

## Creativity Development Curve in Slovak Pupils at the Lower Secondary Education Level: Historical-Comparative Study

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### Abstract

The historical-comparative study presents research findings concerning the development of creativity measured by the KREATOS test in pupils of the 5<sup>th</sup> to 9<sup>th</sup> grades at the lower secondary education level (N = 386). The aim was to create the creativity development curve of contemporary pupils in the 5<sup>th</sup> to 9<sup>th</sup> grades of elementary school, where pupils achieved the highest level of creativity in the sixth ( $p \leq 0.001$ ) and then in the ninth grades. Our aim was to compare the current creativity development curve with elementary school pupils' creativity development curves of 1979 and 1985, created by E. Sollarová (1979, 1985) using also the KREATOS test. Our findings indicated a significantly higher level of creativity ( $p \leq 0.001$ ) in pupils in the years 1979 and 1985 as compared to the creativity level in pupils in 2013.

**Keywords:** *creativity, creativity development, creativity development curve, KREATOS test*

### Introduction

Creativity is an ability analyzed by a wide professional educational, psychological and lay public. It is wherever man is, it is a universal attribute of our behaviour, thinking and feeling, our overall being (Zelina, 1997). From the ministers and advisors of education, school, educational and counselling psychologists and teachers themselves to parents, we all talk about creativity development; development of non-cognitive parts of pupil personality, development of creative abilities; development of creative thinking is one of our major goals in personality development. Are we doing it? Is it really so? We can state that with the increased interest

of the wide public creative abilities of our pupils increase, too. This scientific study analyzes creative abilities in pupils at the lower secondary education level with a 30 years' shift in time.

The concept "creativity" comes from the Latin word "creare", meaning produce, give birth to, create, initiate. Systematic research in the field of the psychology of creativity began in the 50s of the last century, following the meeting of the American Psychological Society, where with his lecture on creativity the US psychologist J.P. Guilford responded to the overestimation of the importance of intelligence and criticized the lack of interest in the ability leading to new and inspiring thoughts. He also suggested the direction and methods of research, various modifications and adaptations of which are in use even today.

However, due to its complicated and complex nature, creativity cannot be easily defined or measured, since there are no objective criteria for identifying the level of creativity. Evaluation criteria depend on the individual and on the cultural context of society. So far, the approach to creativity has been reduced to creative, divergent thinking, but M. Jurčová (2002) draws attention to the fact that it is necessary to overcome the exclusiveness of divergent thinking as the cognitive potential of creativity and put more emphasis also on convergent thinking and their interconnectedness. She understands creativity as a complex and dynamic factor of personality, which not only develops but also accentuates personality. In psychology, the concept of creativity is understood in two ways. The longest tradition is that of its narrower understanding, according to which creativity is an elite activity of the chosen talented and gifted (artists, inventors). A wider understanding of creativity looks for creative elements in everyday actions, activities, and many authors (e.g. Jurčová, 2002; Zelina, 2006; Zelinová, 1998; Sollárová, 1985; Lokšová, Lokša, 2001; Hlavsa, Dočkal, 1996 and Torrance, 1988, and others) share the opinion that elements of creativity are present in any activity, even if not providing the same possibilities for its development.

Creativity is a complex process of personality, thus we state that it is not only a matter of abilities and thinking. Creativity as the highest cognitive ability in the hierarchic organization combines in itself all lower cognitive functions and is independent, to a considerable extent, of the influence of heredity (Dočkal, 1996). Closest to the pedagogical understanding is the explanation of creativity as a human intrinsic ability (of various strength and orientation) manifesting itself in the individual's self-realization at formation of something new, which should be developed, preparing space for it and removing obstacles standing in its way (Zelina, 2006; Lokšová, Lokša, 2001) in particular in the educational environment,

which is declared also in the fundamental documents aimed at transformation of education (ISCED 0, 1, 2, 3, 2008).

Differences in creativity are influenced by the individual's motivation, which means that creativity is subject to environmental influences and this ability can be developed by a purposeful intentional educational effort. Researchers (whether the world's ones: Torrance, 1968; Rogers, 1995; Isaksen, 1987 or the Czech and Slovak ones: Hlavsa, 1978; Ďurič, 1985; Jurčová, 2009; Zelina, 2006; Sollárová 1985, Kováč, 1982, and others) found out that individuals do not differ only in the amount, degree, development or level of the ability, but also in the creativity "style", i.e. in the manner in which they present their own creativity. It means that individuals, whose level of creativity is the same, may express their creativity in a different way. At the same time, their creativity can be developed and promoted in the process of education, not only by the personality of the teacher and pupil, but also by specific tasks and situations themselves. However, contemporary research in Slovakia (Salbot, 2007) shows that if the teacher himself/herself is not creative, he/she is not able to influence this personality dimension of the pupil sufficiently, nor develop it.

