



DAROVITOST

OBRAZOVANJE I RAZVOJ

TEMATSKI ZBORNIK RADOVA MEĐUNARODNOG ZNAČAJA

GIFTEDNESS

EDUCATION & DEVELOPMENT

INTERNATIONAL THEMATIC COLLECTION OF PAPERS



mensa
S R B I J E

BEOGRAD 2018

www.mensa.rs

DAROVITOST, OBRAZOVANJE I RAZVOJ

- Tematski zbornik radova međunarodnog značaja -

GIFTEDNESS, EDUCATION AND DEVELOPMENT

- International thematic collection of papers -



mensa
SRBIJE

Novi Sad, 2018.

GIFTEDNESS, EDUCATION AND DEVELOPMENT
International thematic collection of papers

DAROVITOST, OBRAZOVANJE I RAZVOJ
Tematski zbornik radova međunarodnog značaja

Publisher:

Udruženje građana „Mensa Srbije“, Novi Sad, Srbija

For Publisher:

Aleksandra Borović

Editors:

Prof. dr Lada Marinković, Novi Sad, Srbija
MSc Marinela Šćepanović, Sombor, Srbija

Cover Design:

Jelena Volkov

Design and Processing:

Dunja Šašić

Printing:

SaTCIP doo, Vrnjačka Banja

Copies:

200

ISBN: 978-86-80994-05-5



GIFTEDNESS, EDUCATION AND DEVELOPMENT

International thematic collection of papers

DAROVITOST, OBRAZOVANJE I RAZVOJ

Tematski zbornik radova međunarodnog značaja

Reviewers

Prof. dr Lada Marinković, Visoka škola strukovnih studija
za obrazovanje vaspitača, Novi Sad, R. Srbija

Doc. dr Milica Drobac Pavićević, Filozofski fakultet,
Univerzitet u Banjoj Luci, Bosna i Hercegovina

Prof. dr Maja Ružić Baf, Sveučilište Jurja Dobrile u Puli,
Fakultet za odgojne i obrazovne znanosti, R. Hrvatska

Prof. dr Otilia Velišek Braško, Visoka škola strukovnih studija
za obrazovanje vaspitača, Novi Sad, R. Srbija

Doc. dr Violeta Zubanov, Fakultet za sport i turizam- TIMS,
Novi Sad, R. Srbija

dr Nataša Cvejić Starčević, PSTA psihoterapeut, Novi Sad, R. Srbija

Prof. dr Zdravko Živković, Fakultet za ekonomiju i inženjerski
menadžment, Univerzitet Privredna akademija, Novi Sad, R. Srbija

Doc. dr Milena Letić Lungulov, Filozofski fakultet,
Univerzitet u Novom Sadu, R. Srbija

MSc Marinela Šćepanović, Društvo defektologa Vojvodine,
Novi Sad, R. Srbija

CONTENT

Preface	7
Predgovor.	8

SCIENTIFIC PAPERS

Snežana Nišević, Snežana Nikolić, Danijela Ilić Stošović SCHOOL ACHIEVEMENT IN ABOVE AVERAGE INTELLIGENCE STUDENTS	11
Ivona Ninkov, Jovana Vajdić & Kosa Protić ANALYSIS OF THE CONCEPT OF GIFTED STUDENTS' RIGHTS TO INCLUSIVE EDUCATION	24
Marinela Šćepanović & Tanja Kalinić LEGISLATIVE CONDITIONS AND TEACHERS' COMPETENCIES FOR WORK WITH GIFTED STUDENTS IN SERBIA	35
Rada Tadić & Marijana Momčilović SOCIALIZATION OF A GIFTED STUDENT IN A CLASS	48
Lada Marinković PERFECTIONISM IN GIFTED, Does perfectionism have a good face?	64
Lada Marinković WHAT DOES HUMOR HAVE WITH CREATIVITY?	77
Mirjana Nikolić, Željko Nikolić & Veronika Katrina-Mitrović IDENTIFICATION OF EDUCATIONAL NEEDS OF GIFTED STUDENTS FROM SMALLER COMMUNITIES	87
Zdravko Živković & Teodora Živković GAME MODEL - ENCOURAGING CREATIVITY AND INNOVATION	104
Branka Radulović & Maja Stojanović THE MOTIVATION OF GIFTED STUDENTS TO LEARN PHYSICS.	116
Jasna Adamov & Stanislava Olić APPLICATION OF THE SCIENTIFIC METHOD IN TEACHING CHEMISTRY TO THE GIFTED STUDENTS	125

Radoje Pavlović, Mirjana Nikolić & Radovan Grandić SUPPORT TO EARLY MATHEMATICAL GIFTEDNESS IN PRESCHOOL AND IN FAMILY: THE SUGGESTION OF STIMULATIVE PROGRAM	135
---	-----

PROFESSIONAL PAPERS

Marija Lazarević , Boris Teodosijević & Petar Stojiljković EGOGRAM IN HIGHLY OVER-INTELLIGENT PEOPLE	153
---	-----

Valentina Parović & Milena Mihajlović WHAT CAN WE DO WITH WORDS	163
--	-----

Olga Trifunović EDUCATIONAL USE OF TRANSACTIONAL ANALYSIS IN WORK WITH CHILDREN	171
---	-----

Index of Authors	176
----------------------------	-----

PREFACE

International Thematic Collection of Papers 'Giftedness, education, and development', published by the Civic Association 'Mensa Serbia', was prepared parallel to the same-named Second International Conference, which was held in Belgrade from 31st of July to 2nd of August, 2018.

In order to show, define and harmonize procedures, methods and, above all, practice in the field of education of the gifted, the Association "Mensa Serbia" in cooperation with the Preschool Teacher College, Novi Sad, Faculty of Special Education and Rehabilitation-University of Belgrade, the Association of Teachers of Vojvodina, the Society of Vojvodina's Special Educators and Rehabilitators and the National Center for Talents, for the second time start up an initiative aimed to this goal, in the form of Conference as a meeting of experts in the field of education as well as publishing scientific and expert articles.

This year's Thematic Collection of Papers represents papers of domestic authors, focused on the consideration and analysis of several areas of importance for the education of gifted. Presented papers are about different topics, from the model of identification of children and students who are gifted, readiness of teachers for work with gifted children, legal frameworks that support gifted education and conditions to work with gifted, supporting to education of gifted in special areas, innovative programs and procedures for improving work with gifted in specific areas, some personal characteristics of gifted, methods of encouraging creativity, up to professional papers that give examples of work practices with gifted children. The Thematic Collection of Papers consists of eleven scientific and three professional papers, by 28 authors.

Defining the English as the language of communication between authors and professionals in this years' Collection of Papers, makes possible to exchange experiences of experts in the field, from a wider area than local, which in return, we expect will bring broader support, as the visibility of efforts in identification of the gifted in our country, providing them with the better conditions for promotion and development.

We would like to thank everyone who contributed to the content of this Collection of Papers and we expect further involvement of experts at all levels of education in the efforts to care for gifted children and their education to suit their needs and for the benefit of our entire society. Also, we hope that this publication improves the quality and content of communication with all those interested in this topic in regional and international frameworks.

In that intention, we expect the next Collection of Papers already next year. Authors who are inspired to join us we are expecting with joy. We expect constructive comments, suggestions, and reviews from the reading audience of this years' Collection of Papers.

Editors
Prof. PhD Lada Marinković and MSc Marinela Šćepanović
July, 2018

PREDGOVOR

International Thematic Collection of Papers „Tematski zbornik radova međunarodnog značaja“ čiji je izdavač Udruženje građana „Mensa Srbije“, priređen je u povodu održavanja Druge međunarodne konferencije istog naziva u Beogradu od 31. 7. do 2. 8. 2018. godine.

U želji da se prikažu, definišu i usklade procedure, metode i pre svega prakse u oblasti obrazovanja darovitih, Udruženje građana, Mensa Srbije u saradnji sa Visokom školom strukovnih studija za obrazovanje vaspitača iz Novog Sada, Fakultetom za specijalnu edukaciju i rehabilitaciju Univerziteta u Beogradu, Udruženjem vaspitača Vojvodine, Društvom defektologa Vojvodine i Nacionalnim centrom za talente, po drugi put pokreće inicijativu usmerenu ka tom cilju, u vidu susreta stručnjaka iz oblasti obrazovanja i publikovanja naučno stručnih radova.

Ove godine Tematski zbornik odlikuju radovi domaćih autora usmereni na razmatranje i analizu više oblasti od značaja za obrazovanje darovitih, od modela identifikacije dece i učenika koji su daroviti, preko spremnosti vaspitača i nastavnika za rad sa darovitom decom, zakonskih okvira koji podržavaju obrazovanje darovitih i uslova za rad sa darovitima, podrške obrazovanju darovitih u posebnim oblastima, inovativnih programa i procedura za unapređivanje rada sa darovitima u posebnim oblastima, nekih osobina ličnosti darovitih, metodama podsticanja kreativnosti i stvaralaštva, pa do stručnih radova koji daju primere prakse rada sa darovitom decom. Razmatranja su data kroz jedanaest naučnih i tri stručna rada, od strane ukupno 28 autora.

Opređenjenje za engleski jezik kao jezik komunikacije autorskih radova i stručne javnosti omogućava razmenu iskustava u širem prostoru od lokalnog, što zauzvrat, očekujemo, može imati i širu podršku ali i vidljivost napora da u našoj zemlji ostvarimo pravovremenu identifikaciju darovitih i obezbedimo im najbolje uslove za napredovanje i razvoj.

Zahvaljujemo svima koji su doprineli sadržaju ovog Zbornika a nadalje očekujemo veću uključenost stručnjaka na svim nivoima obrazovanja i vaspitanja u nastojanjima da briga o darovitima i njihovo obrazovanje bude primereno njihovim potrebama a na dobrobit čitavog našeg društva. Takođe, nadamo se da ovom publikacijom unapređujemo kvalitet i sadržaj komunikacije sa svima koji su zainteresovani za ovu temu u regionalnim međunarodnim okvirima.

U ovoj nameri očekujemo i naredni Zbornik već u sledećoj godini. Autore koji budu inspirisani da nam se pridruže sa radošću očekujemo. Od čitalačke publike ovog Zbornika očekujemo konstruktivne komentare, sugestije i kritike.

Urednice
Prof. dr Lada Marinković i MSc Marinela Šćepanović
Jul, 2018.

SCIENTIFIC PAPERS

UDC 159.922.7-056.45
Original scientific paper

SCHOOL ACHIEVEMENT IN ABOVE AVERAGE INTELLIGENCE STUDENTS

Snežana Nišević^{ab}, Snežana Nikolić^{ca} & Danijela Ilić Stošović^{ca}

^aResource center „Knowledge“, Belgrade, Serbia; ^bPrimary special school „Boško Buha“, Belgrade, Serbia; ^cFaculty of Special Education and Rehabilitation, University of Belgrade, Serbia

Abstract

Research goal: The aim of this paper is to show to what extent students with high intellectual potential realize high school achievements also. It was analyzed the school success in the second cycle (subject teaching) of the students with above-average intelligence which was established during the younger school age. School success is discussed in relation to the level of achievement in academic skills and motor functioning.

Method: The sample consisted of 61 pupils of both sexes aged 11.3 to 15 years with no neurological deficits, psychiatric disorders, somatic or sensory impairments and intellectual capacity ranging from 112 to 121 assessed by Raven's Colored Progressive Matrices at the age of 7.3 to 11 years. At the same age was determined the quality of writing, reading and computing by the Protocol for the assessment of basic academic skills and the level of motor functioning by the Protocol for the assessment of motor functioning. The school success was established at four years after the first test in the school year 2017/18.

Results: In the overall sample were found 24.6% of the above-average intelligent who achieved maximum school achievements (5.00). At the same time there are 19.7% of those who did not achieve excellent school success and 11.5% of those who achieved mark 3 and lower in some subjects.

Conclusion: In accordance with the results superior intelligence is not a guarantee of high school achievement on its own. In the context of maximizing the potential of above-average intelligent students there is an implicit need for support and additional intervention in different areas in the early years of schooling of these students.

Key words: above-average intelligence, school achievement, support, giftedness

Introduction

Above-Average Intelligence, Giftedness and Its Actualization

The actual concepts of giftedness are based on empirical studies and their beginning are related to the Galton's concept of giftedness as an innate quality that is evolving inspired by inside and which is beyond the reach of external influences (Galton, 1892). Further definitions were predominantly focused on high intellectual potentials and where the measure of giftedness is a high ratio of intelligence as an innate and general ability (Terman, 1916).

More recent definitions of giftedness takes into account intellectual abilities as a condition but they do not consider them sufficient for a full explanation of giftedness. Renculi (1978) determines the giftedness as the interaction of above-average ability, commitment to the task and creativity, whereby above-average ability and creativity can be influenced in childhood and developed according to genetic potential (Rajović and Rajović, 2017). In some definitions successful problem-solving and knowledge acquisition (Sternberg, 2000) are used as indicators of giftedness which are based on the multiple connection of the neurobiological construct with a high level of achievement and abilities and bio-psycho-social status (Heller et al., 2000).

Although divided into those who consider giftedness as extraordinary ability and those who consider as an extraordinary achievement the both categories of modern conceptions of giftedness assign an important role to learning / education processes and environmental conditions (Dai, 2009, Mayer, 2005, Preckel & Vock, 2014, Vock, Gauck & Vogl, 2011, according to Altaras, 2006). In fact, the both are models that show how (extraordinary) potential becomes (extraordinary) achievement.

Giftedness as an innate ability that appears as one in row of domains (intellectual, socially-affective, sensorimotor) does not mean either success in school or success in life by itself. It represents a potential and a latent basis that develops into some manifest form (systematically developed high competencies, knowledge and skills) and achieves maximum potential in addition to encouraging and supporting by the environment (systematic learning and practice) (Gagné, 2015). Altaras Dimitrijević and Tatić Janevski (2016) determine giftedness as "... exceptional ability expressed in extraordinary speed, easily and self-sufficiency by which are acquired knowledge and skills in some area comparing to peers, i.e. people of similar previous experience in a given domain".

Actualization of giftedness and academic failure of gifted students

Learning and education influence to the appearance and development of giftedness although giftedness is not something that (learning and education) can be acquired (Altaras, 2006). Learning and / or education constitute a mechanism and the environmental conditions are the

factors responsible for the actualization of giftedness so that affect whether the giftedness will appear at all. The form of excellence appearance in some scientific, sports or artistic domain at that moment (actualization of giftedness) is greatly an expression of learning and exercise processes (the interaction of factors that promote or inhibit the mentioned processes) but not a direct reflection of genetic predispositions. The role of the education system and teachers is to enable students to continuously expand the repertoire of possible operations or activities and thus give a chance to students to achieve excellence, i.e. to show itself as gifted (Ziegler, 2005).

On the other hand to the actualization of the ability of gifted students there is a problem of their academic failure. The essence of this problem is the clash between students exceptional abilities and their performance at school. Possible decline in the educational achievements of gifted students and much less achievement than the student might have is a serious problem that has been more prevalent in recent decades (Clemons, 2008).

School achievement

The assumption and main determinants of school success according to Oros et al. (2017) are classified into three categories: cognitive, non-cognitive and external factors. Cognitive factors include the cognitive abilities of the child. Authors cite studies that confirm the children of higher intellectual capacity achieve better school success (Leeson, Ciarrochi, Heaven, 2008). The child's motivation for learning is highlighted as the most important non-cognitive factor (greater intrinsic motivation for learning and adopting curriculum leads to better learning and better school success) as stated studies by the Deci & Ryan (2000) and Lepper et al. (2005). External factors are beyond the child (school, family etc.) Stimulative environment is necessary for a better children's school success. In school context that means the school atmosphere and method of transferring knowledge to students influence to the level of acquiring new knowledge. There are data in literature about different effects of external motivation on different children's ages (Lemos & Verissimo, 2014; Corpus & Worthington, 2014).

The aim of this paper is to show to what extent students with high intellectual potential realize high school achievements also. There was discussed the problem in kontekst of school environment and giftedness actualization and its failure in above-average intelligence students. It was analyzed the school success in the second cycle (subject teaching from fifth to eighth grade) of the students with above-average intelligence which was established during the younger school age (from the first to fourth grade in primary school). School success is discussed in relation to the level of achievement in academic skills and motor function. The intention of the research was to emphasize the importance and necessity for additional (systemic) intervention toward students with high intellectual potential because make a possibility to establish their (extraordinary) potentials.

Method

Participants

The sample in this study consisted of 61 pupils fifth to eighth grade in primary school both sexes aged 11.3 to 15 years with no neurological deficits, psychiatric disorders, somatic or sensory impairments and intellectual capacity ranging from 112 to 121 assessed by Raven's Colored Progressive Matrices at the age of 7.3 to 11 years.

Two groups of above/average intelligence students participated: 45 (16 boys and 29 girls) highly intelligent students -IQ 112 to 117 and 16 (6 boys and 10 girls) intellectually superior students -IQ 118 and more, (Table 1). In the highly intelligence group the highest number of students was at the second/sixth and fourth/eighth grades and while in the group of superior students the highest number was at the first / fifth grade. Such distribution in the context to the educational level (school grade) can be attributed to the influence of individual differences or characteristics of the instrument used for evaluation and it would be interesting to analyze in some future research. Mean age in the highly intelligent group was 111.4 and in the group of superior 98.8 months with a statistically significant intergroup difference (Table 2). In group of highly intelligent mean IQ is 114 and in group of superior it was 119.3 with statistically significant intergroup difference.

Table 1. Distribution in Two groups and Total sample according to school grade

School grade	Highly intelligent (IQ 112-117) (n=45)		Intellectually superior (IQ 118 and more) (n=16)		Total sample (n=61)
	N	%	N	%	N
I / V	8	44,4	10	55,6	18
II / VI	19	86,4	3	13,6	22
III / VII	5	62,5	3	37,5	8
IV / VIII	13	100,0	0	0,0	13
Total	45	73,8	16	26,2	61

Tests and Materials

Intelligence

Assessment of general abilities in order to determine the students' intellectual capacities was carried out by Raven progressive color matrices according to local test standards (Fajgelj, 2007) at the age of 7.3 to 11 years. The test is intended for children aged five to eleven. It consists of 36 tasks

divided into three series (A, AB, B). The total number of correct answers is running out. The results were scored as intellectually superior (total score above 90% for the age group) and highly intellectual abilities (score above 75% for the age group). The instruction was given in group and two test tasks were solved. Afterward the students solved the test individually.

Basic academic skills and motor functioning

Clinical assessment of basic academic skills

In order to determine the quality of basic academic skills was used the Protocol for the assessment of basic academic skills in the domain of writing, reading and calculation and was observed in aspects of speed, accuracy and fluency. The scores used were the age/related norms according to Nišević (2016). Total scores on separated scales for writing (WRIT), reading (READ) and computing (COMP) represent the overall performance for each academic skill in particular. Performances are rated as an achievement that corresponds to age (average performance for age), as an achievement that deviates 1 and 2 SD below the age average (indicate the elements of writing, reading and computing disorders or indicate the existence of developmental disorders in these domains) and as an achievement that deviates 1 or 2 SD above the age average (indicate high or extraordinary performance in observed domains).

Clinical assessment of motor functioning

In order to determine the level of motor functioning was used the Protocol for the assessment of motor functioning in the domain of neuromaturation, praxis and movement execution, somatosensory and sensorimotor organization and general motor skills with age-related norms according to Nišević (2016). The score on the overall motor performance scale (OMF) represents a motor performance and is rated as an achievement that corresponds to age (average performance for age), as an achievement that deviates 1 and 2 SD below the age average (indicate the elements of motor disorder or manifested developmental coordination disorder) and achievement that deviates 1 or 2 and above SD above the age average (indicate high or extraordinary motor performance).

