links between elaboration and originality, and between redefinition and sensitivity to artistic problems in boys. In girls, the linear correlation between the groups represents the relationship of the factor sensitivity to visual problems with elaboration and redefinition.

Boys showed a way of solving artistic problems through the coherence of the artistic idea with the execution of an artistic task, which means new, unique solutions. Girls come to the results of tasks with use of previous artistic experience and using imagination. Depending on the correlations found, we can say that girls and boys come to the resolution of artistic problems in a somewhat different way. We can conclude that in general, the fifth grade students, regardless of gender, achieved similar results.

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