Already in 1964, E.P. Torrance assumed that creativity had an ascending tendency aligned with the general personality development from 3 to 17 years of age (Szobiová, 1999). However, J. Szobiová (1999) empirically recorded declines in creativity at the age of 5 and in the 4<sup>th</sup>, 7<sup>th</sup> and 12<sup>th</sup> grades of compulsory school attendance. Creativity in the 3<sup>rd</sup>, 5<sup>th</sup>, 6<sup>th</sup> and 8<sup>th</sup> grades was at about the same level. The author explained the creativity declines in the above grades as caused by intervening factors from the outer environment (changes in school conditions upon entering the higher level of education) as well as the developmental tendencies of personality to mould one's own position and identity in society. Creativity development curves were studied also by other psychologists (M. Jurčová, 1983 and E. Sollárová, 1979, 1985) and both authors recorded a decline in the 8<sup>th</sup> grade of elementary school, almost to the level of the 6<sup>th</sup> grade. They observed an increase between the sixth and seventh grades. L. Ďurič (1985) remarked on those results that such curves were not rare and occurred also in the research of several foreign authors (Arasteh et.al., 1968, 1976; Csikszentmihalyi et.al., 1973, 1979; Kogan, et.al., 1972, and others).

## **Research Aim**

Based on the proclaimed principles of education transformation in the Slovak Republic since the end of the 20<sup>th</sup> century, emphasizing the necessity to integrate

creativity into the school curriculum, learning and study programmes and plans, as well as teacher professional competences and the organization of educational facilities itself (State Education Programme, 2001, 2008), we decided to compare the creativity development curve of contemporary pupils at the lower secondary education level with the curves empirically observed by E. Sollárová (1979; 1985) about 30 years ago. We assumed that due to the accentuation of creativity development in Slovak education, the curve of contemporary Slovak pupils would show a shift towards higher creativity values in comparison to the curves of Slovak pupils of the same age 34 and/or 28 years ago.

E. Sollárová conducted two studies aimed at recording the creativity development curve in pupils at the 2<sup>nd</sup> level of elementary school (in 1979 and 1985). In 1979 her research sample consisted of 437 pupils (212 boys and 225 girls) of the 5<sup>th</sup> to 8<sup>th</sup> grades of elementary school. To find out the creativity level, she used the KREATOS test by Schürer to assess total figural creativity (fluency, flexibility and originality) and the Torrance Test of Creative Thinking to record only figural originality. The author recorded no significant differences in creativity between the genders and no significant grade-to-grade differences (Sollárová, 1979). In 1985 E. Sollárová continued her research on creativity development curves using the KREATOS test (figural fluency, flexibility and originality) with 413 pupils of the 2<sup>nd</sup> to 7<sup>th</sup> grades of elementary school. Thus, the aim of our research was using the KREATOS test to record the creativity development curve in contemporary pupils at the 2<sup>nd</sup> level of elementary school and compare it with the development curves recorded by E. Sollárová in 1979 and 1985.

## **Research Method**

The research sample consisted of 386 Slovak pupils (50.26% boys) in the 5<sup>th</sup> to 9<sup>th</sup> grades of nine elementary schools in the region of Banská Bystrica in the 2012/2013 school year. The schools were ordinary state schools and no class was specialized to promote development of specific abilities or used any form of alternative teaching. We strived to get an approximately homogenous sample similar to the sample of pupils in 1979 and 1985 (pupils were selected from medium-size towns with the number of inhabitants up to 30,000 and the representation of the genders was similar). More detailed information about the research sample is presented in Table 1.

We used the performance KREATOS test by M. Schürer (1978), constructed similarly to the Torrance Test of Creative Thinking. It is a projective method

**Table 1.** Characteristics of the research sample

| Grade                 | Gender |       |      |       | Total |       |
|-----------------------|--------|-------|------|-------|-------|-------|
|                       | Girls  |       | Boys |       | N     | %     |
|                       | N      | %     | N    | %     |       |       |
| 5 <sup>th</sup> grade | 44     | 52.38 | 40   | 47.62 | 84    | 21.76 |
| 6 <sup>th</sup> grade | 42     | 53.16 | 37   | 46.84 | 79    | 20.47 |
| 7 <sup>th</sup> grade | 37     | 47.44 | 41   | 52.56 | 78    | 20.21 |
| 8 <sup>th</sup> grade | 38     | 46.34 | 44   | 53.66 | 82    | 21.24 |
| 9 <sup>th</sup> grade | 31     | 49.21 | 32   | 50.79 | 63    | 16.32 |
| Total                 | 192    | 49.74 | 194  | 50.26 | 386   | 100   |

