

## Determining the Connection Between Creativity in Pupils and Teachers

**Dominika DOKTOROVÁ\***<sup>1</sup>

**Andrea BARANOVSKÁ**<sup>2</sup>

<sup>1</sup> Univerzita sv. Cyrila a Metoda v Trnave, Slovakia, dominikka.doktorova@gmail.com

<sup>2</sup> Trnava Univesity, Slovakia, andrea.baranovska@gmail.com

**Abstract:** *In the research, we focus on the issue of creativity in school classrooms, especially on the connection between creativity in students and their teachers. The work aims to find whether there is a statistically significant connection between the variables or if the variables are related. The Torrance Figural Test of Creative Thinking (TTCT) and its subtest - Repeated Figures - are used to measure creativity. The research sample in our research consists of 104 students from the ages of 10 to 12 and 11 teachers. In the results, we found that the relationship between students' creativity and the creativity of their teachers is not statistically significant.*

**Keywords:** *Creativity, middle school age, pupil, teacher, connection.*

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## Introduction

It is not possible to develop a student's creativity without the work of family members, teachers, or other people the student deems important. Of course, there are certain personality characteristics of the student that place him in the more or less creative group, but the stimuli from the environment are relevant. According to Feldman, it is for this reason (Salbot & Pašková, 2009) that we can assume that interpersonal, educational, and social relationships are often crucial for the development of creativity. The basic condition for developing a pupil's creativity in the school environment is that the teacher himself knows what the term creativity means. The teacher should be able to notice the creative potential of the child, to which it is then necessary to respond appropriately so that the child is not afraid of his original ideas. A creative teacher not only verbally supports creative students, but his activity is also reflected in non-standard approaches to education. He uses playful, fun, informative, and interesting methods during lessons. A non-creative teacher can suppress creativity in students with excessive didacticism and normativity (Sharp, 2004). The authors Zelina and Zelinová (1997, In: Gorej, 2010) state that the difference between a creative and a non-creative teacher is that a creative teacher has a certain childishness, can combine creativity and discipline, responsibility with irresponsibility, alternates imagination with reality, he is energetic and peaceful. Creativity should be an integral part of a teacher's daily life. The teacher must create and be creative to keep the attention of his students for the whole lesson (Kováč & Keklak, 2003). Creativity and creative teaching are currently important in all subjects. However, the research of P. Kampilis et al. (2009) points out the fact that, according to teachers, creativity is appropriate only in the subjects of art, theater, and music education. We cannot forget that creative teachers and creative learning are key components in promoting creativity in students. Runco and Craft (In: Sharp, 2004) emphasize that the role of the teacher is to provide a balance between structure and freedom of expression in the classroom. Through their behavior, teachers can support students' creativity. It is the right behavior and attitude which they present to and support in children, asking the right questions, tolerating the ambiguity, supporting experimentation, and also praising students for unexpected answers. O. Dau-Gaspar (2012) found that teachers' creativity has a significant effect on students' creativity and creative attitudes. Many teachers' creative attitudes correlate positively with those of their students'. Traft and Gilchrist (Dau-Gaspar, 2012) confirmed that there is a strong link between creative attitudes and creativity itself. Creative

teachers with creative attitudes have a strong impact on students' creative abilities. In this context, in addition to stimulating creativity in the classroom, it is important to focus on teachers' creativity. The success of students' creativity depends largely on the creativity of the teacher (Petlák, 2006; Salbot & Pašková 2009). This opinion is also held by Kováč and Keklak (2003). Creative students have similar characteristics to creative teachers. Lokša and Lokšová (1999) state that creative students can be characterized by independence, increased aggression, and they prefer to work alone rather than with other members of a group. Standards and regulations in a group can cause them problems because they do not like adapting. They are active, dynamic, and also show good leadership skills. They solve new and challenging tasks or problems with courage and divergent ways. They may appear to be hyperactive and undisciplined individuals in a class collective. They also do not lack humor, playfulness, or a willingness to help classmates. They are curious, which manifests in asking the teacher questions frequently (Mihálik, 1988, In: Lokša, Lokšová, 1999). Amalileová (Salbot & Pašková, 2009) states that it is necessary to support students' curiosity and especially asking questions because the development of knowledge and creativity is not possible without support. In a study by Torrance (Salbot, 2007), creative students also showed original, extraordinary ideas, their work was aimed at finding new unexplored ways, and it was full of playfulness and humor. The characteristics of creative students suggest that such students require an individual approach from teachers. In the opinion of Pašková and Salbot (2009), by developing, or at least not suppressing the creative qualities of students, the educational system and thus the teacher can help educate future creative individuals.