School achievement

School achievement was evaluated four years after the first test and based on data from school documentation at the end of the first semester of the current school year. Achievements-success is ranked in five levels: 5-extraordinary (excellent success all marks was five-mean 5.00), high achievement (excellent success two marks was four -mean 4.80 to 4.99), excellent (excellent success more than two marks was four -mean 4.50 to 4.79), low excelent (excellent success in some school subjects mark was three or less - at risk to failure), below excellent (not achieved excellent success - signed failure).

Provided support

Data of the type of support provided to students was obtained from pedagogical documentation of teachers, psycho-pedagogical service of the school and parents by filling out the Parents' Questionnaire. Three forms of professional support are highlighted: support in teaching process-individualization procedures (additional and supplementary education at school), support for abilities development (defectological rehabilitation), support outside the school in the parents' arrangement (additional programs in the local community according to students' interests).

Procedure

The research is part of a wider research study on the presence of a developmental coordination disorder in lower-grade primary school students approved by the University of Belgrade Faculty of Special Education and Rehabilitation. It was conducted at a primary school in Belgrade as a prospective study. The sample was formed on the basis of data collected from school documentation and with the consent and participation of parents. The same student sample was tested twice by the research team. The first testing was carried out at the younger school age (7.3-11 years). At the same age was also determined the quality of writing, reading and calculating and the level of motor functioning. Second testing was conducted four years after the first testing at the senior school age at the school year 2017/18. Then the school success of the same students was analyzed.

Results and Discussion

One-way variance analysis (ANOVA) was used to determine the intergroup differences in achievement at the first test for all diagnostic domains in samples of different intellectual capacities (Table 2). Intergroup differences in a monitored domain was not statistically significant. In the domain of writing ($M = 5.6$) and motor functioning ($M = 39.2$) those from the group with lower intellectual capacity (higher intelligence group) showed better mean achievements than the mean of Total sample ($M = 5.5$; $M = 38.5$). So, the group of superiors unexpectedly did not achieve better results and neither group did achieve maximum achievement. Such results indicate a lower motor function in students with higher intellectual potentials considering that the writing tasks included the motor component to a greater extent than the orthographic (linguistic). In accordance with these, Nišević et al. (2017) showed a highly statistically significant correlation between IQ and motor functioning.

Table 2. Means of the Two groups and the Total group on Descriptive measures and Diagnostic domains (first testing)

Measures and domains	Highly intelligent (IQ 112-117) (n=45)		Intellectually superior (IQ 118 and more) (n=16)		F (1,59)	η^2	Total sample (n=61)			
	M	SD	M	SD			M	SD	Min	Max
AGE	111,4	13,7	98,8	9,2	11,5***	,16	108,1	13,8	88,0	135,0
IQ	114,0	1,5	119,3	1,4	159,4***	,73	115,4	2,8	112,0	121,0
READ	5,7	,5	5,8	,6	,1	,00	5,7	,5	4,0	6,0
WRIT	5,6	,7	5,1	1,2	2,9	,05	5,5	,9	2,0	6,0
COMP	5,8	,3	5,8	,5	,1	,00	5,8	,4	4,0	6,0
OMF	39,2	4,5	36,6	7,4	2,9	,05	38,5	5,5	20,0	48,0

***p<,001; **p<,01; *p<,05.

AGE-age in months; IQ-intelligence quotient; READ-reading; WRIT-writing; COMP-computing; OMF-motor functioning.

Table 3. School achievement in Two groups and Total sample at age 11,3 to 15 (second testing)

School achievement	Highly intelligent (IQ 112-117) (n=45)		Intellectually superior (IQ 118 and more) (n=16)		Total sample (n=61)	
	N	%	N	%	N	%
1-below excelent	8	17,8	4	25,0	12	19,7
2-low excelent	7	15,6	0	0,0	7	11,5
3-excelent	8	17,8	3	18,8	11	18,0
4-high achievement	11	24,4	5	31,3	16	26,2
5-extra-ordinary	11	24,4	4	25,0	15	24,6
Total	45	100,0	16	100,0	61	100,0

The analysis of student achievement after four years from the first testing at the age of 11.3 to 15 is presented in Table 3. In the total sample 50.8% of the students achieved high and extraordinary academic success. Its was found 24.6% of the above-average intelligence students to achieve maximum school achievements (5.00) with approximately equal representation in both groups. At the same time there were 31.2% of those who

were signed as failure or were at risk of failure and among them 19.7% did not achieve excellent results and 11.5% achieved in some school subjects mark three and below. Failure was more manifested in superior group (25.0%) and the risk of failure in high-intelligence group (15.6%). Similar results we can find in the literature. The frequency of expression failure of gifted according to Clemons (2008) are ranged from 15-40% or even 50% in the population of intellectually gifted students.

Table 4. Academic skills and Motor Functioning in Two groups and Total sample and School achievement at age 7,3 to 11(first testing)

	AS+OMF	School achievement					Total		
			1	2	3	4		5	
Highly intelligent (IQ 112-117) (n=45)	below average	N	2	2	/	/	/	4	
		%	50,0	50,0	/	/	/	100,0	
	average	N	2	2	3	4	4	15	
		%	13,3	13,3	20,0	26,7	26,7	100,0	
	above average	N	3	3	5	6	6	23	
		%	13,0	13,0	21,7	26,1	26,1	100,0	
	MIX	N	1	/	/	1	1	3	
		%	33,3	/	/	33,3	33,3	100,0	
	Intellectually superior (IQ 118 and more) (n=16)	below average	N	2	/	1	0	0	3
			%	66,7	/	33,3	0,0	0,0	100,0
average		N	1	/	/	/	1	2	
		%	50,0	/	/	/	50,0	100,0	
above average		N	/	/	2	5	3	10	
		%	/	/	20,0	50,0	30,0	100,0	
MIX		N	1	/	/	/	/	1	
		%	100,0	/	/	/	/	100,0	
Total sample (n=61)		below average	N	4	2	1	/	/	7
			%	57,1	28,6	14,3	/	/	100,0
	average	N	3	2	3	4	5	17	
		%	17,6	11,8	17,6	23,5	29,4	100,0	
	above average	N	3	3	7	11	9	33	
		%	9,1	9,1	21,2	33,3	27,3	100,0	
	MIX	N	2	/	/	1	1	4	
		%	50,0	/	/	25,0	25,0	100,0	

Considering the achieved results, the question arises whether the students who were failure had lesser achievements in academic skills and motor functioning - AV and MF (Table 4). Achievements on assessing AV+MF were ranked as below average (in one and / or more domains under average and in other domains average achievement), average (in all observed domains average achievement), above average (in one and / or more domains above average and in the other domains average achievement) and mixed (MIX- in some of the observed domains below and in some above-average achievement).

In total sample were found seven students with below average-achievement for academic skills and motor functionality - AV and MF (four in the group of highly intelligent and three in the superior group). These students did not achieved high or extraordinary academic success. It can indicate the existence of learning disabilities. Also, were found four students who show at the same time below average and above-average achievements in different observed domains. In these students we can search for learning disabilities, too. The intergroup difference was not significantly but the one-way variance analysis showed a statistically significant intergroup difference in the total sample compared to the school success achieved ($F = 4.66$, $df_1 = 3$, $df = 57$, $\eta^2 = .20$) between the group of below average and groups of average ($p = .04$) and above-average ($p = .007$). There is an important question to what extent would be students with learning difficulties use intellectual potential to overcome difficulties and maximize own potential if they get adequate support at early school age.

The average achievement for AV and MF showed 17 students (52.9%) and they achieved high (23.5%) and extraordinary (29.4%) school success.

Above/average performance of AV and MF established 33 students (60.6%) and they achieved high (33.3%) and exceptional (29.4%) success, while 13 students achieved lower school performance (9.1% not achieved excellent results, 9.1% achieved a poor performance with a score of three in some cases, 21.2% achieved only excellent success). Higher manifestation of worse results was found in a group of highly intelligent compared to a superior. In support of our results we find results of Rayneri et al. (2006) which state that the discrepancy between ability and achievement is even greater if the abilities are more remarkable.

The results of our study about discrepancy between pupil's extraordinary abilities and their performance at school may be result of discrepancy or conflict interaction between the individual characteristics (needs / qualities) of a gifted student, on the one hand, and the characteristics of the environment (family and school) in which student would realize some achievement, on the other hand. According to Whitmore (1980) failure is not only the result of individual "problems and disadvantages" which student carry to school but also school and classroom climate, material and curriculum, wrong approach and teachers' expectations, lack of recognition of giftedness. According to many authors the lack of challenges in school is contributed by the occurrence of failures (Reis et al., 1995; Díaz, 1998; Hébert, 2001). Altaras Dimitrijević and Tatić Janevski (2016) discuss two reasons for failure of gifted students: the abandonment and loss of motivation when the task is not suitable to the student; and the second

reason to lull gifted in the experience of competence and depriving the opportunity to improve the skills necessary to achieve extra high success. Such a discussion suggests the need for an adequate and appropriate school environment for gifted children.

Table 5. Type of support in above/average intelligent students on younger school age

Type of support		Highly intelligent (IQ 112-117) (n=45)	Intellectually superior (IQ 118 and more) (n=16)	Total sample (n=61)
Support in school/class	Additional education/teaching	1	0	1
	Individualization	1	1	2
	Supplementary education/teaching	25	6	31
	Development rehabilitation	1	2	3
Support outside of school	Sport, recreation	14	5	19
	Music	1	1	2
	Foreign language	1	0	1
	Dancing	1	2	3
	Acting	2	0	2
More than one support	9	1	10	
Total	45	16	61	

In the context of the presence and type of support for above-average intelligent students (Table 5) by the analysis of the results were separated three forms and types of support: support in teaching-individualization procedures (additional and supplementary education at school), development support (defectological rehabilitation), support outside the school in parent's arrangement on programs in the local community according to students' interests). The most students were included in the program of additional classes in the school (31 pupils) and some sports activity - mostly recreational (14 students). There was also a record for one student for whom supplementary classes were organized and for two individualisation in the class. These students have learning disabilities. Three students were involved in the development rehabilitation program due to behavioral problems and motor functioning. We did not find anyone for whom IEP was developed in the period of the younger school age. In

practice at an older age students get enrichment of teaching through additional teaching according to their interests and exceptional abilities. It was identified no one of student which was especially and systematically monitored as gifted.

These results point to the conclusion that there is a lack of additional (system) intervention towards pupils with above-average intellectual potentials. In practice, much attention is paid to students who are less advanced than gifted and advanced students, although it is known importance of stimulative programs at an earlier (school) age and their greater effect.

Conclusion

In accordance with the results superior intelligence is not a guarantee of high school achievement on its own. Among above-average intelligent students were those who manifested under-achievement in academic skills reading, writing and computing as well as lower motor function in addition to their exceptional intellectual capacities.

High and extraordinary school achievement was accomplished by half of total sample students. At the same time one third was failure or at risk of failure. More often failed superior ones while at the risk of failing to a greater extent were group of highly intelligent students. The possible decline in the educational achievements of gifted students and much less achievement than what a student can have is a serious problem. Discrepancy between student's (extraordinary) ability and its performance in school is largely the result of discrepancy and conflict interaction between the individual characteristics of gifted student, on the one hand, and the characteristics of the (school) environment in which he needs to realize some achievement, on the other. Speaking about the educational context, there is a clear lack of additional system intervention towards students with above-average intellectual potentials. In the context of maximizing the potential of above-average intelligent students, there is an implicit need for support and additional intervention in different areas in the early years of schooling of these students.

References

- Altaras, A. (2006). *Darovitost i podbacivanje*. Pančevo-Beograd: Mali Nemo, Institut za psihologiju i Centar za primenjenu psihologiju.
- Altaras Dimitrijević, A., Tatić Janevski, S. (2016). *Obrazovanje učenika izuzetnih sposobnosti: naučne osnove i smernice za školsku praksu*. Zavod za unapređivanje obrazovanja i vaspitanja, Beograd.
- Clemons, T. L. (2008). *Underachieving gifted students: A social cognitive model*. (Research Monograph 08234). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.
- Corpus, J. H. & Wormington, S. V. W. (2014) Profiles of Intrinsic and Extrinsic Motivations in Elementary School: A Longitudinal Analysis. *The Journal of Experimental Education*, 82:4,480-501, DOI: 10.1080/00220973.2013.876225
- Dai, D. Y. (2009). Essential tensions surrounding the concept of giftedness. In L. Shavinina (Ed.), *International handbook on giftedness* (pp. 39-80). New York: Springer Science.

- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227-268. http://dx.doi.org/10.1207/S15327965PLI1104_01
- Díaz, E. (1998). Perceived factors influencing the academic underachievement of talented students of Puerto Rican descent. *Gifted Child Quarterly*, 42 (2), 105-122.
- Фажељ, С., Бала, Г., Тубић, Т. (2007): Равенове прогресивне матрице у боји – основна мерна својства и норме. *Психологија, Вол. 40 (2)*, стр. 293-308.
- Galton, F. (1892). *Hereditary genius: An inquiry into its laws and consequences*. London: Macmillan.
- Gagné, F. (2015). Academic talent development programs: a best practices model. *Asia Pacific Education Review*, 16(2), 281-295. DOI: 10.1007/s12564-015-9366-9
- Hébert, T. P. (2001). „If I had a notebook, I know things would change“: Bright underachieving young men in urban classrooms. *Gifted Child Quarterly*, 45 (3), 174-194.
- Heller, K.A., Monks, F.J., Sternberg, R.J., Subotnik, R.F.(2000). *International handbook of giftedness and talent*; second edition. Oxford, Elsevier Science Ltd.
- Leeson, P., Ciarrochi, J., & Heaven, P. C. L. (2008). Cognitive ability, personality, and academic performance in adolescence. *Personality and Individual Differences*, 45(7), 630-635. <http://dx.doi.org/10.1016/j.paid.2008.07.006>
- Lemos, MS., Verissimo, L (2014). The relationships between intrinsic motivation, extrinsic motivation, and achievement, along elementary school. *Procedia Social and Behavioral Sciences* 112: 930-938.
- Lepper, M., Corpus, J., & Iyengar, S. (2005). Intrinsic and extrinsic motivational orientations in the classroom: Age differences and academic correlates. *Journal of Educational Psychology*, 97, 184-196.
- Mayer, R. E. (2005). The scientific study of giftedness. In R. J. Sternberg & J. E. Davidson (Eds.), *Conceptions of giftedness* (second edition, p. 437-447). New York: Cambridge University Press.
- Nišević, S. (2016): *Bazične akademske veštine kod dece sa razvojnim poremećajem koordinacije*. Doktorska disertacija. Beograd: FASPER.
- Nišević, S., Nikolić, S., Ilić Stošović, D. (2017). Motoričko funkcionisanje dece sa natprosečnom inteligencijom. U Šćepanović M. (ur.), *Darovitost prepoznavanje i podrška*. Tematski zbornik radova međunarodnog značaja, str. 40-52. Mensa Srbije, Novi Sad.
- Oros, M., Mratinković, A., Zotović, M. (2017). Razlike uspešnih i manje uspešnih učenika osnovne škole. U Šćepanović M. (ur.), *Darovitost prepoznavanje i podrška*. Tematski zbornik radova međunarodnog značaja, str. 53-66. Mensa Srbije, Novi Sad.
- Preckel, F. & Vock, M. (2014). *Hochbegabung. Ein Lehrbuch zu Grundlagen, Diagnostik und Fördermöglichkeiten*. Göttingen: Hogrefe.
- Rayneri, L. J., Gerber, B. L., & Wiley, L.P. (2006). The relationship between classroom environment and the learning style preferences of gifted middle school students and the impact on levels of performance. *Gifted Child Quarterly*, 50 (2), 104-118.
- Rajović, R., Rajović, I. (2017). Razvoj darovitosti u vrtiću i školi. U Šćepanović M. (ur.), *Darovitost prepoznavanje i podrška*. Tematski zbornik radova međunarodnog značaja, str. 126-131. Mensa Srbije, Novi Sad.
- Reis, S. M., Hébert, T. P., Díaz, E. P., Maxfield, L. R., & Ratley, M. E. (1995). *Case studies of talented students who achieve and underachieve in an urban high school* (Research Monograph 95120). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.
- Renzulli, J. S. (1978/2011). What makes giftedness? Reexamining a definition (reprint). *Phi Delta Kappan*, 92 (8), 81-88.
- Sternberg, R. J. (2000). Giftedness as developing expertise. *International handbook of giftedness and talent*, 2, 55-66.
- Terman, L. (1916): *The measurement of intelligence*. (U.S.A. Houghton Mifflin Company). The Riverside Press Cambridge. dostupno na http://psyaanalyse.com/pdf/ THE_MEASUREMENT_OF_INTELLIGENCE.pdf
- Vock, M., Gauck, L. & Vogl, K. (2011). Diagnostik von Schulleistungen und Underachievement. In: F. Preckel, W. Schneider & H. Holling (ed.), *Diagnostik von Hochbegabung* (p.1-17). Göttingen: Hogrefe.

- Whitmore, J. R. (1980). *Giftedness, conflict, and underachievement*. Boston: Allyn and Bacon.
- Ziegler, A. (2005). The actiotopemodel of giftedness. In: R. J. Sternberg & J. E. Davidson (ed.), *Conceptions of giftedness* (second edition, p. 411-436). New York: Cambridge University Press.

ŠKOLSKI USPEH UČENIKA SA NATPROSEČNOM INTELIGENCIJOM

Snežana Nišević^{a,b}, Snežana Nikolić^{c,a} & Danijela Ilić Stošović^{c,a}

^aResursni centar „Znanje“, Beograd, Srbija; ^bOŠ „Boško Buha“, Beograd, Srbija

^cFakultet za specijalnu edukaciju i rehabilitaciju, Univerzitet u Beogradu, Srbija

Abstrakt

Cilj: Cilj rada je da prikaže u kojoj meri deca sa visokim intelektualnim potencijalima ostvaruju i visoka školska postignuća. Analiziran je školski uspeh u predmetnoj nastavi učenika kod kojih je utvrđena nadprosečna inteligencija tokom mlađeg školskog uzrasta. Školski uspeh je diskutovan u odnosu na nivo postignuća u akademskim veštinama i motoričkom funkcionisanju.

Metod: Uzorak je činio 61 učenik oba pola uzrasta 11.3 do 15 godina bez neuroloških deficita, psihijatrijskih oboljenja, somatskih ili senzornih oštećenja i intelektualnih kapaciteta od 112 do 121 procenjenih Ravenovim progresivnim matricama u boji, na uzrastu 7.3 do 11 godina. Na istom uzrastu utvrđen je i kvalitet pisanja, čitanja i računanja Protokolom za procenu bazičnih akademskih veština i nivo motoričkog funkcionisanja Protokolom za procenu motoričkog funkcionisanja. Školske 2017/18, nakon četiri godine od prvog testiranja, analiziran je školski uspeh ovih učenika.

Rezultati: U ukupnom uzorku pronađeno je 24,6% nadprosečno inteligentnih koji ostvaruju maksimalna školska postignuća (5,00), ali istovremeno i 19,7% onih koji ne postižu ni odličan uspeh i 11,5% onih koji u nekim nastavnim predmetima ostvaruju ocenu 3 i niže.