used in counselling and clinical practice for multidimensional diagnostics of teenager personalities. It examines the adequacy and originality of figural solutions, originality of semantic designation of solved tasks, the way in which one's own performance is self-evaluated, interest orientation and drawing skills. It analyzes the level of creativity by means of three factors (fluency, flexibility and originality). The respondent's task is to finish 12 incomplete drawings, give them a title and evaluate each drawing with a mark from 1 to 5. The test administration time is 20 minutes. The authors verified several criteria of the KREATOS test psychometric properties, where the reliability in terms of the test-retest stability in time after 4 weeks was at the level of  $0.52 \leq r \leq 0.71$ . Validity returned also satisfactory coefficients in relation to validation variables from the Eysenck Personality Inventory B-JEPI (neuroticism, extraversion, lie-score), to the pupil's phantasy estimated by the teacher and/or the pupil him/herself and to academic achievement.

Statistical analysis was made by parametric tests because the check of the studied variables for normal distribution by the Kolmogorov-Smirnov test returned normal distribution of the variable creativity ( $p \geq 0.20$ ).

## **Research Results**

The aim of our study was to record the cross-sectional level of creativity, i. e. quasi-longitudinal research, using the KREATOS test with pupils of the 5<sup>th</sup> to 9<sup>th</sup> grades at the lower secondary education level. The average values of the test total score in the studied research sample are presented in Table 2.

**Table 2.** Average values of the creativity total figural scores in the KREATOS test in 2013

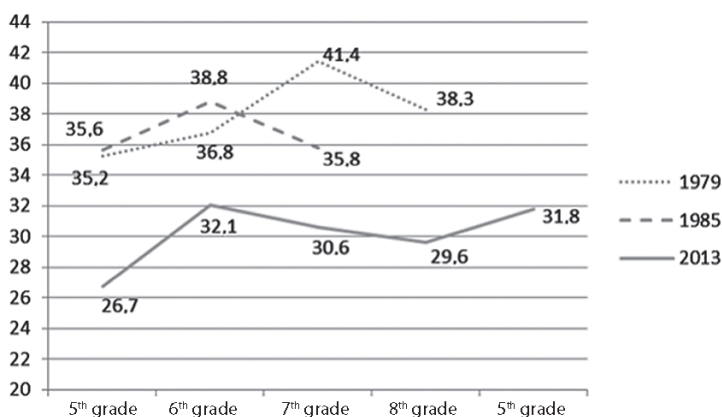
| 2013                  | Grades<br>KREATOS | SD   | Min   | Max   | T    | p             |
|-----------------------|-------------------|------|-------|-------|------|---------------|
| 5 <sup>th</sup> grade | 26.73             | 5.43 | 19.00 | 36.00 | 5.85 | $p \leq 0.05$ |
| 6 <sup>th</sup> grade | 32.05             | 3.48 | 19.00 | 49.00 |      |               |
| 7 <sup>th</sup> grade | 30.57             | 4.67 | 8.00  | 53.00 |      |               |
| 8 <sup>th</sup> grade | 29.58             | 6.78 | 6.00  | 41.00 |      |               |
| 9 <sup>th</sup> grade | 31.80             | 4.89 | 17.00 | 43.00 |      |               |

Based on the ANOVA for more independent samples the existence of significant grade-to-grade differences was proved. Subsequently, the Tukey test (POST HOC) was used to find out which differences between the grades were the most significant. The level of creativity of the pupils at the 2<sup>nd</sup> level of elementary school in 2013 had a growing tendency between the 5<sup>th</sup> and 6<sup>th</sup> grades, with a subsequent decline continuing until the 8<sup>th</sup> grade. It regained the ascending tendency between the 8<sup>th</sup> and 9<sup>th</sup> grades, in the 9<sup>th</sup> grade achieving approximately the level of the 6<sup>th</sup> grade. Calculation of the statistical significance of the grade-to-grade differences returned highly significant differences for the 6<sup>th</sup> and 9<sup>th</sup> grades compared with the 5<sup>th</sup> grade ( $p \leq 0.001$ ) and a significant difference for the 7<sup>th</sup> grade compared with the 5<sup>th</sup> grade ( $p \leq 0.05$ ). We found out that the pupils of the 6<sup>th</sup> grade achieved the highest level of creative abilities measured by the KREATOS test.

Further, in accordance with our research aim, we compared our recorded creativity development curve with the curves observed by E. Sollárová (1979; 1985). The values producing the curve of 1985 had been obtained by averaging three measurements recorded by the author in control groups with no creativity developing programme implemented. The graphic comparison of the creativity development curve is presented in Picture 1, where the obtained raw average score of the pupils of the specific grade is plotted on the Y-axis.