The research problem of our work is to examine the creativity of primary school students based on the above research and theoretical knowledge. The research of Kováč and Keklak (2003), of O. Dau-Gaspar (2012), and others (e.g. McLellan, Nicholl, 2008) inspired us to add a sample of teachers who teach in the given classes to the basic research sample of students. Teachers often become role models for their students, so they should lead by example. The above-mentioned researches have confirmed that thanks to a creative teacher, creativity also manifested in the student. Usually, research of this type focuses on the creativity of the first stage of primary students and their classroom teachers, with less attention paid to older students. Each subject being taught by a different teacher is typical for the second stage of primary school. The class teacher has fewer teaching hours in his class compared to other teachers. Therefore, we focus on the examination of creativity in the group of teachers teaching in given classes,

and then we compare the individual factors of teachers' creativity with the factors of students' creativity. The creative abilities of teachers and students manifest through the interactions that take place in the classroom.

#### Research objectives

Based on the theoretical knowledge and research presented in the previous chapter, which was focused on creativity, we set the following research goals. The main objective of the research is to find out whether there are connections between creativity in primary school pupils and teachers.

A, finding connections between the creativity of students and the creativity of their class teachers,

B, searching for connections between the creativity of students and the creativity of other teachers,

Research by O. Dau-Gaspar (2012) and Kováč and Keklak (2003) confirmed that teachers' creative abilities significantly influence students' creativity. The research was carried out with class teachers and their students. Based on the above research, we set the first hypothesis, from which we derived two working hypotheses.

**H1:** We assume that there is a significant relationship between individual factors of creativity of teachers' students.

**WH1:** We assume that there is a significant relationship between the individual factors of creativity of students and their class teachers.

**WH2:** We assume that there is a significant relationship between the individual factors of creativity of students and other teachers.

## Methods

### *Research sample*

We obtained a research sample for our research based on a deliberate selection. The research sample in our research was formed by pupils of the 5th and 6th grades of one primary school in the district of Brezno. In the research, we worked with 104 respondents, aged 10 to 12 years. Of the 104 students (100%), 55 were boys (53%) and 49 girls (47%). We also expanded the research with a research sample of class teachers and teachers normally teaching in given classes. From the teaching staff, 11 teachers took part in the research, of which 5 were class teachers of the classes in which we carried out the research. In terms of gender, the number of female teachers outnumbered male teachers by 9:2. The teachers in our sample are comparable in terms of equal pay, have the same methods of

evaluation, and are involved in the same projects. Pupils are comparable in terms of school-level and socioeconomic status.

Tab. no. 1 Research sample of students

| CLASSES  | BOYS | GIRLS | TOGETHER |
|----------|------|-------|----------|
| 5.A      | 7    | 14    | 21       |
| 5.B      | 12   | 12    | 24       |
| 6.A      | 13   | 6     | 19       |
| 6.B      | 12   | 7     | 19       |
| 6.C      | 11   | 10    | 21       |
| TOGETHER | 55   | 49    | 104      |

(Sourced: Work of the author)

Tab. no. 2 Research sample of teachers

|          | MALE<br>TEACHERS | FEMALE<br>TEACHERS | TOGETHER |
|----------|------------------|--------------------|----------|
| TOGETHER | 2                | 9                  | 11       |

(Sourced: Work of the author)

## Materials and apparatus

In this section, we will introduce the research methods we worked with during the implementation of our research.