Zaključak: U skladu sa rezultatima, nadprosečna inteligencija sama po sebi nije garancija visokih školskih postignuća. U kontekstu maksimalnog ostvarivanja potencijala nadprosečno inteligentnih učenika, implicitna je potreba za podrškom i dodatnom intervencijom u različitim oblastima u početnim godinama školovanja ovih učenika.

Ključne reči: natprosečna inteligencija, školski uspeh, podrška, darovitost

UDC 376.1-056.26/.36-056.45

159.928.23-056.45

Review paper

ANALYSIS OF THE CONCEPT OF GIFTED STUDENTS' RIGHTS TO INCLUSIVE EDUCATION

Ivona Ninkov, Jovana Vajdić & Kosa Protić

Association "Rights4All", Novi Sad, Serbia

Abstract

This paper presents a comparative overview of legal instruments regulating the rights of gifted students from various legal systems, including both Continental and Anglo-Saxon Law. Moreover, the paper aims to illustrate how the rights of gifted children are regulated in Bosnia and Herzegovina, Croatia, Serbia, the Netherlands, Germany, Turkey, Austria, Denmark, Hungary, the United States and the United Kingdom. Also, this paper addresses the concept of the rights of gifted students to inclusive education in the legal acts of the Republic of Serbia, with a terminological clarification of the concept of inclusive education in different countries, such as the United States, Great Britain, Turkey, and the Netherlands. The authors used a comparative method, focused on Continental and Anglo-Saxon Legal systems. The aim of the paper is to show that inclusive education can also be applied to gifted children, although prevailing opinion in most countries is that the concept of inclusive education primarily refers to children with special needs. During the drafting process of this scientific paper, the authors came up with a conclusion that it is possible to apply the inclusive education approach to the gifted, as a contemporary social phenomenon.

Keywords: rights of the gifted, inclusion, legal systems, education.

Introduction

One of the most important basic human rights is the right to education. Thanks to this human right, we are able to understand the world around us, explain different phenomena and express our interests. In order to explain the syntagm 'the right to education' as precisely as possible, we need to take a look at Article 26 of the Declaration on Basic Human Rights (1948), and Article 5 of the Convention against Discrimination in Education (1960). Here, it is clearly and concisely explained that education should be free, compulsory, and available to all, under equal con-

ditions. Education should focus on the full personality development and strengthening the respect for human rights and fundamental freedoms. As it is known, human rights are primarily universal moral norms that bind all people on the planet; consequently, we observe them through the prism of internationally recognized conventions that legally grant these rights (Gordon, 2013).

In the first part of the paper, the term “gifted children” is used as it applies to particular countries. After that, an overview of legal acts regulating the rights of gifted students within various legal systems is given. The second part of the paper addresses an interpretation of the concept of inclusive education in the Republic of Serbia, as well as the comparison of the definition of the concept of inclusion in the United States, Great Britain, Scotland, Turkey and the Netherlands. Final considerations are provided at the conclusion of this paper.

In the widest sense, the principles of education rest on the idea that children should be provided with all resources necessary to fulfill their dreams (Hodges, Tay, Naeda, & Gentry 2018). Applying the logical interpretation, education should meet numerous and various needs students usually have. According to abovementioned, educators should have both professional and moral obligation to provide students with various stimuli, and to be able to meet diverse needs of students who show signs of giftedness during early development. When referring to giftedness, there are different theoretical perceptions and doubts on the term and concept itself. Namely, Terman, as one of the pioneers in this field, and he considers students who rank within the top 1% on standard intelligence tests to fall under the “gifted” category (Ameroglu, Sarikaya, Daglioglu, Kilic, & Cakmak, 2017).

This interpretation started to fall out of favor during the mid-20th century, when it was believed that the determination of intelligence, as kind of a guideline for revealing the degree of giftedness, cannot be subordinated to standardized tests.

Furthermore, based on the Marland Report (1972), gifted children were defined as: “Children who perform well in one or more of these six areas, including general mental ability, special ability in a certain academic field, creative and productive thinking, leadership ability, talent in visual performing arts, and psychomotor ability.”

According to Woods (2016), gifted and talented children are defined as children who are distinguished from their peers by their general and/or special abilities.

Gifted children are rare, while the adults’ ability to perceive giftedness is often pretty limited. In a majority of cases, it is difficult to recognize gifted children; even when they are perceived as such, parents and teachers often do not know how to develop and improve the innate giftedness of the child in the best possible way (Kelemen, 2018). At the first glance, it is quite easy to recognize giftedness in the fields of art, music and sports. These categories enjoy benefits of sports classes, arts and music schools, where classes are organized. The alarming issue is that there are other gifted children who do not demonstrate these clearly visible talents, but who require an active and planned strategy for the emergence of their particular gifts.

More importantly, giftedness and talent are not static categories, but rather continuous processes created as a result of the interaction of different factors, such as individual predispositions, one's ability to influence his/her own development, and the influence of upbringing (Ozcan, & Gunduz, 2016). Quiet often, educational support for gifted children is neglected by inertia, since it is considered that these children already differ from their peers, and additional stimulus is not necessary. Giftedness implies high degree of individual achievements in specific areas, in comparison to child's peers.

According to all abovementioned, it is necessary to provide gifted children with full support up to the maximum when developing their capacities. The reason for this ground is that a tremendous advantage over others can easily be turned into a disadvantage, especially when the label of a "special needs" child is given to these children, due to an inadequate awareness of the importance of fostering such a gift or talent.

Work Methodology

The authors used a comparative method while writing this paper. Also, the authors believe it is not possible to form and base the opinion and ground on the legal aspects of inclusive education for gifted children without the comparative research. The subject of the research is the similarities and differences of the rights of gifted and inclusive education observed through various legal systems.

Results and Discussion

An adequate education policy and legal regulations are foundations of the development of gifted children and adults. Each country individually needs to find suitable measures and a manner of enabling the development and empowerment of gifted children, in accordance with specific abilities, talents and needs every gifted child have.

It is widely known that the education of the gifted, as well as their general status in the education system, is one of many burning issues. Bearing this in mind, as well as aspirations of a modern state and society that thinks about its future, we need to comprehend that there are no clear legal guidelines, measures and action plans for the education of gifted students both in our country and the region.

To illustrate this, the Framework Law on Primary and Secondary Education in Bosnia and Herzegovina (2003) has guidelines for the education of children with special needs, and does not recognize gifted students as a category at the same time. Article 4 of the Framework Law on Primary and Secondary Education of Bosnia and Herzegovina stipulates that every child has the same right to access and equal opportunity to appropriate education without any discrimination. The Law on Education in Elementary and Secondary School in the Republic of Croatia (2017), recognizes the category of gifted students, instructing schools to monitor and encourage these stu-

dents through additional assignments according to their preferences, abilities and interests, as more precisely defined by the Ministry of Education.

According to the Law on the Foundations of the Education and Upbringing System of the Republic of Serbia (2017), as the part of the pre-school, primary and secondary education systems framework, as well as adult education, special attention is paid to work with gifted children. Thus, Article 3 of the aforementioned law stipulates that persons with exceptional abilities have the right to education and upbringing with the respect to their special educational and upbringing needs, in terms of special classes or special schools, in accordance with this and other specific laws. Furthermore, Article 56 provides the possibility of organizing individual programs for exceptional students, both at the elementary and secondary levels of education. In addition, according to the Law on the Basis of the system of education and training, the educational institution can adapt the school program to students who achieve outstanding results in the field of education, which includes adoption of an individual educational plan. This plan is a special act aimed to satisfy educational needs of the child and the student. It is endorsed by the pedagogical collegium of the institution, to the suggestion for the inclusive education, ie the team for providing the additional support to the children and students and consists of a teacher, professional associate, associate, parent or other legal representative. According to Article 76 the IOP3 is aimed at deepening and expanding the content of educational activities of children with exceptional abilities.

Even though we consider Western European countries as these with more modern or advanced approach to a number of fields in economy, social policy, and education; while researching educational models in Netherlands, we came up with a conclusion that this is usually not the case. Namely, the education system in the Netherlands is quite good because it relies on a "broad middle group" so that there is no clear student selection - very "weak", less capable, or struggling on the one hand, and the gifted, highly advanced or excellent students, on the other. Also, this fact comes from the national creed (Greet, Minnaert, & Kamphof, 2013, p. 134): "Do not stand out" and "Good is good enough".

However, we often encounter the situation when students are not parted according their ability level, and teachers themselves were not "gifted students" back then in their early education process. In other words, a group of gifted students emerges, being superior to their (average) teachers, both in intelligence, way of thinking and metacognitive skills, which leads to a disagreement between students and teachers (Greet, Minnaert, & Kamphof, 2013, p. 135).

The Ministry of Education, Culture and Science of the Netherlands went an extra mile, overcoming the inclusion of gifted students and possibly gravitated towards positive discrimination in manner of segregation. To illustrate, the Ministry developed plans and measures, and founded schools with gifted educational profile and plan, and schools with the Leonardo concept (school-within-a-school).

Although the idea was fantastic, it had different outcome in practice. One of the most pronounced problems was that the teachers did not recognize the number of gifted students as critical. Moreover, there was

quiet often a lack of challenging teaching materials for gifted students, while students with special needs received disproportionately more attention than gifted ones (Greet, Minnaert, & Kamphof, 2013, p. 138).

As the additional wind at one's back, the Government of the Netherlands, together with numerous scientific institutions, carried out series of projects from 2000 to 2010 in order to clearly define talents of gifted students – it is a gift, a natural ability that needs to be developed, directly depending on an exceptionally stimulating environment (Greet, Minnaert, & Kamphof, 2013, p. 139). In 2009, after the internal economic crisis and the progress of countries on other continents, the Netherlands become aware of its vulnerability and encouraged the development of gifted and talented students. The guidelines for Primary and Secondary education, including the “Leonardo” (school-within-a-school) model, so-called ‘Technasiums’ (pre-university education focusing on science), bilingual education, and “younger faculties” (a partnership between universities and several secondary schools) have resulted in as much as 60% of schools choosing the separate approach.

As it can be expected, another Western European country which for many years nurtured an opinion that children with special needs deserved attention is Germany. Gifted children were considered as capable of handling the learning process with an ease and not in a need of additional support (Fischer, & Muller, 2014). Nevertheless, comparing to the situation in our country, a remarkable improvement is clearly visible in the Federal Republic of Germany. Surprisingly, pioneers in the new wave are organizations and institutions outside the school system, such as parents' associations and foundations, which is completely opposite to tendencies in another Western European country - the Netherlands, where the focus is on the school system as the bearer of change. There are visible differences in the gifted education approach in Germany, where two models stand out - the “accelerated learning”, which requires a high ability of quick data processing, while the “enrichment” (the extensive learning) requires a high ability of huge amount of data processing.

Namely, as already mentioned, the pioneers of gifted inclusion in Germany were associations and foundations. Some of the most important associations are: Bildung & Begabung, parents' associations as primary observers of gifted children such as Deutsche Gesellschaft für das hochbegabte Kind (German Association for Gifted Children), Hochbegabtenförderung e.V (Society for Gifted Education), and “Mind - Mensa in Deutschland e.V” (Mensa in Germany). Some of the most famous foundations in Germany are the Karg-Stiftung für Hochbegabtenförderung - Karg (Foundation for Gifted Education) and the Stifterverband für die Deutsche Wissenschaft (Association of Foundations for Science in Germany). Also, there is the German Government Foundation (Deutschlandstipendium), as well as the Foundations of the Catholic (Cusanuswerk) and the Protestant Church (Evangelisches Studienwerk Villigst). One of the most important foundations is the ‘Deutsches Schülerstipendium’ (German Student Scholarship), which supports highly capable students from poor families. All of this gives us a conceptual model that could be adopted in our country, beyond the framework of measures and action plans of the Govern-

ment of the Republic of Serbia. We proudly emphasize that there is an association in our country which encourages the development of the gifted - the National Talent Center, therefore we do not fall far behind the Western European model.

Moreover, in 2012, the Grand National Assembly of Turkey (TGNA) formed a working group focused to improve the status of gifted children, while keeping in mind that these children represent the largest source of country's immaterial wealth. Consequently, they are the basis of future development and will shape the future of the state, if they receive adequate and timely support during their education.

To continue, as far back as in 1962 in Austria, it was explicitly mentioned that the gifted should be provided with the adequate protection. In 1970, the practice that students who exhibited talent had the possibility to skip a grade was introduced. In 1990, the gifted were recognized as the special category, with all rights which belonged to children with learning difficulties or disabilities. In 1999, a special Austrian Center for Research and Support for the Gifted and Talented was established in order to support both gifted children and their parents and teachers (Reid, & Boettger, 2015).

If we take a look at the Hungarian educational system, we will see that gifted students receive excellent treatment and quite good starting point to develop their talents even further. This system recognizes gifted students as those who require special treatment (Reid, & Boettger, 2015, p.164). What particularly stands out in the Hungarian Education Law (2011) is the application of "enriched" teaching, which comprises additional classes, custom assignments, and various external competitions, while skipping classes or sharing classes with older students is a rarity. More and more teachers take part in trainings in gifted education on a daily basis, with the ultimate goal to train one teacher who specializes in gifted students per school to coordinate the work and progress of these students (Monks, & Pfluger, 2015).

In the United States, we find the extraordinary situation where gifted students, as well as their education, have been nurtured since the 1920s and 1930s. The pioneers in this field, including Terman and Hollingworth, expanded this movement and conducted the first research on gifted children which was widely publicized. According to National Association for Gifted Children during the 1970s the movement received support in the form of statutory regulations when the federal government dealt with gifted issues specifically and introduces the National Standards in Gifted and Talented Education (2013). An extremely important legal act in this field is the so-called Javits' law (1994), named after Senator Jacob Javits for his role in promoting gifted education. The original 1988 law was revised in 1994 to create the opportunity for primary and secondary schools to meet the needs for educating gifted and talented students. Due to its importance, this law has been accompanied by numerous congressional activities, among which is the financing of the Javits program for gifted students. Although, in 2003 and 2006 an impressive \$11.2 million and \$9.6 million were allocated, scientific circles in the United States consider these figures as insufficient to educate and stimulate the gifted. Another very important legal act is the No Child Left Behind Act (2002) which requires

state schools financed from the federal budget to implement yearly standardized knowledge and skills tests among all students. This equalizes initial possibilities of gifted students, from middle and upper-class families with students from lower income families.

Moreover, the Department for Children, Schools and Families in the UK (2008, p.6) has implemented series of actions and measures aimed to support gifted education, including the National Programme for Gifted and Talented Education, clearly defining that the program encompasses children and young people with one or more abilities developed far beyond their age group. The United Kingdom went above and beyond when the Government established a national strategy and national standards in order to improve the education of gifted and talented children in schools. The Institution Quality Standard (IQS) is set up to make it easier for schools to plan gifted education, while the Classroom Quality Standard (CQS) is designed to help educators teach gifted students (Pfeifer, 2002).

When it comes to the rights of the gifted, it is necessary to address the very current topic of inclusive education, which not only refers to education of children with disabilities as the inclusion into the regular educational system, but also to quality education for all children. Every democratic society firstly needs to emphasize tolerance as a basic prerequisite to respecting diversity, in order to be able to implement and accept inclusive practice (Velisek, 2013).

According to research the authors made on this topic, inclusion is best defined as an inclusion process. Regardless the diversity, inclusion of every child into the educational system should be developed in parallel with social inclusion. It is necessary to observe the concept of inclusive education from linguistic and logical interpretation, as a wide spectrum concept without any obstacles gifted students may encounter. If inclusive classrooms are planned for all students, this kind of education has to be applied analogously to the most extreme examples of gifted students, as well as to those with the most severe shortcomings and difficulties (Kearney, 1996). The very concept of inclusive education implies an education system tailored to a child in accordance with its needs. More importantly, inclusive education is most frequently associated with students with developmental disabilities, and the adaption of educational programs to this student category. Some authors, as Gordon and other opponents to "full-inclusion", argue that not all children with developmental disabilities can be part of an inclusive education system. He points out that it is completely unreasonable to expect, for example, deaf students to participate in classes and share classrooms with pupils who do not have this disability. Also, it is unrealistic for inclusive education to be compulsory if parents estimate that a special mode of education will be of the greater benefit to this vulnerable group of children (Gordon, 2013, p.755). In accordance with the abovementioned, it is important to invoke the Law on the Prohibition of Discrimination (2009) which implies direct and indirect discrimination. According to Article 6 of the aforementioned law, direct discrimination exists if a person, or a group of persons are due to his/her or their personal characteristics, in the same or similar situation, placed in a more unfavorable position, or could be placed in a more unfavorable po-

sition. Article 7 states that indirect discrimination exists when a person, or a group of persons, is placed in an unfavorable position by an act, action or omission that is apparently based on the principle of equality and non-discrimination, unless justified by a legitimate goal, while the means to achieve that goal are appropriate and necessary. Invoking the provisions of the aforementioned law, it can be concluded that gifted students do not appear to be placed in an unequal position compared to other students. Opening the door to inclusive education implies that regular education should be available to children, while the teaching staff has to adapt their mode of teaching to the individual needs of children according to the Ombudsman (2017). Inclusion means providing support to both employees and students, while the product of all of that is a community that encourages and respects their achievements (Booth, & Ainscoll, 2002).

On the other hand, the definitions of the concept of inclusion and inclusive education in a number of different countries present an interesting comparison.

To begin, in the United States, inclusion is defined as providing services to students with disabilities, including those with severe disabilities, to ensure child's social adaptation (Frederickson, & Cline, 2002, p. 66).

Moreover, in the UK, we find several definitions and grounds created by different organizations and institutions. To illustrate, the Ministry of Education states in its official document "Inclusive education" that schools which are supported by a local education authority should actively seek to remove barriers to learning and participation that can hinder or exclude learners with special needs (DfES, 2001, par. 7). The Center for Studies on Inclusive Education (CSIE), an organization promoting the growth of inclusive schools in the UK, sees that inclusion enables all students to fully participate in life and work, regardless of their needs; it is also a permanent process for removing the barrier to learning and participation for all children and young people. The Equity Group Association from Scotland believes that inclusive education recognizes that children have equal rights and equal value. This should be a fundamental starting point for education and social policy in modern society. Interestingly, the concept of inclusive education in Turkey, as established by the Rulebook on Special Education of the Ministry of Education, implies that inclusive education is a special educational practice based on the principle that the education of individuals with special needs continues with peers without disabilities in state and private schools, pre-school, elementary school, adult education, providing them with educational support services (Melekoglu, Cakiroglu, & Malmgren, 2009, p.1). Finally, in the Netherlands, inclusive education is called "the appropriate education" (Thijs, van Leeuwen, & Zandbergen, 2016, p.1).

Conclusion

Based on extensive research and all aforementioned in this paper, the authors conclude that inclusive education implies students with special needs, as it is interpreted by countries such as Turkey, Great Britain, and the United States. The authors believe that it is necessary to state

explicitly in the legal acts of all countries that the concept of inclusive education applies to the gifted as well. This is crucial in order to ensure further legal acts to regulate the position and further treatment of gifted students. It is important to point out those legal acts of Croatia, Netherlands, Germany, Turkey, Austria, Hungary, United States, Great Britain, and Republic of Serbia regulate the rights of the gifted.

Since the educational system in the Republic of Germany has been thoroughly examined and presented in this paper, it can be concluded that this system is the most developed in the area of education of gifted. We believe inclusive education in the Republic of Serbia can also be extended to the category of the gifted. The numerous measures and action plans from a number of countries can also serve as a model for the Serbian Government. For this premise to be accepted, both on the theoretical and practical level and without any exception, it is necessary to understand that the essence is not only to agree on differences, but to stimulate the individuality and diversity of the gifted at all levels, because the greatest gem of each country is, truly, its educated children.