The 2013 development curve has an ascending and descending tendency similar to the development curve of 1985. However, the graphic illustration of the three creativity development curves shows that the pupils achieved the highest creativity level in 1979 and the lowest in 2013. The significance of differences in the creativity level of the contemporary pupils at the 2<sup>nd</sup> level of elementary school compared to the pupils of matching grades 34 and 28 years ago was tested by the one-sample t-test. Results of the statistical analysis are presented in Table 3.

**Picture 1.** Creativity level development curves in 1979, 1985 and 2013



**Table 3.** Differences in the creativity level between contemporary pupils and pupils in 1985 and 1979

| Year | 5 <sup>th</sup> grade |       | 6 <sup>th</sup> grade |       | 7 <sup>th</sup> grade |       | 8 <sup>th</sup> grade |       |
|------|-----------------------|-------|-----------------------|-------|-----------------------|-------|-----------------------|-------|
|      | 1979                  | 2013  | 1979                  | 2013  | 1979                  | 2013  | 1979                  | 2013  |
| AM   | 35.23                 | 26.73 | 36.75                 | 32.05 | 41.4                  | 30.57 | 38.25                 | 29.58 |
| P    | p < 0.001             |       | P < 0.001             |       | p < 0.001             |       | p < 0.001             |       |
| Year | 1985                  | 2013  | 1985                  | 2013  | 1985                  | 2013  |                       |       |
| AM   | 35.63                 | 26.73 | 38.8                  | 32.05 | 35.8                  | 30.57 |                       |       |
| p    | p < 0.001             |       | P < 0.001             |       | p < 0.001             |       |                       |       |

The development curves of 1979 and 1985 achieved higher values of creativity than the creativity level values measured in the pupils in 2013. The statistical analysis shows highly significant differences in the level of creativity for all the observed pupil pair groups, in favour of the contemporary pupils.

## **Discussion and Conclusions**

The creativity development curve of the contemporary pupils at the lower secondary education level was recorded and analyzed. It was found out that the pupils achieved the highest level of creativity in the sixth and ninth grades, which

was a highly significant difference in comparison with the fifth grade pupils who achieved the lowest creativity level from among all the grades. This result corresponds to E. Sollárová's findings of 1985, where the pupils of ordinary 6<sup>th</sup> grades (with no creativity developing programmes) of elementary schools also achieved a higher level of creativity in comparison with the pupils of the fifth and seventh grades. In our research, as well as in the research by E. Sollárová (1979), M. Jurčová (1983) and others, the creativity development curves show a decline in the eighth grade. L. Ďurič (1985) explains this as a certain developmental tendency, the causes of which are yet unknown and the intervening factors of creativity development should be subject to further research.

J. Szobiová (1999) states a decline in creativity in the 7<sup>th</sup> grade, which also corresponds to the creativity curve created on the basis of our data. Since we did not examine input variables determining the selected samples in our research, explanation of the changes in the creativity level requires further research.

Our main finding in relation to the creativity development curve is that the contemporary pupils at the lower secondary education level compared with the pupils of 1979 and 1985 show a highly significant decline in the creativity level compared to the years 1979 and 1985. At the same time, creativity and its development is one of the most important and current topics in the contemporary school. We consider this remarkable and believe that it is this historical-comparative research study that can indicate the actual level of creativity development in contemporary pupils.

As already mentioned above, there are legislative documents about the implementation of creativity in educational reality; nevertheless, we state that there are some reservations and limits in the intended development of creativity at contemporary school. We are aware of the fact that the above findings cannot be widely generalized because of the lower representativeness of the compared research samples; however, they indicate a possible trend. What is remarkable, and a subject for further research, is the fact that even despite a certain reduction made in the subject matter of the curriculum as a result of curriculum transformation (State Education Programme, 2008) there might still be no sufficient space for effective education aimed at the development of key competences with the activation of all cognitive processes including creativity.

We do not deny a possible effect of other negative factors on the significant decline in the creativity level of the contemporary pupils (problems of upbringing in the family, lack of free, unstructured play, over-stimulation of children, confrontation with a rigid and structured environment, increasing negative influence of media, developing creativity only exceptionally). However, we can



see possible solutions in contemporary education, where one of the important and indispensable places in the development of the highest cognitive function is that of the school creative environment with a creative teacher, who is aware of the fact that creativity can be developed in any activity in any person. Thus, a question appears on whether teachers themselves have sufficient knowledge and competences required for the development of creativity, which generates suggestions for further research.

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