### *Torrance's figural test of creative thinking*

Jurčová (1984) standardized the test for the Slovak population. The test determines the general creative potential. Through answers from three subtests, it is possible to measure flexibility (ability to create various solutions of tasks), originality (ability to produce new, original solutions, originality is considered the rarest factor of creativity), fluency (ability to create as many ideas and products within a certain time limit), and elaboration (ability to work out details of the solution). The test can be used individually, but also in groups, from preschool age to adulthood. In our work, we used the 3rd subtest - repeated figures, and we focused on fluency, flexibility, and originality. In this activity, the individual has the task to complete 40 identical circles. He can connect the circles, draw in circles, or outside them.

### ***Statistical processing***

We used a specialized statistical computer program Statistical Package for the Social Sciences - SPSS 20 to process research data. Given that we carried out comparative-correlation research, we used the following things:

Reliability test to determine normality,

Descriptive statistics to describe the data obtained (Average, SD, Min., Max.),

Spearman's correlation analysis for determining connections,

### ***Analysis of results***

First of all, we statistically described the research setting, so we calculated the average values, the standard deviation, the minimum and maximum values of the gross scores of the distributed questionnaires. Specifically, we worked with questionnaires measuring the climate of creativity - the "Torrance test of creative thinking." The individual descriptive values are given in table no. 3.

Table 3 Descriptive analysis - Torrance's test of creative thinking

|                               | <b>ORIGINALITY</b> | <b>FLEXIBILITY</b> | <b>FLUENCY</b> |
|-------------------------------|--------------------|--------------------|----------------|
| <b>STUDENTS</b>               |                    |                    |                |
| <b>AVERAGE</b>                | 0,6                | 6,3                | 12,3           |
| <b>DIRECTION OF DEVIATION</b> | 1,08               | 3,21               | 4,89           |
| <b>MINIMUM</b>                | 0                  | 1                  | 4              |
| <b>MAXIMUM</b>                | 3                  | 18                 | 31             |
| <b>CLASS TEACHERS</b>         |                    |                    |                |
| <b>AVERAGE</b>                | 1,5                | 9,1                | 20,8           |
| <b>DIRECTION OF DEVIATION</b> | 1,38               | 3,61               | 7,60           |
| <b>MINIMUM</b>                | 0                  | 6                  | 15             |
| <b>MAXIMUM</b>                | 3                  | 16                 | 34             |
| <b>TEACHERS</b>               |                    |                    |                |
| <b>AVERAGE</b>                | 0,8                | 10                 | 22,5           |
| <b>DIRECTION OF DEVIATION</b> | 1,17               | 2,83               | 10,37          |
| <b>MINIMUM</b>                | 0                  | 7                  | 12             |
| <b>MAXIMUM</b>                | 3                  | 14                 | 36             |

(Sourced: Work of the author)

In table no. 2, we see the average values of students and teachers and class teachers in individual factors of creativity. In all three creativity factors, students achieved low scores on average (MO = 0.6; MF = 12.3; MFX = 6.3). Regarding class teachers, they achieved low scores in the flexibility factor (MFX = 9.1) and average scores in the originality (MO = 1.5) and fluency (MF = 20.8) factors. Other teachers achieved low values in the factors of originality (MO = 0.8) and flexibility (MFX = 10), while they achieved higher average scores in the factor of fluency (MF = 22.5).

The connection between the creativity of teachers and students

**H1:** We assume that there is a significant relationship between individual factors of creativity of teachers' students.

**WH1:** We assume that there is a significant relationship between the individual factors of creativity of students and their class teachers.

Based on a test of normality that was not confirmed, we chose Spearman's correlation analysis to test the relationship between students' and class teachers' creativity.