References

- A brief history of gifted and talented education, *National Association for Gifted Children (NAGC)*, Washington. Retrieved from <http://www.nagc.org/resources-publications/resources/gifted-education-us/brief-history-gifted-and-talented-education>
- Blaquer, J. (2011, 10) Activites sportives et educatives, *Bulletin officielle* 38. Retrieved from http://www.education.gouv.fr/pid25535/bulletin_officiel.html?cid_bo=57926
- Boer, G., Minnaert, A. E., & Kamphof, G. (2013, 01) Gifted education in the Netherlands, *Journal for the Education of the Gifted* 36(1), 133 -150. doi:10.1177/0162353212471622
- Booth, T., Ainscow, M. (2002, 9). Indeks za inkluziju, *Centar za izučavanje inkluzivnog obrazovanja*, CSIE. Retrieved from www.eenet.org.uk/resources/docs/INDEX%20SERBIAN.pdf
- Civic Impulse. (2018). H.R. 543 — 100th Congress: Jacob K. Javits Gifted and Talented Children and Youth Education Act of 1987. Retrieved from <https://www.govtrack.us/congress/bills/100/hr543>
- Effective provision for gifted and talented children in primary education (2008,5)*, Published by the Department for Children, Schools and Families, UK, 1-40, ISBN 978-1-84775-2
- Fischer, C., & Müller, K. (2014). Gifted education and talent support in Germany, *CEPS Journal* 3(4), 31-54.
- Frederickson, N., Cline, T. (2002). *Special educational needs, inclusion*. Open University Press, Buckingham.
- Gordon, J. (2013, 12). Is inclusive education a human right? *The Journal of Law, Medicine & Ethics*, 41(4), 754-767. doi:10.1111/jlme.12087
- Hodges, J., Tay, J., Maeda, Y., & Gentry M. (2018, 01). A meta-analysis of gifted and talented identification practices. *Gifted Child Quarterly*, 62(2), 147-174.
- Inclusive Schooling: Children with Special Educational Needs (2001, 11)*. Department for Education and Skills (DFES/0774/2001). 1-64 ISBN 1 84185 629 0, London.
- Kearney, K. (1996). Highly gifted children in full inclusion classrooms. *Highly Gifted Children*, 12 (4), 1-11 retrieved from <https://files.eric.ed.gov/fulltext/ED425575.pdf>
- Kelemen, G. (2012, 11). Identification of highly gifted children. *Exedra* 6, 43-55.
- Marland, S.P. (1972). *Education of the Gifted and Talented*. Report to the Congress by the U. S. Commissioner of Education, Washington, DC: U.S. Government Printing Office
- Melekoglu, M., Cakiroglu, O. & Malmgren, K., (2009, 5). Special education in Turkey. *International Journal of Inclusive Education*. 13(3), 287-298. doi: 10.1080/13603110701747769
- Monks, F.J., Pflugger, R. (2005,12). *Gifted Education in 21 European Countries: Inventory and Perspective*. Radboud University Nijmegen, Netherlands

- Omeroglu, E., Sarikaya, R., Daglioglu, H. E., Kilic Cakmak, E., Karatas, S., Arici Bulut, S., & Basit, O. (2017). The terms used in gifted and talented education in Turkey, relevant legal framework and educational practices. *International Journal of Early Childhood Special Education*, 1-30. doi:10.20489/intjecse.329697
- Ozcan, D., & Gunduz, N. (2016). Gifted education policies in different countries. *PONTE International Scientific Researches Journal*, 72(6). doi:10.21506/j.ponte.2016.6.15
- Pfeiffer, S. (2002,1). Identifying gifted and talented students: Recurring issues and promising solutions. *Journal of Applied School Psychology* 1(1), UK, 31-50 doi: 10.1300/J008v19n01_03
- Reid, E., & Boettger, H. (2015). Gifted education in various countries of Europe, *Slavonic Pedagogical Studies Journal* 4(2),158-171. doi: 10.18355/pg.2015.4.2.158-171
- Silverman, L. (2013). Why does Denmark need gifted education? *Gifted Children's Symposium 2013*. Soro, Denmark, 20 April 2013, 1-9
- The Danish Education System, published by The Ministry of Higher Education and Science, 15 September 2016, 1-24 ISBN 87-92962-60-2
- Thijs,A., van Leeuwen, B., & Zandbergen, M.(2016). *Inclusive Education in the Netherlands*. SLO, Enschede, AN 2.4624.165 Retrieved from <http://www.goprince.eu/wp-content/uploads/2016/11/INCLUSIVE-EDUCATION-IN-THE-NETHERLANDS.pdf>
- Velišek, B. (2013). Konstruktivistički prikaz inkluzije, polazišta kvalitetnog obrazovanja, *Krugovi detinjstva* (1), 17-25
- Woods, J.(2016). *State and Federal Policy: Gifted and talented youth*. Retrieved on november 2016, from <https://www.ecs.org/wp-content/uploads/State-and-Federal-Policy-for-Gifted-and-Talented-Youth.pdf>

Legal Acts

2011. Evi CXC. Torveny a nemzeti koznevelesrol, *Wolters Kluwer*, 30 june 2018, Retrieved from <https://net.jogtar.hu/jogszabaly?docid=A1100190.TV>
- Framework Law on Primary and Secondary Education in Bosnia and Herzegovina, *PSBiH* No. 59/03, 30 June, 2003
- Law on Education in Elementary and Secondary School in Croatia, *Consolidated Text on Law* NN 87/08, 86/09, 92/10, 105/10, 90/11, 5/12, 16/12, 86/12, 126/12, 94/13, 152/14, 07/17, 26 January, 2017
- Law on the Foundations of the Education and Upbringing System, *Official Gazette of the Republic of Serbia*, No. 88/2017
- Pokrajinski zaštitnik građana Ombudsman. (2017) *Podrška učenicima sa izuzetnim sposobnostima u osnovnim i srednjim školama u AP Vojvodini*, 1-53, decembar 2017, Retrieved from www.ombudsmanapv.org/riv/attachments/article/1974/DAROVITI-ucenici-istra-zivanje-2017.pdf
- UN General Assembly, *Universal Declaration of Human Rights*, 10 December 1948
- UN Educational, Scientific and Cultural Organization (UNESCO), *Convention Against Discrimination in Education*, 14 December 1960, UN General Assembly, *Convention on the Rights of the Child*, 20 November 1989, United Nations, Treaty Series
- No Child Left Behind Act of 2001, P.L. 107-110, 20 U.S.C. § 6319 (2002).
- Zakon o zabrani diskriminacije, Službeni glasnik Republike Srbije, br. 22/2009 retrieved from https://www.paragraf.rs/propisi_download/zakon_o_zabrani_diskriminacije.pdf

ANALIZA KONCEPTA PRAVA DAROVITIH NA INKLUZIVNO OBRAZOVANJE

Ivona Ninkov, Jovana Vajdić i Kosa Protić
Udruženje "Rights4All", Balzakova 17, Novi Sad, Srbija

Apstrakt

U radu je dat uporedni prikaz pravnih akata različitih pravnih sistema, kontinentalnog i anglosaksonskog prava, koji se odnose na prava darovitih. Prikazano je na koji način su regulisana prava darovitih u Bosni i Hercegovini, Hrvatskoj, Srbiji, Holandiji, Nemačkoj, Turskoj, Austriji, Danskoj, Mađarskoj, SAD i Velikoj Britaniji. Dotakli smo se koncepta prava darovitih na inkluzivno obrazovanje u pravnim aktima Republike Srbije, a uz to smo naveli i terminološka razjašnjenja pojma inkluzivnog obrazovanja u različitim zemljama, poput SAD, Velike Britanije, Turske, Holandije. U toku izučavanja navedene tematike, korišćen je komparativni metod pri čemu smo se fokusirali i na kontinentalni i na anglosaksonski pravni sistem. Cilj rada je da prikaže da se inkluzivni pristup obrazovanja može primeniti i na darovite, iako je uvreženo shvatanje da se u većini zemalja pod pojmom inkluzivnog obrazovanja prvenstveno misli na decu sa smetnjama u razvoju i invaliditetom. Pri izradi rada došli smo do zaključka da je moguće primeniti inkluzivni pristup obrazovanja, kao savremenog društvenog fenomena, na darovite.

Ključne reči: prava darovitih, inkluzija, pravni sistemi, obrazovanje.

UDC 376.1-056.26/.36:340.134(497.11)
Original scientific paper

LEGISLATIVE CONDITIONS AND TEACHERS' COMPETENCIES FOR WORK WITH GIFTED STUDENTS IN SERBIA

Marinela Šćepanović¹ & Tanja Kalinić²

¹*Society of Vojvodina's special educators and rehabilitators, Novi Sad, Serbia*

²*Secondary technical school, Sombor, Serbia*

Abstract

The aim of this paper is to point out the importance of continuous professional development as a reinforcement of teachers for work with gifted students due they do not feel competent enough for that kind of engagement. In addition, we wanted to point out the main conditions for that kind of educational work which is given by laws in our milieu. For the purpose of this paper we analyzed available results of studies, concerning the development of teachers' competencies for work with gifted students, and also the current legislative conditions and other capacities in Serbia needed for this specific kind of educational work. We reviewed studies which were dealing with the development of teachers' competencies for work with gifted students. Most of the researchers find out and conclude teachers need additional professional development opportunities in teaching skills and behaving, in standard students and parents, and in assessing student's abilities, in order to understand the development of gifted pupils, advance own pedagogical knowledge and attitudes toward gifted and talented students. Teachers of the gifted must be open-minded, flexible, knowledgeable in varied disciplines, have to use effective classroom management techniques, but also to be highly intelligent. A professional standard system of work with gifted students and gifted education standards must be created. In the process of analyzing the legislation on the education of gifted students, we have considered the set of five new educational laws and their content related to gifted students. Analyze showed that regulations are positive but not concrete enough, teachers have not enough knowledge, experiences and professional training and programs in this field, they are not motivated to engage themselves, and there are no created professional standards and gifted education standards on the national level. All participants in school life will gain benefits by changing in this field in the close future, but others will, also.

Keywords: gifted student, teacher, competences, legislation, standards.

Introduction

The aim of this paper is to point out the importance of continuous professional development as a reinforcement of teachers for work with gifted students due they do not feel competent enough for that kind of engagement. In addition, we wanted to point out the main conditions for that kind of educational work which is given by laws in our milieu.

In Serbia inclusive education started in 2009 when new Law of Educational System (The Law on Foundations of Educational System, 2009) claimed every child can attend nearest or school chosen by parents and school has to make adaptations of program for all exceptional pupils, even to create individual educational plans in order to satisfy children's special educational needs (this refers to pupils with disabilities and also to gifted ones).

After nine years of formal implementation of inclusive education, we wanted to see how it relates to gifted children and students in schools and kindergartens and whether there has been a positive change during this period. Therefore, we conducted a review of the literature and analysis of the applicable legislation regarding the competencies of teachers and the conditions for the implementation of inclusion in Serbia.

Method

Firstly, for the purpose of this paper we analyzed available results of studies conducted in our country and wider, concerning the development of teachers' competencies for work with gifted students, and also the current legislative conditions and other capacities in Serbia needed for this specific kind of educational work. We reviewed professional and scientific studies which were dealing with the development of teachers' competencies for work with gifted students. Studies were selected across the known searching services and on-line scientific bases. Most studies were selected using search words: teachers, competences, professional development, and gifted students. Terms of the search were: limitations to full text and peer-reviewed works published in academic journals in the last ten years. In the process of analyzing the legislation on the education of gifted students, we have considered the set of five new educational laws and their content related to gifted students.

On the other hand, an analysis of the current legislation was made, especially of five new education laws that were passed in 2017 and came into force immediately. The research task was to find out whether the new laws improved the conditions for inclusive education, and in particular whether conditions for working with gifted students were improved. In addition, the analysis also took into other resources that can be of use to children and students in Serbia, such as special centers.

Results and Discussion

Intellectual capital is important for any country; nurtured, it will benefit both the individual and the whole population (Koshy, & Pinheiro-Torres, 2013). According to Passow (2003), some nations consider the

education of gifted students as a basic need of the state, whereas others have an intention to provide for the development of each individual's self-fulfillment through equal educational opportunity.

Our laws, as the main policy documents, emphasize inclusive education for all students with special educational needs, including gifted and talented. Šćepanović (2018 a) on the education of not-the-same students emphasizes the importance of the moral aspect of accepting not-the-same ones in their own environment, and the fact that such children were found, under the cover of inclusive education, in one common educational system 'which one was not morally mature, and also not ready for them'.

The Law on the Foundations of the Education System (2009) introduced inclusive education without mentioning of it directly but stipulating that every child can be enrolled in the nearest or selected school and that for children with disabilities and children with exceptional abilities individual educational plans could be created. Schools, kindergartens, educators, teachers and professional associates have been trained in short seminars for working with children with developmental disabilities and that was how inclusion began. Employees in the education system were practically inadequately prepared to work with children of atypical development due they had not enough basic knowledge about these groups of children and their educational needs. At the beginning of the application of inclusive education, full attention was paid to working with children with disabilities. Gifted children and students did not have almost any additional support in education, which was required by their specific needs. The exceptions are students gifted for music and ballet, who could have been educated in separate conditions, in special music and ballet schools.

In autumn 2017, a set of five new laws regulating the work of the educational system in Serbia was adopted. These are the Law on Preschool Education and Upbringing, the Law on the Foundations of the Education System, the Law on Primary Education and Upbringing, the Law on Secondary Education and Upbringing, the Law on Dual Education and the Law on Higher Education. A completely new one is the Law on Dual Education, while the other four existed formerly under the same names and now they appear to have significantly changed.

The Law on the Foundations of the Education System in part General principles of education, say that the system must provide for all children ten principles; in implementing the principles, special attention is paid to several things, and among them on „ ... 5) reducing the rate of abandonment of the education system, especially persons from socially vulnerable categories of population and underdeveloped areas, persons with disabilities and disabilities and other persons with specific learning disabilities and supporting their reintegration into the system, in accordance with the principles of inclusive and intercultural education and upbringing;“. The same law mention, as previous, obligation of forming Inclusive Education Team tandard needed and new task for professional associates: „... working on the development of the inclusiveness of the institution“ (Šćepanović, 2018 b).

Laws regulating the work of the education system in Serbia do not tandar provide for the possibility of forming special classes for students

with exceptional abilities, but a specialized school can be established and schools can work with a sample curriculum, while students with disabilities can be recommended to attend a specialized school for the education of such pupils in separate conditions. The special Commission makes recommendations for health, social and educational support measures, which include directing students to specialized departments and schools. This commission exists in every municipality and it employs a tandardrsn, a psychologist, a social worker and a special educator, and other people and experts may be involved in the work if they are proposed by the parent or guardian of the student.

The Commission's opinion describes what kind of support is necessary and needed to be provided to a student for his optimal and successful education. The opinion of this commission is only applicable when it is confirmed and accepted by the parent or guardian of the student. In any case, the law stipulates that an individual education plan may be created for students only if it is one of the proposed measures provided by the aforementioned Commission. Before drafting such a plan, teachers should apply individualization measures in their work, such as different differentiated approaches and methods, but can not change the content and expected outcomes of the curriculum.

Serbia does not have a strategy for work with gifted students, nor any similar document as an action plan or agenda for the development of education of gifted or similar activities. Stamenic (2018) also finds that in Serbia, there is no adequate strategy for the education of gifted students.

The results of the research by the Provincial Protector of Citizens – Ombudsman (2017) on support to students with exceptional abilities have shown that certain forms of support are applied in working with students with exceptional abilities, but that the implemented measures and activities are often insufficient. The results of the research also show that there are difficulties to identify students with exceptional abilities and that teachers and professional workers in schools need additional education in terms of knowing the phenomenon of giftedness, the needs of gifted students and working with them.

It is necessary to note that, in accordance with the new Law on the Foundations of the Education System, which entered into force in 2017, IOP3 [Individual Education Plan 3 – for students with exceptional abilities] refers only to pupils with exceptional abilities, but does not refer to pre-school children with such abilities. Namely, by the Law on the Foundations of the Education System (2009) that was put out of service, IOP3 was defined as enriching and expanding the contents of educational work for children and students with exceptional abilities. Based on the above, it is concluded that for the new legal solution children of pre-school age with exceptional abilities are “invisible”. Analyzing the Law on Preschool Education and Upbringing (2017), it was concluded that it does not recognize gifted children as children who need special educational support and an individualized approach in achieving educational work (Provincial Ombudsman, 2017).

The Rulebook on Detailed Instructions for Determining the Right to an Individual Education Plan, its Application and Evaluation (2010) details

the users of this right, the content of the IOP and the procedure for exercising the right to the IEP, the manner of issuing, evaluating and amending the document, and the like.

Although the law of 2009 foresees the introduction of a customized and individualized way of working with students of exceptional abilities, this measure has been used only sporadically and with a certain reserve over the past years. According to the Ministry of Education, according to the enriched and expanded program that applies to students with special abilities (IOP 3), there are 513 pupils in elementary and 207 in secondary schools, but there are no precise data from which subjects and areas are most developed IEPs 3 In the report on the realization of the final exam, we found that 89 students were educated in the last year's generation of 8th grade students according to IEP3, and most of them were in the North Banat District (33) and the West Bačka District (20) (Stamenic, 2018).

The Institute for the Advancement of Education and Education (founded by the Government) in 2016 published the monograph 'Education of students of exceptional abilities: the scientific basis and guidelines for school practice' (Altaras & Tatić Janevski, 2016). The monograph can also serve teachers and schools as a manual for individualizing work with gifted and talented students, as it also contains examples for the preparation of an individual education plan for students with exceptional abilities (IEP3). Judging by the news about the activities of the Institute, it seems that Institute is trying to closely connect schools with ten active regional talent centers in Serbia in order to contribute to the improvement of the education of the gifted. There are thirteen regional centers for talents in Serbia (but ten of these are active), one National Center and the Network of Regional Talent Centers. These centers are supported in their work by the republic and local governments and the focus of their work is the preparation of pupils for competitions in the country and abroad. Centers were established long before the introduction of inclusive education, which did not bring about changes in their work.

The need to improve or modify the work of the present talent centers needs to be analyzed when drafting a strategic act that will deal with the education of gifted. In the study dealing by historic strategic document for education of gifted in USA, the Javits Act, Renzulli, Callahan, and Gubbins (2014) got Rankings of Categories of Items on National Needs Assessment Survey about The National Research Center on the Gifted and Talented. Ranking list has twenty-one item, but in the third place, it is the item: Teacher training/staff development necessary for curriculum modification or development. More important were only Impact of gifted programs on student outcomes (longitudinal), and Regular curriculum modification. This example also points to the necessity of analyzing the needs of gifted which should be evidence-based, and before making strategic decisions and documents.

Analyze of the current legislative conditions and other capacities in Serbia showed that regulations are positive but not concrete enough, and above all, that existing positive provisions and legal possibilities, unfortunately, are not sufficiently used in practice.

Through analyzing the selected studies, we found many similar opinions and conclusions about teacher's competences. According to Stamenic (2018) the serious problem is the lack of knowledge and skills of experts who need to deal with gifted students in Serbia.

Based on the results of the research about the inclusive education, Šćepanović (2018 b) points out the respondents' proposals regarding concrete measures, and in particular the introduction of more expert for work with children and pupils of atypical development in schools and kindergartens (45.7%), as well as providing more professional development and training for teachers and other employees (21.3%).