Tab. no. 4 the connection between the creativity of students and class teachers

| CLASS TEACHERS |   | STUDENTS    |             |         |
|----------------|---|-------------|-------------|---------|
|                |   | ORIGINALITY | FLEXIBILITY | FLUENCY |
| ORIGINALITY    | r | 0,17        | 0,14        | 0,07    |
|                | p | 0,081       | 0,147       | 0,497   |
| FLEXIBILITY    | r | 0,03        | 0,13        | -0,09   |
|                | p | 0,784       | 0,191       | 0,353   |
| FLUENCY        | r | 0,07        | 0,16        | -0,09   |
|                | p | 0,469       | 0,096       | 0,356   |

r - Correlation coefficient

p - Achieved significance

(Sourced: Work of the author)

Tab. no. 4 shows that there is no significant relationship between class teachers and students in any of the creativity factors ( $p_{o1} = 0.081$ ;  $p_{o2} = 0.784$ ;  $p_{o3} = 0.469$ ;  $p_{FX1} = 0.147$ ;  $p_{FX2} = 0.191$ ;  $p_{FX3} = 0.096$ ;  $p_{F1} = 0.497$ ;  $p_{F2} = 0.353$ ;  $p_{F3} = 0.356$ ).

**WH2:** We assume that there is a significant relationship between the individual factors of creativity of students and other teachers.

The test of normality did not show a normal distribution even in the sample of teachers, so in this case, we chose Spearman correlation analysis to test the relationship between the creativity of students and other teachers.

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Tab. no. 5 the connection between the creativity of students and teachers

| TEACHERS    |   | STUDENTS    |             |         |
|-------------|---|-------------|-------------|---------|
|             |   | ORIGINALITY | FLEXIBILITY | FLUENCY |
| ORIGINALITY | r | -0,16       | -0,13       | -0,11   |
|             | p | 0,091       | 0,184       | 0,287   |
| FLEXIBILITY | r | -0,27       | -0,13       | 0,09    |
|             | p | 0,784       | 0,191       | 0,353   |
| FLUENCY     | r | -0,10       | -0,18       | 0,06    |
|             | p | 0,294       | 0,060       | 0,521   |

r - Correlation coefficient

(Sourced: Work of the author)

p - Achieved significance

From table no. 5 we can state that even between other teachers and students there is no significant relationship IN any of the factors of creativity ( $p_{o1} = 0.091$ ;  $p_{o2} = 0.784$ ;  $p_{o3} = 0.294$ ;  $p_{FX1} = 0.184$ ;  $p_{FX2} = 0.191$ ;  $p_{FX3} = 0.060$ ;  $p_{F1} = 0.287$ ;  $p_{F2} = 0.353$ ;  $p_{F3} = 0.521$ ). Based on the results we can state that we do not accept hypothesis no. 1 because the relationship is not significant. The creativity of students and class teachers, as well as the creativity of students and other teachers, are unrelated.

Based on the result of hypothesis no. 1, we decided to look at the originality factor for class teachers and the number of original students in each of their classes.

Tab. no. 6 number of original pupils in classes and the value of class teacher's originality

| CLASS | NUMBER OF STUDENTS | NUMBER OF CREATIVE STUDENTS IN CLASS | AVERAGE CREATIVITY | THE VALUE OF TEACHER'S CREATIVITY |
|-------|--------------------|--------------------------------------|--------------------|-----------------------------------|
| 5.A   | 21                 | 8                                    | 0,8                | 3                                 |
| 5.B   | 24                 | 9                                    | 0,83               | 3                                 |
| 6.A   | 19                 | 4                                    | 0,47               | 0                                 |
| 6.B   | 19                 | 7                                    | 0,68               | 1                                 |
| 6.C   | 21                 | 4                                    | 0,42               | 0                                 |

(Sourced: Work of the author)

In table no. 6, we can notice that the class teachers of classes 5. A and 5. B, who have the highest values in the factor of originality ( $TUO = 3$ ), have the most creative students in their classes in terms of numbers. Just behind them was the class teacher of 6. B, with seven creative students in



the class. Teachers of classes 6. A and 6. C reached the lowest possible value in the factor of originality ( $TUO = 0$ ). It is possible that this was reflected in the low number of creative students in the class. Given the total number of students in each class, the numbers of creative students are not significant; therefore we could not accept hypothesis No. 1.

## **Discussion**

The aim of the work was to find out whether there are individual connections and differences between creativity and evaluation of the classroom climate in pupils and teachers.