Šćepanović and Kalinić (2018 b) carried out the above-mentioned research activities questioning employees in the educational system – teachers, special teachers, professional associates and other educators working with children of atypical development – about inclusive education. Most respondents (51.6%) believe that inclusive education in Serbia is not successful. In the opinion of 63.2% of the respondents, teachers are not prepared to work with children of different abilities. Only 16.9% of the respondents rated the work with children with exceptional abilities as very good and excellent, and 33.7% of the respondents rated this work with the lowest marks. While 75.8% of respondents participated in the development of individual education plans for students with disabilities, only 4.3% of them participated in the development of individual educational plans for students with exceptional abilities, and more teachers (5.5%) were not even aware that there is such a thing at all.

In terms of teachers who are not familiar with or not trained to recognize giftedness, it is an illustrative example of a research finding carried out by Mhlolo (2017), who found that in 63% of the micro-moments students' creative ideas were considered disruptive and were therefore not recognized.

For advisory work with gifted pupils are prepared professional associates something better than teachers in schools and kindergartens, but they also lack continuous professional training in this field. According to Olszewski-Kubilius, Subotnik, and Worrell (2015), apart from advisory work, expert associates should also work on developing special programs that would be useful and adapted to gifted students.

Two of the major concerns in the use of teacher rating scales appear to be related to the general lack of training of teachers to allow for the appropriate identification of the different manifestations of giftedness, and a common reliance by teachers on personal conceptualizations of giftedness which may not reflect the adopted definitions of giftedness (Cao, Jung & Lee, 2017).

The suggestions and proposals of the respondents obtained in the study of attitudes towards inclusive education conducted by Šćepanović and Kalinić (2018 b) related to the inclusive education and upbringing show that 45.7% of the respondents think that more professionals for work with children of atypical development need to be introduced in the institutions. The next 21.3% of the respondents consider that the employees in the educational system need more professional training, and some consider that it is necessary for children of atypical development to be directed to specialized departments and schools.

The findings of the research conducted by Bruria, Hagar, Bertha, and Eun-Sung (2015) demonstrate that many teachers oppose the separation of mathematically talented students into special classes believing that the nurturing of these gifted students can be applied within a mixed-ability class. That results also may point to that teacher belief may inhibit his/her development as he/she may believe to already possess skills for use of more effective tools, teaching skills, and knowledge needed for effective educational work with gifted students. On the other side, same authors concluded that teachers with any mathematical background and who teach smaller classes displayed higher self-competence in nurturing mathematically talented students, which is equivalent to the previous assertion.

Studies conducted in both Australia and the United States have found that providing in-service to teachers in topics relating to gifted education can result in significant improvements to teacher attitudes toward gifted and talented students (Geake & Gross, 2008). Likely, Gross (1994, in Geake & Gross, 2008) finds that in the case of teachers who have chosen additional education in the field of work with gifted, there are positive changes in relation to the usefulness of gifted people which teachers can better recognize now. Also, Geake and Gross (2008) found that teachers who had completed a professional development program in gifted education were significantly less wary of their gifted students than teachers who were still at the beginning of such a program.

Regarding the characteristics and necessary competences of successful teachers of gifted children, Miedijensky (2018) finds all the teachers stressed that teachers of the gifted must be open minded, flexible, and knowledgeable in varied disciplines. Also, is noted in the literature that teachers of the gifted must be highly intelligent and exceedingly proficient in their specific field. Such expertise allows teachers to be creative and thus provide suitable learning experiences for their gifted students. Nevertheless, teachers acknowledged that intelligence and expertise in various realms does not, in and of itself, suffice. Teachers of gifted children must be able to draw meaningful connections between diverse fields and give attention to meeting society's needs (Miedijensky, 2018). In other words, to educate gifted students toward their future roles as citizens and potential leaders of their communities, there is a need to develop empathetic attention, the ability to listen, sensitivity, and awareness of others' needs (Croft, 2003; Renzulli, 2002; Van Tassel-Baska and Johnsen, 2007; Whitlock and DuCette, 1989, all in Miedijensky, 2018). Can our teachers achieve this with their current knowledge, readiness, skills and motivation? Some of them can certainly. But most of the others need additional support, help, additional professional training and guidance and tandards to carry out this task.

On the contrary, there are frequent findings of more researchers (Gentry & Fugate, 2012; Ford, 2015; Mansfield, 2016; Wright & Ford, 2017) regarding the discrimination of gifted students derived from racial, cultural, religious, gender and other differences and prejudices, which primarily come from teachers of gifted students and their attitudes.

Some researchers have demonstrated success in developing teachers' abilities to implement specific curriculum (Reis et al., 2005; Van-

Tassel-Baska, Zuo, Avery, & Little, 2002; all in DeVita Rubenstein, 2013) or specific components of gifted pedagogy (e.g., compacting; Reis & Westberg, 1994, in DeVita Rubenstein, 2013). But, McCoach and Siegle (2007), on the contrary, found that training in gifted education had no effect on teachers' attitudes toward the gifted population or gifted education in general. Teachers training for gifted education were considered in many other researches (Brulles, & Winebrenner, 2011; Mammadov, 2015; Edinger, 2017; Berman, Schultz, & Weber, 2012).

When mentioning collaboration with parents at all, Šćepanović and Kalinić (2018a) stress constant need to improve it developing professional capacities of all school staff members and to build up staffs' communicational skills. Important parental involvement can be also increased through adequate education and preparation of the staff (George and Hancock, 1993, in Šćepanović and Kalinić 2018a). As Peterson (2015) noticed, teachers working with parents of gifted students can acknowledge that parenting gifted children and teens is likely quite challenging, and they can help parents to use a developmental framework to make sense of their children's standard, but only if they have needed competencies. In addition, the literature related to social and the emotional development of gifted youth is not well known within and outside of the gifted education field, including in the field of standards.

The results of the research by the Provincial Ombudsman (2017) on support to students with exceptional abilities have shown that teachers and other professionals in schools need additional education in terms of knowing the phenomenon of giftedness, the needs of gifted students and knowing methods of how to work with them. It is necessary to continuously monitor and educate the teaching and professional staff of educational institutions in relation to inclusive education; the results of this research coincide with the findings of previous research and experiences in educational work with gifted students, first of all those who say that there are difficulties in identifying, i.e., recognition of gifted students, especially gifted pupils and children and early and younger pupils, as well as insufficient education and motivation of teaching and professional staff in schools to work with them (Provincial Ombudsman, 2017).

However, some notions and actions must necessarily be distinguished as a priority in relation to others in the education of gifted children and students. It is therefore important to conduct a good analysis of the current situation in this area, to set priorities, goals and tasks, and then to go engage in the business. All those involved in the education system would have important responsibilities and tasks, and we would, in this way, stop all concerned with all aspects of the education of gifted children and students with the insufficient success of doing that. The experiences of others can teach us how to do this without mistakes, as in the following example.

We identified a need for further professional development for teachers and for challenging the policy's over-emphasis on identifying and standard gifted and talented pupils. We posit whether the gifted and talented education policy would have been better introduced and enjoyed greater success by leaving the identification of pupils to one side and by

placing greater emphasis on developing effective learning and teaching strategies instead (Koshy, & Pinheiro-Torres, 2013).

Mammadov (2015) stresses a lack of coherence in definition, identification, and placement concerns, as well as teacher training and personnel preparation in education of gifted in Turkey. The lack of enhanced and implemented education models; limited scientific research; a shortage of experts, teachers, and administrators with expertise relevant to gifted education; and insufficient funding can provide some important elements that underpin the weaknesses of the policies and practices (Mammadov, 2015). We are prepared to recognize most of previous mentioned as a features of our inclusive reality, especially those related to the gifted and talented students.

Ho Seong (2016) deems nation-wide professional standards system is needed to be developed in order to further education of gifted. Research of Johnsen (2012) indicates that standards have a positive effect on professional competence. Trained teachers incorporate more differentiated practices from standards into their classrooms. For example of standards, Mammadov (2015) explains the lack of sufficient teacher preparation and in-service teacher training programs for educating gifted students as a critical problem in Turkey, but says that although some policy documents emphasized the importance of teacher preparation there is no legislation that delineates any requirements for teachers of gifted students. The establishment of standards for professional development is a solid starting place; however, without systematic provision of pre- and in-service support, it is difficult to establish a community of practicing professionals (Coleman, Gallagher, & Job, 2012).

Gifted education standards are a necessity in developing professionally competent educators. Practitioners who have attained the relevant theory and research, an understanding of the developmental levels of gifted and talented students, a foundation in content and pedagogical knowledge, and classroom instructional management techniques ultimately strengthen the quality of services for gifted and talented students. Moreover, standards legitimize the field of gifted education; build consensus; offer guidance for developing programs at the university, state, and local levels; and may be used for evaluation and advocacy (Johnsen, 2012). We believe that this author explained in the best possible way the need for the establishment of uniform gifted educational standards for working with gifted children and students, which would be of great benefit.

We believe that three activities are central to expanding capacity for professionalism within gifted education: establishing long-term commitment and planning (Gallagher, 2006), creating fidelity approaches that honor flexibility of implementation (Coleman & Shah-Coltrane, 2011), and integrating practices within a collaborative framework of support (Kirk, Gallagher, Coleman, & Anastasiow, 2009) (all in Coleman, Gallagher, & Job, 2012). In addition, it is necessary to consider the current approaches to the education of gifted people in the world, and those who come out of the box of expectations, such as one created by Ziegler and Phillipson (2012), based on the actiotope model of giftedness.

Taking into account the experience of other countries and educational systems, but the specifics of our state and our education system, it

is necessary to take the first but decisive steps in introducing a systemic relationship towards the education of gifted children and students in Serbia. One of the first steps should be, in addition to analyzing the situation and needs, defining the standards of education for gifted children and students, and establishing a system of professional standards for working with gifted people. These are the steps that must be taken by the competent institutions of the state, in collaboration with all other stakeholders, which we expect soon.

Conclusion

Analyze of the current legislative conditions and other capacities in Serbia showed that regulations are positive but not concrete enough, and above all, that existing positive provisions and legal possibilities, unfortunately, are not sufficiently used in practice.

Most of the researchers find out and conclude teachers need additional professional development opportunities in teaching skills and behaving, in counselling students and parents, and in assessing student's abilities, in order to understand the development of gifted pupils, advance own pedagogical knowledge and attitudes toward gifted and talented students. Teachers of the gifted must be open-minded, flexible, knowledgeable in varied disciplines, have to use effective classroom management techniques, but also to be highly intelligent. Also, in-services to teachers can be useful to help to change present predominantly low knowledge and understandings functioning of gifted students, and education, abilities, needs, and development of these students. A professional standard system of work with gifted students and gifted education standards must be created because researches indicate their usefulness and positive effects on the professional competencies of teachers-

By noting the crucial role of political, scientific and educational-teaching factors in curriculum design, the curriculum differentiation shows the possibility of further integrating individual and social needs, as well as the possibility of achieving self-actualization that is necessary to the learner in the learning process. Achieving such goals requires the additional education of teachers, both those who work and those who are just preparing for work at school, through special courses for working with gifted students (Djordjevic and Djordjevic, 2016, in Provincial Ombudsman, 2017).

We have tried to make the case for a renewed commitment to professionalism at the individual and institutional levels...Through professionalism we can forge and strengthen linkages with other stakeholders who are committed to excellence in education for all learners (Coleman, Gallagher, & Job, 2012).

We can say that teachers have not enough knowledge, experiences and professional training and programs in the field of gifted education, they are not motivated to engage themselves, and there are no created professional standards and gifted education standards on the national level. All participants in school life will gain benefits by changing in this field in the close future, but others will, also.

Taking into account the experience of other countries and educational systems, but the specifics of our state and our education system, it is necessary to take the first but decisive steps in introducing a systemic relationship towards the education of gifted children and students in Serbia. One of the first steps should be, in addition to analyzing the situation and needs, defining the standards of education for gifted children and students, and establishing a system of professional standards for working with gifted people. These are the steps that must be taken by the competent institutions of the state, in collaboration with all other stakeholders, which we expect soon.

References

- Altaras, A., & Tatić Janevski, S. (2016). *Education of students of exceptional abilities: the scientific basis and guidelines for school practice*. Retrieved from: <http://zuov.gov.rs/wp-content/uploads/2017/12/Obrazovanje-darovitih-03.pdf>
- Berman, K. M., Schultz, R. A., & Weber, C. L. (2012). A lack of awareness and emphasis in preservice teacher training: Preconceived beliefs about the gifted and talented. *Gifted Child Today*, 35(1), 18. Doi:10.1177/1076217511428307
- Brulles, D., & Winebrenner, S. (2011). The schoolwide cluster grouping model: Restructuring gifted education services for the 21st century. *Gifted Child Today*, 34(4), 35. Doi:10.1177/1076217511415381
- Bruria, S., Hagar, G., Bertha, T., & Eun-Sung, K. (2014). Teaching mathematically talented students: a cross-cultural study about their teachers' views. *Educational Studies In Mathematics*, (3), 409.
- Cao, T.H., Jung, J.Y., & Lee, J. (2017). Assessment in gifted education: A review for the literature from 2005 to 2016. *Journal of Advanced Academics*, 28 (3), 163-203. Doi:10.1177/1932202X17714572
- Coleman, M. R., Gallagher, J. J., & Job, J. (2012). Developing and sustaining professionalism within gifted education. *Gifted Child Today*, 35(1), 27. Doi:10.1177/1076217511427511
- DeVia Rubenstein, L. (2013). Transformational leadership using TED talks. *Gifted Child Today*, 36 (2), 125-132. Doi: 10.1177/1076217512474981
- Edinger, M. J. (2017). Online teacher professional development for gifted education: Examining the impact of a new pedagogical model. *Gifted Child Quarterly*, 61(4), 300. Doi:10.1177/0016986217722616
- Ford, D. Y. (2015). Multicultural issues. *Gifted Child Today*, 38(3), 187. Doi:10.1177/1076217515583745
- Geake, J. G., & Gross, M. M. (2008). Teachers' negative affect toward academically gifted students: an evolutionary psychological study. *Gifted Child Quarterly*, 52(3), 217-231.
- Gentry, M., & Fugate, C. M. (2012). Gifted native American students: Underperforming, under-identified, and overlooked. *Psychology In The Schools*, 49(7), 631-646. Doi:10.1002/pits.21624
- Ho Seong, C. (2016). Critical reflection on teacher training programs in Korean gifted and talented education. *Turkish Journal Of Giftedness & Education*, 6(1), 35.
- Johnsen, S. K. (2012). Standards in gifted education and their effects on professional competence. *Gifted Child Today*, 35(1), 49-57.
- Koshy, V., & Pinheiro-Torres, C. (2013). 'Are we being de-gifted, Miss? Primary school gifted and talented co-ordinators' responses to the Gifted and Talented Education Policy in England. *British Educational Research Journal*, 39(6), 953-978. Doi:10.1002/berj.3021
- Mammadov, S. (2015). Current policies and policy efforts for the education of gifted children in Turkey. *Roeper Review*, 37(3), 139. Doi:10.1080/02783193.2015.1047548
- Mansfield, K. C. (2016). The color of giftedness: a policy genealogy implicating educators past, present, and future. *Educational Studies*, 52(4), 289-312. Doi:10.1080/00131946.2016.1190364

- McCoach, D. B., & Siegle, D. (2007). What predicts teacher's attitudes towards the gifted? *Gifted Child Quarterly*, 51, 246-253.
- Mhlolo, M. (2017). Regular classroom teachers' recognition and support of the creative potential of mildly gifted mathematics learners. *Zdm*, 49(1), 81. Doi:10.1007/s11858-016-0824-6
- Miedijensky, S. (2018). Learning environment for the gifted – What do outstanding teachers of the gifted think? *Gifted Education International* 1-23, 2018. <https://doi.org/10.1177/0261429417754204>
- Olszewski-Kubilius, P., Subotnik, R. F., & Worrell, F. C. (2015). Conceptualizations of Giftedness and the Development of Talent: Implications for Counselors. *Journal Of Counseling & Development*, 93(2), 143-152. Doi:10.1002/j.1556-6676.2015.00190.x
- Passow, A. H. (2003). International perspectives on gifted education. In N. Colangelo & G. A. Davis (Eds.), *Handbook of gifted education* (pp. 528–535). Boston, MA: Allyn & Bacon.
- Peterson, J. S. (2015). School tandardrs and gifted kids: respecting both cognitive and affective. *Journal Of Counseling & Development*, 93(2), 153-162. Doi:10.1002/j.1556-6676.2015.00191.x
- Provincial Protector of Citizens – Ombudsman. (2017). *Support to pupils with exceptional abilities in elementary and secondary schools in AP Vojvodina – Report by the Provincial Ombudsman*. Retrieved from: <http://www.ombudsmanapv.org/riv/attachments/article/1974/Daroviti-ucenici-istrazivanje-2017.pdf>
- Renzulli, J. S., Callahan, C. M., & Gubbins, E. J. (2014). Laying the base for the future: One cornerstone of the Javits Act. *Journal Of Advanced Academics*, 25(4), 338-348. Doi:10.1177/1932202X14542686
- Stamenić, V. (2018, 15th of May). Who deals with gifted students in Serbia? *School portal*. Retrieved from: <https://www.skolskiportal.rs/clanci/1328-ko-se-bavi-darovitim-dacima-u-srbiji>
- Šćepanović, M. (2018 a). Moral education for all. In M. Šćepanović (Ed.), *Education of children and students in inclusive conditions – international thematic collection of papers* (pp. 219 – 229). Novi Sad: Society of Vojvodina's special educators.
- Šćepanović, M. (2018 b). Views of practitioners on inclusive education and upbringing. Opening lecture on the XII international scientific and professional conference 'Education of children with disabilities', Kikinda, 25th and 26th of May 2018. Novi Sad: Society of Vojvodina's special educators.
- Šćepanović, M. & Kalinić, T. (2018a). The importance of parents involvement in inclusive Individual educational plan (IEP) creation. In Nikolić M. and Vantić-Tanjić M. (Ed.), *Thematic collection of papers "Improving the quality of life of children and youth" Part II*, (pp. 507 – 512). Tuzla: Association for creative development of children and youth.
- Šćepanović, M., & Kalinić, T. (2018b). What do practitioners say about inclusive education? Accepted for publishing in the Book of 5th International scientific Conference Proceedings 'Transformation towards Sustainable and Resilient Society for Persons with Disabilities'. Ohrid, 13th to 16th September, 2018. Skoplje: Institute for Special Education and Rehabilitation, Faculty of Philosophy.
- The Law on Foundations of Educational System. (2009). *Official Gazette of the Republic of Serbia*, No. 72/2009, 52/2011 and 55/2013
- The Law on Foundations of Educational System. (2017). *Official Gazette of the Republic of Serbia*, No. 88/2017 and 27/2018
- The Law on Preschool Education and Upbringing. (2017). *Official Gazette of the Republic of Serbia*, No. 18/2010 and 101/2017
- The Law on Primary Education and Upbringing. (2017). *Official Gazette of the Republic of Serbia*, No. 55/2013, 101/2017 and 27/2018
- The Law on Secondary Education and Upbringing. (2017). *Official Gazette of the Republic of Serbia*, No. 55/2013, 101/2017 and 27/2018
- The Law on Dual Education. (2017). *Official Gazette of the Republic of Serbia*, No. 101/2017
- The Law on Higher Education. (2017). *Official Gazette of the Republic of Serbia*, No. 88/2017 and 27/2018

- The Rulebook on Detailed Instructions for Determining the Right to an Individual Educational Plan, its Application, and Evaluation. (2010). *Official Gazette of the Republic of Serbia*, No. 76/2010.
- Wright, B. L., & Ford, D. Y. (2017). Untapped Potential. *Gifted Child Today*, 40(2), 111. Doi:10.1177/1076217517690862
- Ziegler, A., & Phillipson, S. N. (2012). Exceptionality and gifted education: a re-examination of its hard core. *High Ability Studies*, 23(2), 133-142. Doi:10.1080/13598139.2012.736221

ZAKONSKI USLOVI I NASTAVNIČKE KOMPETENCIJE ZA RAD SA DAROVITIM UČENICIMA U SRBIJI

Marinela Šćepanović¹ i Tanja Kalinić²

¹Društvo defektologa Vojvodine, Novi Sad, Srbija

²Srednja tehnička škola, Sombor, Srbija

Apstrakt

Cilj ovog rada je isticanje važnosti kontinuiranog profesionalnog razvoja kao jačanja nastavnika za rad sa nadarenim učenicima zbog toga što se oni ne osjećaju dovoljno kompetentnim za takav angažman. Pored toga, želeli smo da istaknemo glavne uslove za ovakav obrazovni rad koji su dati zakonom, u našem miljeu. Za potrebe ovog rada analizirali smo dostupne rezultate studija sprovedenih u našoj zemlji i šire, u vezi sa razvojem kompetencija nastavnika za rad sa darovitim učenicima, kao i postojeće zakonske uslove i druge kapacitete u Srbiji potrebne za rad u ovoj specifičnoj vrsti obrazovanja. Pregledali smo stručne i naučne studije koje su se bavile razvojem kompetencija nastavnika za rad sa darovitim učenicima. Većina istraživača otkriva i zaključuje da nastavnici imaju potrebu za dodatnim mogućnostima za stručnim usavršavanjem u nastavnim veštinama i ponašanju pri savetovanju učenika i roditelja i prilikom procenjivanja sposobnosti učenika, kako bi bolje razumeli razvoj darovitih učenika, unapredili svoje pedagoško znanje i stavove prema darovitim i talentovanim učenicima. Nastavnici darovitih učenika moraju biti otvoreni, fleksibilni, posedovati mnoga znanja u različitim disciplinama, moraju biti sposobni da koriste efikasne tehnike upravljanja u učionici, ali i biti veoma inteligentni. Potrebno je stvoriti Sistem profesionalnih standarda rada sa darovitim učenicima i Standarde za obrazovanja darovitih. U procesu analize zakona o obrazovanju darovitih učenika razmotrili smo pet novih obrazovnih zakona i njihov sadržaj vezan za darovite učenike. Analiza trenutnih zakonodavnih uslova i drugih kapaciteta u Srbiji pokazala je da su propisi pozitivni, ali nisu dovoljno konkretni, da nastavnici nemaju dovoljno znanja, iskustava i stručnog usavršavanja i programa u ovoj oblasti, nisu motivisani da se angažuju, a nema kreiranih profesionalnih standarda i standard za obrazovanje darovitih na nacionalnom nivou. Svi učesnici u školskom životu imaće koristi od promena u ovoj oblasti u bliskoj budućnosti, ali i drugi, takođe.

Ključne riječi: daroviti učenik, nastavnik, kompetencije, zakonodavstvo, standardi..

UDC 316.61-056.45
Original scientific paper

SOCIALIZATION OF A GIFTED STUDENT IN A CLASS¹

Rada Tadić¹ & Marijana Momčilović²

¹Gymnasium "Josif Pančić", Bajina Basta, Serbia

²Faculty of Philosophy, University of Novi Sad, Serbia

Abstract

Giftedness is a complex term that is not easy to define. Most of the research is focused on discovering giftedness and examining its structure and a small number of research deals with the issues of the process of the development of giftedness and the problems in practice which gifted children encounter and ways to overcome them. In the study we should start from the closest social environment of the gifted: family, school and peers. It is necessary to determine how gifted students are socialized and how they are accepted in the group in which they spend most of their time. To understand the complexity of social relations in a class we conducted a survey in which we used the sociometric method and obtained results on the status of a gifted student in the class. Research tasks determined is there a difference in the sociometric status of boys and girls in the class; in the sociometric status of students identified as gifted and others; are gifted children more often chosen for friends between themselves. The survey was conducted on a suitable sample, so the obtained results can not be generalized to the general population. However, they can be a significant complement to previously conducted research and starting point for new research into the sociometric status of gifted students. Sociometric status can greatly contribute to identifying and working with gifted students, but it is necessary to be supplemented with the results of other research techniques, and problematics is examined in a network of influences on a gifted child, as well as through the prism of all participants in the process of supporting a gifted child.

Key words: giftedness, socialization, sociometry.

¹ Ovaj rad je nastao u okviru projekta *Kvalitet obrazovnog sistema Srbije u evropskoj perspektivi* koji je finansiran od strane Ministarstva prosvete, nauke i tehnološkog razvoja .

Introduction

A school that seeks to respond to the demands of today's society must be inclusive, which means that its practice is to include all students - regardless of their talent, difficulty, origin or socio-economic background. It is an educational system that recognizes the individual potentials that students have and respond to all their individual needs, which is especially important when talking about gifted (Petković, 2009, cited in Momčilović, 2017). The determinants of giftedness are numerous and range from the equalization with high general intelligence (Terman, 1926, cited in Altaras, 2006) to contemporary theories according to which giftedness is seen as a multidimensional construct, composed of dynamic interaction of specific abilities, environmental factors and personality traits (Dai & Renzulli, 2008; Renzulli, 2012, cited in Nikolić, Grandić, Pavlović, 2017). One of the more general determinations is that giftedness (Čudina-Obradović, 1990, cited in Popović, Lazović, Milosavljević, 2016) is unusual and exceptional behavior, which is reflected in better, and significant results than other individuals with similar characteristics. When determining talent, Maksić (1998) points out that giftedness is a characteristic of personality, and that, in addition to intellectual abilities, also means creativity, concept of self, activity and commitment to a certain area, motivation (Popović, Lazović, Milosavljević, 2016). The authors (Ganje, Koren, Feldman) make the difference between giftedness and talent. According to them, talent is a type of developed talent in a particular area. Children can be both gifted and talented, but they can be both gifted without talent and conversely. Dabrowski claims that the potential for giftedness is inherited, but emphasizes the social role as an important factor for the occurrence and maintenance of giftedness (Tiller, 2002; Velb, 1988, cited in Milanović, 2017). Based on the aforementioned expert opinions, it can be concluded that talent is easier to identify in the artistic domain (visual, music and theater) and sports. Developing talents in all areas in which it is recognized implies systematic monitoring and encouragement, so that gifted people can gain competences that allow them to direct their abilities to a creative and high level of productive functioning (Arsić, 2016). Gifted children are children with special needs because their needs are different from the needs of their peers. For that reason, care for gifted children should be provided on all the levels - it should connect the whole living space of the pupil, meaning family, school and environment (Blažić, Stanojević, 2014).

Socialization in School Context

The peer community is a very important social environment in which a child lives and develops, and with his maturation, this world becomes a more important factor of his development. In the peer group, child learns to respect rules, learns how to share, helps and cooperates, achieves personal independence, develops socially acceptable behavior, teaches them how to accept socially acceptable goals. Students in socialisation process also meet the need for intimacy, acquire social skills and also form a picture of itself (Klarin, 2006). From all of the foregoing it is clear that

the child in the peer group is socializing, and that it is invaluable for his social and emotional development. In achieving satisfactory interaction between people from social environment, person must have developed social competences. Gifted children do not have relationships with their peers and schoolmates because of the very often expressed developmental differences, and therefore they have been denied the acquisition of social competences (Blažič, 2005). Some forms and mechanisms of psychosocial interaction during socialization have incentive or inhibitory influence to the manifestation of various activities. Facilitating indicates the positive effect of the presence of others, i.e. that the presence of groups or individuals leads to the improvement of individual activities, and inhibition is a form of interaction when the presence of others causes braking and regression in the realization of activities (Krnetić i Krnetić, 2005). The position of the child in the peer group and its sociometric status are of great importance for the development of every child, and in this paper we specifically based on the socialization of the gifted pupil and his specificity and characteristics as well as his sociometric status.

Klarin (2006) shows the model of Bukowski and Hosa who propose a model of peer relationships based on two dimensions, popularity and friendship in the peer group. Popularity refers to a one-way process and group relationships with peers and is defined as a "general, group-oriented and one-way construct that reflects peer's relation to a particular child" (Klarin, 2006, p. 56). On the contrary, friendship is a two-way process that is a mutual. A child has a need for belonging and proximity. The need for belonging is satisfied in the peer group, and the need for proximity in a relationship to a friend. The popularity of acceptance of a child by peers is described by two dimensions, acceptance and rejection. The degree of liking and attraction determines the acceptance and rejection, is determined by the degree of not liking and no sympathy. Klarin (2006) lists the division given by Newcomb and Bukowski, which refers to the degree of acceptance and rejection of a child by the peers. According to this division, there is a distinguished child, an isolated child, a controversial child, and a child "star". The rejected child has a lot of negative nominations, isolated a little negative, but few positive, and the child "star" quite positive nominations.

Gifted children are often isolated from their environment, because children look at them differently and often happens that they are truly isolated. While they are still in puberty and incompletely confident in their values, we should help gifted students to build a strong system of values and strong self-confidence that will enable them to boldly walk through life believing in themselves and the correctness of what they do, regardless of the reaction of the environment. Because the gifted are often unaccepted because of the lack of harmonization with the time in which they live and the fact that they practically live in front of their time" (Tomić, 2012, p. 57).

Cvetković Lay and Sekulić Majurec (2008) state that gifted children are often unfairly considered more popular in the group they belong to, while shy children are not often wrongfully included in the gifted individuals. The fact is that many gifted children have higher social intelligence, but not all gifted ones are the same. Among the gifted children, as well

as among others, there are those who fail to achieve good social relations with other children. Once a child is identified as gifted, it may become labeled in some way, which may also have a negative impact on their socialization. The positive characteristics of the gifted child are not always welcomed. Therefore the gifted child received the "gifted" label, the others received the label "average". Children who are not labeled as "gifted" can easily develop group solidarity, which can additionally have a bad influence on their relationship and socialization with gifted (Cvetković Lay, Sekulić Majurec, 2008).

Gifted children are aware of their difference, they are isolated, individuals and also often introvert. Often, inadequate socialization results in unaccepted behavior of gifted students. Such behavior is reflected in the fact that a gifted person is not able to develop all his potentials because of disturbed relationships with peers and other people, which is detrimental to both him and the environment. Analyzes of the maladjusted behavior of gifted people shows that it is most often caused by inadequate attitudes of the environment, leading to a crisis of identity. Anxiety that arises as a result of incompatibility to the environment can also be seen in mature individuals, but it is not a lasting character, because mature individuals are able to successfully find a solution to the discrepancy between personal needs and the demands of the environment. But in the period of adolescence, a child who is unable to adequately solve such requests often begins to behave improperly (Kostović, Đermanov, 1996).

Other problems which gifted encounter with are related to norms and standards that according to which the social community functions. Because of social pressure gifted become conformists, resulting in the loss of personal identity and creativity (Krnetić, Krnetić 2005). A gifted child can function at an intellectual level higher than his peers, but his emotional development may be at the level of his peers, which is why gifted child more often falls into the development crisis. Helping to get out of this crisis to a gifted child also refers to indicating that it is quite right to be different from his peers (Milutinović, Zuković, 2008, cited in Stojaković, 2001).

It is necessary to be cautious in using methods such as acceleration and skipping classes which, with all the benefits, can also have an adverse effect on the socialization of gifted children. Gifted children should have contact with peers by mental age and peers by calendar age. In socializing with their peers in mental age, they can further develop their specific interests, and in socializing with their peers of the calendar age, they realize the need for acceptance and the proximity that is very important for their socialization, because in this way they work with children of lower abilities and develop social skills (Tadić, 2016).

Methodology

Giftedness is a complex phenomenon and more and more attention is being given to it. However, despite the popularity of this problem and the number of authors dealing with this issue, the practice and concern for gifted individuals are still not at such a high level. It often happens that gifted

students, because of their talent, greater social and emotional maturity, are rejected both in society in general and in their classes among their peers. Gifted students, just like everyone else, want to be accepted, they feel the need for belonging and for communication with their peers. They want to participate and share roles. It is in a group of peers that they acquire social skills, develop and form their self-image. Gifted individuals are the basis for social and cultural prosperity and progress, and in order to treat them appropriately in a society, it is necessary for them to have an appropriate social status in groups in which they spend time, as well as in the wider social community. Bearing in mind the complexity of this issue, the subject of the research was to look at the sociometric status of a gifted student in a class.

Research goals and character: The research is empirical, and its goal was to look at the sociometric status of a gifted student in a class.

Research tasks: The aforementioned research goal was achieved on the basis of data obtained in accordance with the following tasks:

1. Determine whether there is a difference in the sociometric status of boys and girls
2. Determine whether there is a difference between the sociometric status of gifted students and students who are not identified as gifted
3. Determine whether gifted children choose other gifted children for their friends more often than children who are not identified as gifted.
4. Determine whether gifted children are more likely to be chosen by other gifted children rather than by children of lower abilities.

Methods, procedures and instruments: The research used the descriptive method. A survey technique was used to collect data, using a sociometric questionnaire with criteria of positive and negative choice.

Sample description: The research was conducted in June of the school year 2015/2016 on a random sample of 28 students of the second-grade class of gymnasium. In identifying the gifted students of our sample research, we used the data obtained from school's professional associates considering that giftedness is a complex phenomenon that requires long-term monitoring and analysis by multiple criteria. In "Svetozar Markovic" gymnasium special attention is devoted to the continuous work on identification of gifted and their development by including in enriched programs. The identification process is preceded by the phase of recognizing potentially gifted students. The carriers of this process are the school pedagogue and psychologist. There are differences among the gifted children, some of them are multitalented, and some are superior in certain areas, so a wider analysis is needed. Areas of study of giftedness are: general intellectual ability, specific school abilities, creativity, leadership abilities, artistic abilities. Student data is obtained on the basis of school achievement, results in competitions, activities in which students achieve above-average results, essays, presentations, checklists, questionnaires, observations, interviews with teachers, parents, students, school documentation. In the second phase, process of identification, different types of testing are used, for example, intelligence test, test of specific abilities, psychometric tests, individual tests, group tests. This phase aim is to single out individuals for which

we can with high probability claim that they are gifted. The third phase is working with gifted through an individualized program, additional classes, participation in sections, extracurricular activities, electoral programs, activities in cooperation with other institutions. Obtained data about gifted students were determined on the basis of the mentioned identification and monitoring phases within the school.

Data processing: The obtained data was processed by the procedure of descriptive statistics, and is interpreted according to the items from the instruments and presented in tabular manner using the NxN matrices and sociograms.

Results and interpretation

The obtained data was first processed and brought into relation with the set tasks, and for the sake of transparency, we determined that the data should be displayed through the NxN sociometric matrix, on the basis of which we calculated the indexes of the sociometric status for each student and also showed them in tables. On the basis of sociometric matrices for the criteria of learning and socializing, we made sociographs with categories of positive and negative selection.

As we already mentioned, the sample consisted of 28 students, one class of second grade of Gymnasium "Svetozar Markovic" from Novi Sad. Share of female respondents were 18 students (64%) and share of male respondents were 10 students (36%). Based on the results, it can be concluded that girls and boys have a balanced sociometric status. We have expected such results, because it is known that students of this age often choose children of the same sex for their friends.

Table1. NxN The sociometric matrix of socializing

N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	+	-
1	1									-			+																1	1
2		1																	+										1	1
3			1																	+							-		1	1
4				1																	+								1	1
5					1														+										1	1
6						1															+								1	1
7							1															+							1	1
8								1																					1	0
9									1										+										1	0
10										1																			1	1
11											1																		1	0
12												1																	1	0
13													1																1	1
14														1															1	1
15															1														1	1
16																1													1	0
17																	1												1	0
18																		1											1	1
19																			1										1	1
20																				1									1	1
21																					1								1	1
22																						1							1	1
23																							1						1	1
24																								1					1	1
25																									1				1	1
26																										1			1	1
27																												1	1	1
28																													1	1
+	2	2	0	2	0	2	0	3	1	2	1	2	1	0	0	0	2	1	3	1	1	0	0	0	1	0	0	1	28	
-	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	1	8	0	0	0	0	0	2	0	0	5	0	1	22	

The second research task was to determine the social acceptance or rejection of gifted students within the class. Table 1. *NxN The sociometric matrix of socializing* represents the presentation of mutual selection of students within the class according to the criteria of socializing. The table 1. shows the total number of positive and negative choices made by each pupil, as well as the total number of positive and negative choices for each individual by the other students in the classroom. Based on the sum of positive and negative choices for the socialization criteria, presented in the sociometric matrix, the acceptance index (AI), the rejection index (RI) and the social status index (SSI) for each student in the class are calculated and shown in Table 2. *Sociometric indices of socializing*.

Table 2. *Sociometric indices of socializing.*

N	AI	RI	SSI
1	0.07	0	0.002
2	0.07	0	0.002
3	0	0	0
4	0.07	0	0.002
5	0	0	0
6	0.07	0	0.002
7	0	0	0
8	0.11	0	0.004
9	0.04	0.18	-0.005
10	0.07	0	0.002
11	0.04	0	0.014
12	0.07	0	0.002
13	0.04	0	0.0014
14	0	0	0
15	0	0	0
16	0	0.04	-0.001
17	0.07	0.3	0.002
18	0.04	0	0.014
19	0.11	0	0.004
20	0.04	0	0.0014
21	0.04	0	0.0014
22	0	0	0
23	0	0.07	-0.025
24	0	0	0
25	0.04	0	0.0014
26	0	0.18	-0.006
27	0	0	0
28	0.04	0.04	0

In table 2. are shaded rows which represents gifted indices and numbered with: 2, 19, 22 and 28. In the methodological part of this paper is described how gifted are identified. Based on the data of the indices of acceptance, rejection and social status of gifted students for socializing as a selection criteria, it can be concluded that gifted students under numbers 2 and 19 have a high sociometric status, the social rejection index is equal to 0 while the pupil under the number 22 is neutral, no social rejection or acceptance, and the pupil under number 28 has an equal index of acceptance and rejection from peers in the classroom. If the indices of the social status of gifted students are compared with the indices of other students, we can conclude that there are no significant differences.

Table 3. *NxN The sociometric matrix of learning*

N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	+	-
1	1	+																											1	1
2		1																	+										1	0
3			1																	+									1	0
4				1																	+								1	1
5					1											+							-					1	1	
6						1														+		-						1	1	
7		+					1																					1	0	
8								1																				0	0	
9									1												+							1	0	
10				-						1															+			1	1	
11											1																	0	0	
12												1																0	0	
13		+											1															1	1	
14											+			1														1	1	
15	+														1													1	1	
16																1												0	0	
17																	1											0	1	
18								-			+							1										1	1	
19		+																	1									1	0	
20																												0	0	
21				+																								1	1	
22					+																							1	0	
23																												0	0	
24		+																										1	0	
25																												0	0	
26																												0	0	
27																+												1	1	
28		+																										1	1	
+	1	6	0	1	0	1	0	0	0	1	1	0	0	1	0	1	0	0	1	2	2	0	0	0	1	0	0	19		
-	0	0	0	1	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	2	2	0	0	3	0	1	33	

Table 3. *NxN The sociometric matrix of learning* represents an overview of the mutual selection of students within the class according to the learning criteria. Based on the sum of positive and negative choices, the sociometric learning indices are calculated and shown in Table 4. *Sociometric Learning Indices*.