## **Interpretation of results**

The aim of our first hypothesis focused on the connection between creativity between students and teachers, consisted of two working hypotheses and read as follows: "We assume that there is a significant relationship between the various factors of creativity of students and teachers." In our first hypothesis, the relationship between the creativity factors of class teachers and their students did not prove to be significant, in any of the factors. On the contrary, the research of Kováč and Keklak (2003) confirmed the significant influence of the creative abilities of class teachers on the creative abilities of their students. Different research findings may be due to other methods used to measure the creative abilities of students and teachers, but also due to differences in the research sample. Kováč and Keklak (2003) used Urban's creativity test, where they worked with the total score of figural creativity. Their research sample consisted of 4th-grade primary school students and their classroom teachers. Compared to the above research, we used only one of the subtests of the Torrance test of creative thinking, namely unfinished circles, and then we worked with individual factors of creativity. The test was standardized in 1984, the standards are 33 years old, during which time progress has been made in various areas, such as information technology or greater openness of society, in terms of expressing thoughts and ideas that have been taboo in the past, in the present, there are other creative expressions than in the handbook, so it would be appropriate to update the standards. In the research sample, we focused on primary school students and their classroom teachers, who often do not spend enough time with their students to confirm the connection between their creativity and the creativity of their students. We must also emphasize the time aspect. The research mentioned above was carried out 14 years ago, at that time there could have been better curricula than at

present, which could be reflected in the results of our research. The reason for the lack of connection between the creativity of class teachers and the creativity of students can also be the developmental period in which students are, in our case, it is middle school age. During this period, the teacher is no longer as important for the child as in the younger school age, so his importance decreases. Relationships with classmates, their recognition and acceptance are becoming important for the child. Although the relationship between the creativity of class teachers and the creativity of students was not statistically significant, we focused on the factor of creativity of class teachers in relation to the number of original students in each classroom. Based on our findings, we confirmed that the originality of the class teacher is related to the number of creative students in the class. We believe that with a larger number of students in the classroom, work and cooperation with them are more difficult. It is much more difficult to practice an individual approach to students, which may not be beneficial for the creativity and originality of the teacher or creativity and originality of his students. It is interesting that in our research, in the class with the highest number of students, there was also the highest number of original students, which may be because the class teacher probably uses his originality, makes creative tasks, and supports his students in the right way. We noticed a certain connection between the creativity of the class teacher and the number of creative students in the class, but in terms of the total number of students in individual classes and the values achieved, however, our findings did not prove statistically significant in the first working hypothesis. This result may also have been distorted by which subjects taught the class teachers teach and, in particular, by how they implement and work with pupils. We know that in Slovakia various researches focused on working with students on various subjects and the development of creativity in schools in Slovak language, foreign languages, and science subjects, which confirmed the effectiveness of creativity development programs (Ďurič & Ďurič, 1981; Klindová et al., 1990; Lokšová et al., 1999; Tírpáková et al., 2004). In our research sample, class teacher of 5.A teaches biology and English in her class, class teacher of 5.B teaches geography, art education, and class teacher of 6.B teaches mathematics and physics. In our research, we did not use the program to develop creativity, so we cannot determine how individual teachers affect the originality, and we can only assume that class teachers in these classes use more creative tasks in their subjects, trying to develop students' originality. Class teacher of 6.A teaches ethical education and physical education in his class, and the class teacher of 6.C teaches ethical education and music education in his class. Physical