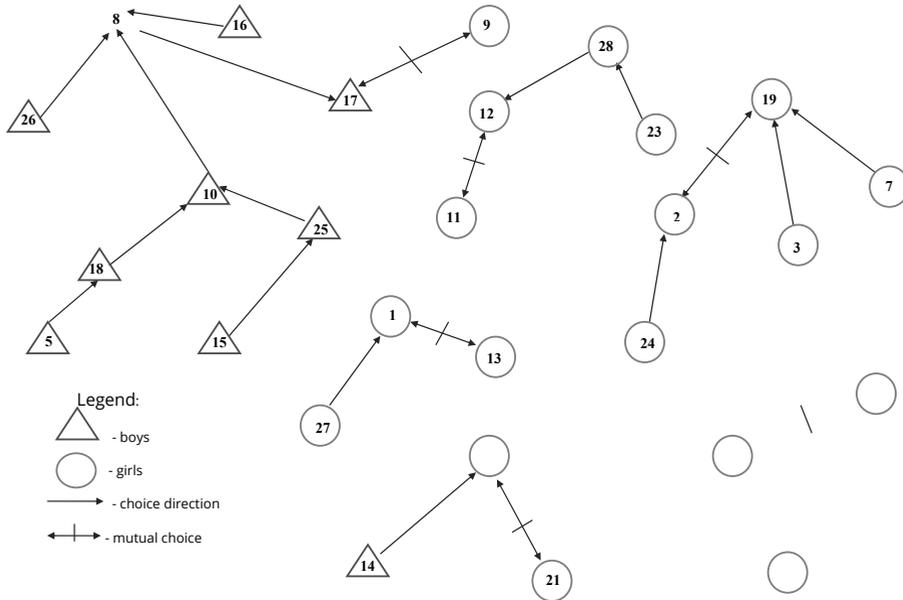
Table 4. *Sociometric Learning Indices*.

N	AI	RI	SSI
1	0.04	0	0.0014
2	0.22	0	0.008
3	0	0	0
4	0.04	0.04	0
5	0	0	0
6	0.04	0	0.0014
7	0	0	0
8	0	0.04	-0.0014
9	0	0.04	-0.0014
10	0.04	0.04	0
11	0.04	0	0.0014
12	0	0	0
13	0	0	0
14	0.04	0	0.0014
15	0	0	0
16	0.04	0	0.0014
17	0	0.04	-0.0014
18	0	0	0
19	0.04	0	0.0014
20	0.07	0	0.0025
21	0.07	0	0.0025
22	0	0.07	-0.0025
23	0	0.07	-0.0025
24	0	0	0
25	0.04	0	0.0014
26	0	0.11	-0.004
27	0	0	0
28	0	0.04	-0.0014

By looking at sociometric indices for the learning criterion, we can see that a pupil with identified giftedness has the highest acceptance index in the classroom (0.22). Therefore, this student was most often referred by the classmates for a person with whom they want to study. As a reason for that students emphasized that this student is good at explaining and knows how to pass the knowledge. In general, we can conclude by looking at the table 4. that there is no statistically significant difference between the social status of students identified as gifted and other students in the classroom, which once again confirmed that there is no statistically significant difference between the sociometric status of gifted students and those students who are not identified as gifted.

By the third research task, we wanted to investigate whether students often choose those students who are identified as gifted for their friends, rather than those who are not. And this is also linked to the fourth research task by which we wanted to examine whether gifted children are more often chosen by other gifted children for friends rather than by other students of lower abilities. In order to answer this question, we will focus on analyzing the socializing sociogram for both positive and negative choice. The analysis of choices in sociograms follows here.

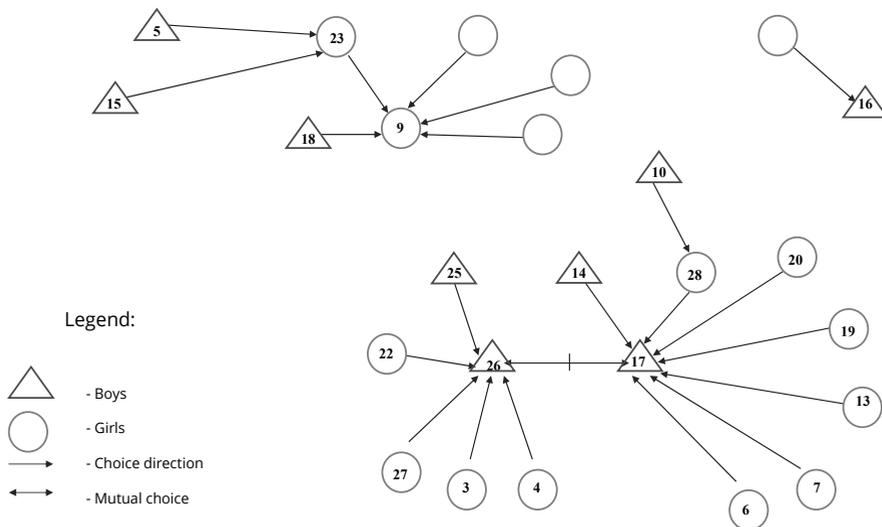
Sociogram 1. Socializing (positive choice)



In Sociogram 1. *Socializing (positive choice)* we can see that the highest number of positive votes (3) is given to a student under the number 19, female. This is a student that is identified as gifted and for whom we have seen, through an insight into sociometric indices, there is a highest index of sociometric acceptance. Positive choices for this student were from the same sex persons. There were 6 mutual choices (4 and 21; 6

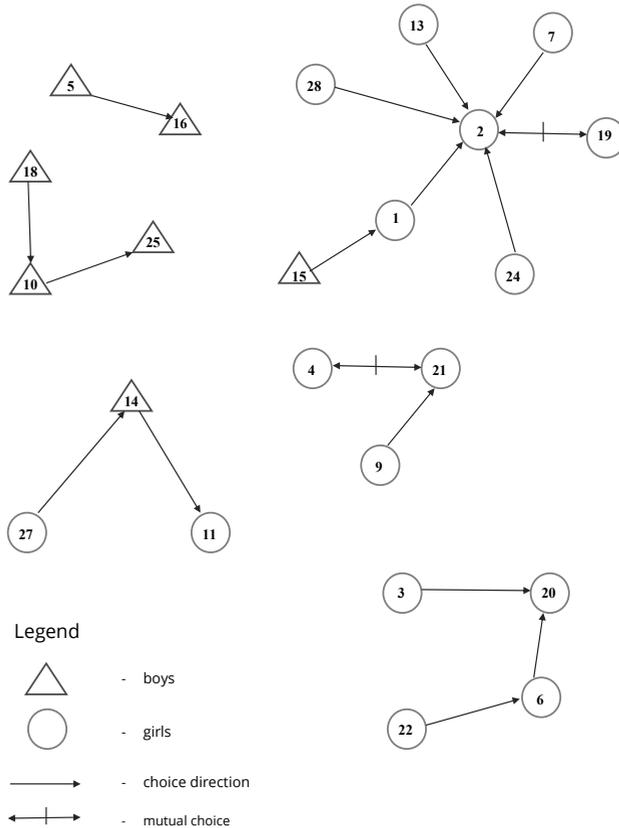
and 20; 11 and 12; 1 and 13; 17 and 9 and 2 and 19). It is noticed that one of the mutual choices was between students under numbers 2 and 19, both identified as gifted. We can see that a student marked by number 22, identified as gifted is also a female and had no positive choices. Our first research task positive choice between persons of the same gender was confirmed and we can clearly state for that on the basis of sociograms. The sociometric position of the male student under the number 14 is neutral in the group, and he had no positive or negative choices, and gave his positive choice to the female student under number 4. The student marked by number 19 had the largest number of positive choices (3), also as the student number 8, male gender. By analyzing the sociograms, we can conclude that students who are identified to be gifted (2, 19 and 28) in the overall ratio of positive choices are often chosen by other students, and the student marked by number 22 also identified as gifted did not have any positive choice.

Sociogram 2. Socializing (negative choice).



In order to get a more complete data for the criteria of socializing, we analyzed Sociogram 2. *Socializing (negative choice)*. If we start from the students who were identified to be gifted (2, 29, 22 and 28), on the basis of the sociogram we can conclude that the student marked by number 19 has no negative choices, as well as the student marked under number 2. Student marked under number 28 has one negative choice from a student of the opposite gender, and that is the boy at number 10. When it comes to the student marked by number 22, who did not have any positive choice, the same case is with the negative choices. These data can be identified analyzing Sociogram 2. *Socializing (negative choice)*, and once again we can say that students who are identified as gifted have no negative choices, only one of the gifted students, numbered with 28, has a negative choice.

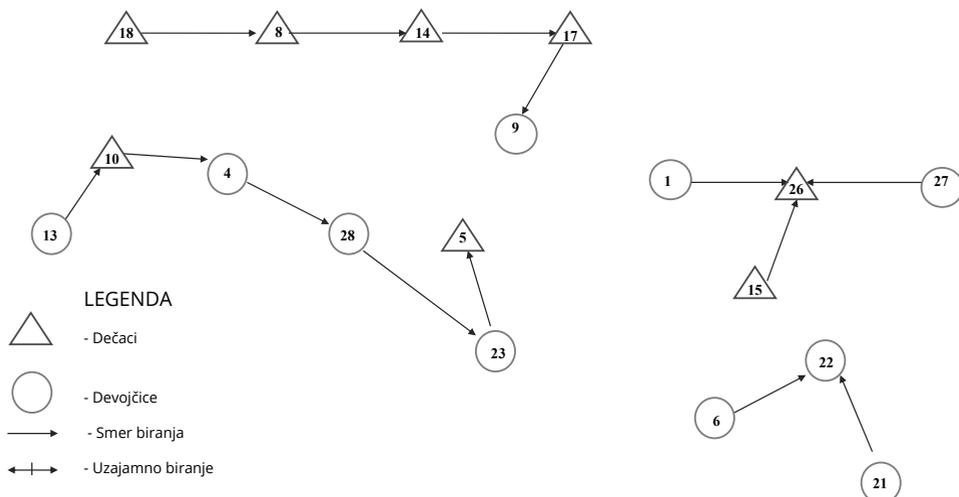
Sociogram 3. Learning (positive choice)



In order to see the sociometric status of both gifted and other students from our sample better, we consider it is useful to also analyze the data that can be found on the basis of sociograms related to the learning criteria. In the analysis of Sociogram 3. *Learning (positive choice)*, we notice that the most positive choices had the pupil marked by number 2 (6), that is a girl who is identified as gifted. There were two mutual choices (4 and 21; 2 and 19). We can see that mutual choice was between students marked under number 2 and 19 who are identified as gifted. And this was expected because gifted children are more inspired to work with children of similar intellectual abilities and tendencies. We can see that the student marked under number 28, who is also labeled as gifted, has no positive choices, but that her choice was the student at number 2. The student marked by number 22 has no positive choices, and later, through negative choices analysis, we shall see that she had even two negative choices. Based on other students states, and allegations of that student, as well we conclude that she prefers individual work more than teamwork. We see that positive choices for the criteria of learning of boys correlate fairly with their positive choices when it comes to the criteria

of socializing and that they prefer to study with students whom they are friends with. Among the boys, the student at number 10 has the largest number of positive choices, later we shall see, through the analysis of the data of the assessment of giftedness done by students, that he was often seen as gifted by other students, although he was not identified as gifted.

Sociogram 4. Learning (negative choice)



By examining the negative choices of students through Sociogram 4. *Learning (negative choice)*, we notice that the student at number 26, who had the largest number of negative choices also for the criteria for socializing, has the largest number of negative choices for the learning criteria (3) as well, follows, students marked by number 23 (2) and 22 (2) and have the largest number of negative choices. Therefore, the student at number 22, marked as gifted, has two negative choices, both from the students of the same gender. Attention is drawn to the fact that she received a negative choice from the student marked under number 6, whom she gave a positive vote. The reason for this can be the fact that she likes the independent work a lot, and that she is not ready for cooperation in a team work.

Discussion

In a critical review of the conducted research, we point out that limitation is that this research was conducted on a suitable sample. Namely, the sample consisted of only 28 students, one class of the second grade of High School. Therefore, when analyzing and interpreting the results obtained, one should be very careful and bear in mind that they can not be generalized to the general population. Therefore, in order to generalize the obtained results widely, it is recommended that a more represen-

tative sample should be included in future research, as well as a larger number of subjects in the sample, i.e. that they are not limited to only one classroom and to students of only one school. Such research is more suitable for conducting in schools where it is known in advance that there are gifted children in the classes. Usually such research is conducted among students of lower grades of elementary school, but it is necessary to also pay attention to this problem among secondary school students. It is well-known that gifted students are separated in homogeneous classes in some schools, so it would be interesting to look at this issue in such classes, and then compare the difference in the sociometric status of gifted students in homogeneous and heterogeneous classes. Also, it would be useful to complete such research with research related to teachers' attitude towards giftedness. Although they can not be ignored and considered insignificant, we consider that these shortcomings do not, however, diminish the value of the conducted research and the usefulness of the results obtained. One should not neglect the practical contribution of this research, i.e. the fact that the obtained results can have great practical implications at school, they can be used for the work of teachers and pedagogues with gifted children, as well as for new guidelines for identifying gifted students. We believe that it can nevertheless be not only an addition to some previously realized research, but also a starting point for some new research into the sociometric status of gifted students, and also in general research of the sociometric status of students in a group.

When it comes to the difference between the sociometric status of boys and girls, our assumption that there are no significant differences in the sociometric status turned out to be true. Such results were expected, as students of this age usually have friends of the same sex.

When it comes to the difference between the sociometric status of gifted students and those whose giftedness is not determined, after examining the sociometric matrices of the $N \times N$ for both of the selection criteria contained in our questionnaire and the sociogram analysis for the criteria of socializing and learning, it was established that there is no statistically significant difference between the sociometric status of gifted students and those in whom no giftedness has been established. The obtained results are contrary to the authors' assumptions that we stated in the theoretical part of the paper, which emphasized that giftedness significantly influenced the acceptance or rejection of gifted students in the peer groups. Of course, the results of the research depend on the group of students we are examining, from the culture of the school itself and from the sincerity of the students that can be difficult to influence.

When it comes to our third hypothesis that students choose gifted children for friends more often, it is partly confirmed, because with the insight into the sociogram of socializing it can be noticed that one of the students who falls into the category of gifted students has most positive choices, two students from this category have two positive choices, while one of the gifted students does not have any positive choice. When it comes to the learning criteria, distribution of positive choices is similar.

By the fourth hypothesis in the research, we have assumed that gifted often choose other gifted children for friends. This hypothesis is also

partly confirmed, by analyzing the sociogram of socializing we can see that there is just one of the reciprocal choices between the two students who are in the gifted group, while the other two students from the gifted group have directed their positive choices to other students in the class.

Although the sample of the conducted research is small for generalization, it is assumed that the research on the larger sample would have the same conclusion, which is confirmed by the data of the Majstorović research (2015). The sample of this research was 122 students in the third and fourth grade of primary school in Zagreb and the conclusions reached by the author are that: 1) there are no statistically significant differences in the sociometric status of boys and girls, 2) there is no difference between the status of gifted and those who have not been determined to be gifted, 3) that students prefer to choose friends more often because they give high societal status to students they consider gifted. The first two conclusions are the same as conclusions which we obtained from our research results, while the third is partially same.

The recommendation for further research is to examine whether pupils for gifted estimate those children who are identified as gifted. Also we should consider special categories of giftedness that fall into the art are neglected, as well as work on the identification of gifted students in these categories.

Conclusion

Socialization lasts throughout our whole life and is one of the basic factors for the development of a healthy personality. The peer world is a very important social environment for every child. In relationship with peers, the needs for closeness, socializing and belonging are met. In the paper we presented some of the problems and characteristics of the socialization of gifted children, as well as the causes of problems in their socialization.

When it comes to the socialization of gifted students, we consider that the underdeveloped techniques and research instruments of this issue are still a major problem. We were convinced of these difficulties by conducting this research. Bearing in mind all its limitations, we consider that this research can be a starting point for some other research and observations of this problem, and in the concrete practice in a school it can make a great contribution to identifying and working with gifted students.

Taking into account the data we have come up with as one of the questions that arises and which should be answered in future research is whether the practice is still such that the attention is focused exclusively on intellectual abilities and that they are at the first place, and that the specific categories of giftedness which fall into the arts are neglected. In the research we dealt with the socialization of students in a class, and it would also be useful to examine whether there is a difference in the socialization of gifted students in homogeneous and heterogeneous classrooms.

Reference

- Arsić, A. (2016). *Achievement identification and evaluation of musically gifted children in lower music school*. Vršac: Visoka škola strukovnih studija za vaspitače "Mihailo Palov".
- Blažić, M. (2005). Talentovani i socijalna sredina. *Daroviti i odrasli*, 124-130.
- Blažić, M., Stanojević, D. (2014). Teacher's understanding of giftedness. *Godišnjak Učiteljskog fakulteta u Vranju*, V, 87-100.
- Cvetković Lay, J., Sekulić Majurec, A. (2008). *Darovito je, što ću s njim?*. Zagreb: Alinea.
- Klarin, M. (2006). *Razvoj dece u socijalnom kontekstu*. Jastrebarsko: Naklada Slap.
- Kostović, S., Đermanov J. (1996). Teorijsko-metodološki problemi proučavanja socijalizacije darovitih. *Godišnjak Filozofskog fakulteta u Novom Sadu*, 24, 268-275.
- Krneta, D., Krneta Lj. (2005). Daroviti u očima drugih. *Daroviti i odrasli*, 133-150.
- Majstorović, I. (2015). *Sociometrijski status učenika u razrednim odeljenjima* (diplomski rad). Zagreb: Filozofski fakultet.
- Milanović, A. (2017). Teorije o darovitima. *Godišnjak Pedagoškog fakulteta u Vranju*, VIII, 191-201.
- Momčilović, M. (2017). *Inkluzija u očima nastavnika*. Beograd: Zadužbina Andrejević.
- Nikolić, M., Grandić, R., Pavlović, M. (2017). Kompetencije vaspitača za rad sa darovitim decom. *Inovacije u nastavi*, XXX, 43-54.
- Popović, D., Lazović, M., Milosavljević, Ž., (2016). Podrška razvijanju darovitosti u školskoj praksi. *Inovacije u nastavi*, XXIX, 73-83.
- Stojaković, P. (2001). Pogrešne predstave i pogrešna verovanja o darovitim učenicima i studentima. *Darovitost u studentskoj populaciji*, 7, 121-130.
- Tadić, R. (2016). *Sociometrijski status darovitog učenika u odeljenju* (master rad). Novi Sad: Filozofski fakultet.
- Tomić, O. (2012). *Talenti, Okruženje implikacije za kreiranje strategije podsticanja razvoja darovitosti kod učenika*. Novi Sad: Pokrajinski sekretarijat za sport i omladinu.