education is a subject, in which it is possible to develop movement creativity, creating sets within gymnastics, or using relaxation techniques. The organization of teaching places high demands on the functional fitness of students, but they have little room for rest and regeneration. Long-term overload of students can result in reduced student performance as well as reduced personal well-being, which could have resulted in bland results in the student creativity test in our sample. However, within the subject of physical education, some teachers also include techniques for relieving and eliminating physical and mental tension in the curriculum, which can help improve their performance in other subjects (Lokšová et al., 1999). The subject of music education contributes to the creative acquisition of music. Students also get to know music in connection with other types of art. This is another form in which creativity can be realized (Hercegová, 2010). In the classes where the last-mentioned class teachers recorded the least original pupils, it should be noted that in the 2nd stage of primary schools there is a low subsidy for hours of music education, ethical education, and especially physical education. The fact that the first working hypothesis did not confirm the creativity of class teachers with the creativity of their students led us to examine the relationship between the factors of students' creativity and the creativity factors of other teachers who come into contact with them during lessons. Research by Dău-Gaspar (2012) confirmed a significantly important relationship between the creativity of teachers and the students they teach. However, in the research we carried out, the connection between the factors of pupils' creativity and the factors of creativity of other teachers was not confirmed. This may be due to the fact that Dau-Gaspar (2012) focused on the creative attitudes of individual actors, and we drew attention to the figural side of creativity. Another reason may be the fact that teachers do not have enough opportunities and time to carry out practical and creative activities during teaching, they cannot give students enough space to be implemented, as they try to provide students with as much information and curriculum as possible. Strict adherence to the curricula that teachers follow can also affect the students themselves. Another problem in today's schools is the fact that in regular classrooms, teachers do not have time to pay more attention to students who are creative and talented. Teachers aim to teach all students and therefore pay more attention to those students who are lagging. As we continue to think about the inconsistency between students' and teachers' creativity, we also consider the possibility that creative students did not want to express themselves creatively so as not to differentiate themselves from other classmates. Herényiová and Smiková (2011) state that students do not like and find it more difficult to accept

classmates who are different. In addition to classmates who are from other social classes, physically handicapped, or classmates with other differences (redhead, freckled, obese). They also more often reject students who are praised by teachers for their results and behavior, ambitious classmates, those who present themselves with a wealth of knowledge, so-called nerds, or classmates who snitch. We can state that in classrooms where similar cases occur, even creative students may feel some concern. Students are often afraid to show their creativity also because they think that their opinions are not good enough, not innovative, and would be ridiculed and misunderstood in the classroom. Given the results of our research, it is possible to conclude our hypothesis no. 1, that the creativity of teachers (not only class teachers) of the 2nd stage of primary school is not related to the creativity of students, and, therefore, we do not accept hypothesis no. 1. Based on our findings, we think it would be appropriate to focus on developing and improving the creativity of not only students but also teachers if we want young people who leave school to be capable of flexibility and full of original ideas. Teachers can bring more fun and interest to the teaching with their creative ideas. They, together with creative tasks, can influence the creativity of the pupils.

### **Research limits**

After carrying out our research, despite our efforts to avoid shortcomings, we noticed several limits.

The first limit of research to be mentioned is the low number of teachers who participated in the research. This was because, for the purposes of our research, we only collaborated with teachers who teach in all five classes, thus contributing to the creation of the school classroom climate and able to evaluate the climate of the classrooms. Due to the small research sample, we cannot generalize our research results to the entire population.

The second limit of research can be considered the research method itself, which we used in data collection. Torrance's figural test of creative thinking is a very popular test, not only among psychologists but increasingly also among educators, which leads to the fact that, unfortunately, it is now often used by teachers themselves for their purposes, so students may recognize the test. This can lead to a distortion of the results found by psychological research, and therefore this may have been reflected in our research.

Another limit may be the current experience of the actors. Before filling in the research methods, we did not find out their health status, or

whether there was a serious quarrel or a demanding paper in the classrooms, which could affect the classroom climate assessment questionnaire in particular.

The fourth limit of research is the fear or unwillingness of some students to cooperate.

### **Future intentions**

In future research, it would be interesting to focus not only on creativity but also on the classroom climate and personality. We would focus our attention on finding relationships and connections between creativity, classroom climate, and personality characteristics. Research points to negative attitudes of students towards highly creative classmates, precisely because of their differences in personality (Hrašnová, 1996; Szobiová, 2004). For this reason, we think that we would get interesting results within school classes by involving the sociometric method. Since our research intended to examine the connections between individual variables, not only for students, we would certainly involve teachers in the research again. It is known that a teacher influences his students with his personality.

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