SOCIJALIZACIJA DAROVITOG UČENIKA U ODELJENJU

Rada Tadić¹ i Marijana Momčilović²

¹Gimnazija „Josif Pančić“, Bajina Bašta, Srbija

²Filozofski fakultet Univerziteta u Novom Sadu, Srbija

Apstrakt

Darovitost je kompleksan pojam koji nije jednostavno definisati. Većina istraživanja je usmerena na otkrivanje darovitosti i ispitivanje njene strukture, a mali broj istraživanja se bavi pitanjima samog procesa razvoja darovitosti i problema sa kojima se u praksi susreću darovita deca i načinima za njihovo prevazilaženje. U proučavanjima treba krenuti od najbližeg socijalnog okruženja darovitih: porodice, škole i vršnjaka. Potrebno je utvrditi kako su daroviti učenici i na koji način socijalizovani i prihvaćeni u grupi u kojoj provode najviše vremena. Kako bismo uvideli složenost socijalnih odnosa u odeljenju, sproveli smo istraživanje u kome smo koristili sociometrijsku metodu i dobili rezultate o statusu darovitog učenika u ode-

ljenju. Zdacima istraživanja smo hteli da utvrdimo postoji li razlika u sociometrijskom statusu dečaka i devojčica u odeljenju; postoji li razlika u sociometrijskom statusu učenika koji su identifikovani kao daroviti i ostalih učenika, da li darovitu decu za prijatelje češće biraju druga darovita deca od učenika nižih sposobnosti. Istraživanje je sprovedeno na prigodnom uzorku, pa smo stoga svesni da se dobijeni rezultati ne mogu generalizovati na opštu populaciju. Međutim, mogu biti ne samo značajna dopuna ranije obavljenim istraživanjima, već i polazna tačka novim istraživanjima sociometrijskog statusa darovitih učenika. Sociometrija može dati veliki doprinos identifikaciji i radu sa darovitim učenicima, ali je nužno da bude dopunjena i rezultatima drugih istraživačkih tehnika, kao i da se ova problematika sagleda u mreži uticaja na darovito dete kao i kroz prizmu svih učesnika u procesu podrške darovitom detetu.

Ključne reči: darovitost, socijalizacija, sociometrija.

UDC 159.922.3-056.45

Review paper

PERFECTIONISM IN GIFTED

Does perfectionism have a good face?

Lada Marinković

Preschool Teacher Training College, Novi Sad, Serbia

Abstract

Perfectionism in psychology is most commonly defined as a personality trait characterized by striving to achieve extremely high standards accompanied by accentuated self-criticism and fear of negative external evaluation. As a multidimensional construct, perfectionism has its positive and negative aspects. As maladaptive and negative, perfectionism is recognized through person's needs to achieve the unachievable, thus, person develops certain form of psychopathology (depression, anxiety, OCD etc.). Adaptive and positive, it appears as a stimulus and motivation of a person to progress, advance and strive to fulfill highly set goals and ideas, thus the person feels satisfaction along the process.

In a group of gifted, perfectionism is often seen as a consequence of awareness of their own developed intellectual characteristics or the experience of high achievements in a particular domain. Awareness of person's high potentials, leads towards achieving high goals. In that sense, perfectionism in gifted often appears as an adaptive mechanism, based on the real assessment of one's capabilities. Requiring the gifted to achieve high results, to be better and / or do better is most often a way to motivate and bring feeling of happiness to a person while working and advancing. Setting high expectations is never a demotivating or depressing factor.

The aim of this paper is to point out the relationship between perfectionism and giftedness and to explain positive aspects of perfectionism. Simultaneously, while analyzing positive aspects, methods in which children and young adults can learn how to set realistic expectation from themselves and others will be highlighted as well as methods on how to learn not to be afraid of mistakes, but to expect, respect, investigate and correct them. The role and importance of adults in this process is necessary.

Key words: perfectionism, adaptive perfectionism, giftedness, fear of mistakes, fear of failure

Introduction

To have high expectations, from oneself or others, to achieve highly set goals in a way which will satisfy our inner standards of sufficiency and the sense of success of achieved, for different persons represents different process with various outcomes. For ones, it is a way to feel good, enjoy the work and enjoy trying out advanced and different ways to achieve something, learn and in that manner, improve themselves, while for the others, that same process represents only the beginning and the source of suffering, loss of self-confidence, constant concern, dissatisfaction and non-productivity. Messages like: "Be perfect, "I have to be perfect" as opposed to "Strive for better, strive for finding different solutions", represent the difference in cognitive styles and are messages we direct to ourselves, which will later form and be the foundation of the type of our perfectionism.

Perfectionism is most commonly defined in psychology as a personality trait characterized by the pursuit of achieving extremely high standards, followed by accentuated self-criticism and fear of negative external evaluation. As a multidimensional construct, perfectionism has its own positive and negative aspects. As a maladaptive and negative, it is recognized through person's requests to reach unattainable, thus, a person develops some form of psychopathology (depression, anxiety, OCD, etc.). As adaptive and positive, for a person it represents as stimulus and motivation to progress, strive to achieve high goals and ideas, and he feels satisfaction along the process.

In a group of gifted, perfectionism is often seen as a consequence of awareness of their own developed intellectual characteristics or the experience of high achievements in a particular domain. Awareness of person's high potentials, leads towards achieving high goals. In that sense, perfectionism in gifted often appears as an adaptive mechanism, based on the real assessment of one's capabilities. Requiring the gifted to achieve high results, to be better and / or do better is most often a way to motivate and bring feeling of happiness to a person while working and advancing. Setting high expectations is never a demotivating or depressing factor.

The aim of this paper is to point out the relationship between perfectionism and giftedness and to explain positive aspects of perfectionism. Simultaneously, while analyzing positive aspects, methods in which children and young adults can learn how to set realistic expectation from themselves and others will be highlighted as well as methods on how to learn not to be afraid of mistakes, but to expect, respect, investigate and correct them. In addition, goal of this paper is to indicate the characteristic of perfectionism in gifted and the possibility of educational influence of the environment on the development of perfectionism that does not lead to the abandonment of goals, the fear of error and failure and other undesirable psychological and psychopathological manifestations of behavior. The role and importance of adults in this process are unavoidable.

Even though, perfectionism is often defined as an individual's tendency to set unrealistically high and unachievable goals in various domains, its other side is unfairly neglected (Hewitt & Flett, 1991. in Kolić-Vehovec

2003). This paper will depict and explain perfectionism as a personality trait that does not necessarily have to be seen in negative light.

What Do We Know About Perfectionism

Perfectionism, we can undoubtedly say, has two faces. One that shows high, but unrealistic expectations from one self, from others and focus on mistakes. And other face, the one that reflects high expectations for which person makes additional effort, continues to work on the problem despite mistakes and feels satisfaction, regardless of the achievement of the goal – which in this case is usually attained.

In professional literature, perfectionism is recognized not only as a characteristic of human behavior that is related and visible in various fields of action, clinical manifestations, psychological and physical health disorders, but also as a characteristic and trait that does not have only negative connotation but has adaptive manifestations as well.

As any other personality trait or manifestation of human behavior, perfectionism also contains a whole spectrum of characteristics that vary from person to person and can, in different combinations of individual traits, have positive and negative sides.

Unlike the initial and traditional concept of perfectionism as a one-dimensional construct and personality trait that manifests itself predominantly through negative cognitive emotional and behavioral characteristics, from the end of 20th century, perfectionism is more and more considered as a multidimensional construct/multidimensional characteristic. It is considered as a much more complex concept, and recently even as a construct that has positive manifestations. Thus, Slaney, Ashby and Trippi (Slaney, Ashby & Trippi, 1995), indicate that it is necessary to examine the positive sides of perfectionism. Hamachek (Hamachek in Flett, Hewitt, 2002), introduces differentiation between so called normal and neurotic perfectionism. "Normal perfectionists" set realistic, and attainable goals, whilst feeling satisfied and staying confident. "Neurotic perfectionists" set extremely high and unattainable goals; their standards of achievement are estimated through the prism of constant fear of failure, and through concerns about possible negative assessment of others.

Even when they reach a certain goal, they do not feel the satisfaction, but they judge themselves, considering they could have and should have done better.

As a multidimensional construct, perfectionism can be perceived through several dimensions and factors. Their number varies from author to author. Frost (1990, in Flett, Hewitt, 2002) notes six dimensions: high personal standards, insecurity in person's own activity, constant concern about the possibility of mistake, desire for order and structure, high parental expectations and parental criticism. It is apparent that first four factors depict our traits, while the role and significance of immediate environment and parenting styles are reflected in the last two. Other authors (in Flett, Hewitt, 2002) cite three dimensions of perfectionism: Self-oriented, Other-Oriented, and Socially Prescribed. The essential difference between these dimensions is the direction of behavior. Self-Oriented perfectio-

nism, refers to the setting of unrealistic goals, doubt in one's actions and focus on errors and failures. This dimension is more related to the desire for achievement than to the fear of failure. Other-Oriented perfectionism refers to unrealistic beliefs in the abilities of others and high expectations of them, as well as to an extremely rigorous assessment of what has been done. This form of perfectionism is visible through the expectations and beliefs that person has about others. High expectations are set for others, they are expected to be perfect, and they are being sharply criticized for any deviation from the set goal. Socially Prescribed Perfectionism represents a consequence of the fear of failure that is connected to the negative evaluation from others and social anxiety. It includes beliefs that other have unrealistic expectations from us, fear of negative social evaluation and strong need to be recognized by others as good and successful (Lauri Korajlija, 2005., in Grabar, 2005.). Socially Prescribed Perfectionism refers to beliefs that others have unrealistic expectations from a person. In that case, the person has the feeling that he must attain the goals in order to get the approval and acceptance. Person with this dimension of perfectionism has the feeling of the lack of control, pressure to satisfy others' expectations and he consequently develops low self-esteem whilst identifying the achievement and high results in some work domain with his own value as a human being. Some petdond, nevertheless see this form of perfectionism as a motivation for improvement (Hamachek, 1978.; Roedell, 1984.).

Hewitt and Flett (1991. in Kolic-Vehovec 2003) are establishing certain connections between self-oriented perfectionism and resourcefulness and general and constructive aspirations. On the other hand, this dimension of perfectionism may, in interaction with experiencing frustration and failure, form depressive reactions and depression.

One other aspect of understanding perfectionism is important for this topic. Namely, studies on this topic demonstrate that perfectionism could be viewed as a generalized characteristic but also as a specific form of relationship towards one's achievements only in certain aspects of life. Mitchelson and Burns (1998, in Flett, Hewitt, 2002) asked the respondents to evaluate perfectionism related to work and family relationships. It was statistically shown that levels of perfectionist dimensions were significantly higher for work related activities rather than perfectionism that respondents demonstrated in relation to family relationships and behavior at home. This practically means that it is possible to be a perfectionist in relation to certain spheres of life and activities, as well as that perfectionism as a feature can be expressed only in certain roles and situations in which a person operates.

What is also confirmed by the laic understanding of this concept is that perfectionism can be a consequence of low self-confidence.

Perfectionists are mostly recognized through self-criticism which is shown in regards to each of their actions and the belief that nothing is and never will be good enough. The words: „ I should have “, I had to “, „ I shouldn't have“ are a direct introduction to the feeling of inferiority, over-generalization in concluding and other unconstructive and unpleasant feelings.

Adaptive and Maladaptive / Desirable and Undesirable / Healthy and Unhealthy Form of Perfectionism

Unlike observing perfectionism solely as an undesirable characteristic, today, different authors, label with different names two modalities in which perfectionism can be manifested. First, they call neurotic, maladaptive, dysfunctional and second adaptive.

Hamachek (1978) suggested that two forms of perfectionism can be differentiated: a positive form labeled „normal perfectionism“, in which individuals enjoy pursuing their perfectionistic strivings and a negative form, labeled „neurotic perfectionism“, in which individuals suffer from their perfectionistic strivings.

Even though these two forms have different labels, namely positive strivings and maladaptive evaluation concerns (Frost, Heimberg, Holt, Mattia, & Neubauer, 1993 in Stoeber, 2006), active and passive perfectionism (Adkins & Parker, 1996. in Stoeber, 2006), positive and negative perfectionism (Terry-Short, Owens, Slade, & Dewey, 1995. u Stoeber, 2006), adaptive and maladaptive perfectionism (Rice, Ashby, & Slaney, 1998. u Stoeber, 2006), functional and dysfunctional perfectionism (Rhéaume, Freeston, et al., 2000. in Stoeber, 2006), healthy and unhealthy perfectionism (Stumpf & Parker, 2000. in Stoeber, 2006), personal standards and evaluative concerns perfectionism (Blankstein & Dunkley, 2002. Stoeber 2006), and conscientious and self-evaluative perfectionism (Hill et al., 2004, in Stoeber 2006), there is agreement that perfectionism can also be positive.

Two basic dimensions of perfectionism are common: *perfectionistic strivings and perfectionistic concerns*, and both can be healthy or unhealthy.

Normal perfectionists are individuals who show high levels of perfectionistic strivings, but are not overly distressed by the issues that are combined in the dimension of perfectionistic concerns, namely concerns over mistakes, doubts about actions, feelings of discrepancy between actual achievements and high expectations, self-criticism, and the fear of failure to live up to one's own standards and to the high expectations of others (Stoeber, 2006). In contrast, neurotic perfectionists show high levels of perfectionistic strivings and are overly distressed by the issues combined in the dimension of perfectionistic concerns. Thus, perfectionistic concerns may be the factor that distinguishes clinical forms of perfectionism from a healthy pursuit of excellence (Shafran et al., 2002; see also Dunkley et al., 2006. in Stoeber, 2006).

It is visible that there are components of perfectionism that have positive and adaptive function as well as ones that contain neurotic and maladaptive function. Characteristics of adaptive perfectionism are existence of high personal goals, discipline and focus on work and structure. It is particularly emphasized that setting high goals with belief that the person has the abilities for their achievement is a fundamental distinction in relation to maladaptive perfectionism. In the study of Pajares and Kranzler, (1995., in Kolić-Vehovec 2003) it is proven that students who have developed a positive attitude towards their abilities, and handling school tasks are achieving better results. In addition, if the goals are set in terms of desire and not in form of the imperative "having" to meet the goal, inve-

sting in the process of solving a task represents a new challenge rather than a source of fear, anxiety and a cause of loss of self-confidence.

Per Pyryt (2004) a typical sign of perfectionistic thinking is dichotomous (all-or-nothing) thinking in which a person wants a project to be either perfect or considers it worthless. Further indicators of perfectionistic thoughts are transforming desires (wants) into demands (musts), and focusing on unmet goals and challenges rather than successes. These characteristics may be combined with intense anxiety and fear of making mistakes, preoccupation of deceiving others, as well as doubts about actions

Perfectionism in its negative form is to a large degree related to the fear of mistaking. Subjective perception that we haven't in sufficient measure achieved preset (unrealistic goals) represents an additional source of stress, so it further continues to have a negative effect on our health, both physical and mental. Numerous studies, in that sense, confirm the liaison between perfectionism, depression and anxious disorders (Hewitt, Dyck, 1986), between perfectionism and eating disorders (Lask, Bryant, 1992), between perfectionism and suicide (Callahan, 1993). But it would be wrong to conclude that perfectionism itself is the answer to the question of what is the cause of mentioned disorders, mental states and behaviors.

Neurotic perfectionists are focused on imperfections and failures from the past, they exagurated them and are very self-critical, and they compare their own personal value with the success in task fulfillment (Onwuegbuzie & Daley, 1999., Hayard & Arthur, 1998. in Kolić-Vehovec, 2003). Because of the above mentioned, they have low self-confidence.

There is a clear connection between neurotic perfectionism with low self-esteem, feeling of shame and guilt, indecisiveness, lack of social skills and anxiety (Hayward & Arthur, 1998, in Kolić-Vehovec, 2003).

Positive perfectionists do not estimate their value in accordance to the result of their activities, and they do not consider failure as a sigh of their weakness or flaws. Failure for them represents the need to improve their investment, concentration, effort, or to change the approach strategy in achievement of goals (Slade & Owens, 1998 in Grabar, 2005). It has been shown that people who achieve high performance results approach the task relaxed, they execute it with attention and they stick to their plan. Also, they accept their mistakes, and they are not rigid in relation to the pre-set goal. They constantly adapt the criteria for their success to the given situation, but are also realistic in observing their own abilities (Flett & Hewitt, 2002).

Positive perfectionism is in a positive correlation with school grades (Brown et al. 1999). Namely, besides high goals it is necessary that a person believes in the possibility of reaching the goal. Students who consider that they are highly effective and believe in their abilities, accomplish better school results (Pajares, Kranzler, 1995).

How Do We Become Perfectionists?

The idea that perfectionism is most probably learned and formed in the earliest childhood under the influence of significant adults in the child's environment, is encouraging because it leaves the possibility of

preventive work. Model of the development of perfectionism which is suggested by Flett and associates (Flett & assoc. 2002), indicates the importance of parental and environmental influence but also personal characteristic such as temperament and forming style of affective attachment. Differences in the expression of these elements lead to differently developed earlier mentioned dimensions of perfectionism. Most researchers have stressed that the family environment, and particularly the parents, play a crucial role in the development of perfectionism (e.g., Blatt, 1995; Hamachek, 1978; Pacht, 1984; Shafran & Mansell, 2001. in Stoeber, Otto, 2006). Besides parental influence, other adults as teachers, professors, tutors and wider social community, as well as its values, play an important role. This comprehensive model of development of perfectionism includes self-activity of the child in setting goals as well as seeking feedback on their success from others.

Harsh parenting (parental overprotection, lack of care, critical parenting, and parental pressure to be perfect) emerged as a developmental antecedent of negative perfectionism. Perfectionistic parenting (parental pressure to be perfect and high parental standards) emerged as a developmental antecedent of both positive and negative perfectionism (Stoeber, Otto, 2006).

Studies have found that children with high levels of perfectionistic strivings (personal standards, self-oriented perfectionism) tend to have parents who also show high levels of perfectionistic strivings. This relationship seems particularly strong when parent and child are of the same gender (Frost, Lahart, & Rosenblate, 1991; Soenens, Elliot, Goossens, Vansteenkiste, Luyten, & Duriez, 2005; Vieth & Trull, 1999 in Stoeber, Otto, 2006). This may indicate that modeling by parents may play a role in the development of positive perfectionism (Hamachek, 1978), but genetic factors should not be overlooked either as a recent twin study found high heritability values for perfectionistic personal standards (Tozzi et al., 2004 in Stoeber, Otto, 2006).

From the angle of psychodynamic theory and Transactional analysis as psychotherapeutic modality, perfectionism is visible in the life script of a person, through drivers, unconscious initiators of transactions or behaviors which are formed in the early childhood under the influence of messages received from important adults, most commonly parents. "Be perfect", "Try hard" and other unconscious initiators of our behaviors are forming convictions that no matter how hard we try and work, achieved success is never good enough, thus a person aligns his own value as a being with achievement in certain domain. Such setting leads to perfectionism that is maladaptive. However, theory of transactional analysis also takes into the consideration that there is a difference between driven behavior and life script repetition from healthy and authentic drive to achieve high results (Clarkson, 2002). Main difference is defined only through the attainment. Unhealthy perfectionism is reflected in constant dissatisfaction with achievements, while healthy perfectionism is reflected in satisfaction with the process of improvement despite mistakes, as well as in satisfaction that is brought to the person while working on the solution of the problem or movement towards the set goal.

When a person is under the influence of driver: *Be perfect*, he strives for perfection, or he expects the same from others. He can easily be recognized for saying more than needed or what is expected of him believing that in that way he is ensuring enough information so that others would understand completely. He believes that if he is not perfect, he is not OK. Thing that can enable the change of this conviction is a message to the person that he is OK just the way he is. A person does not identify himself (as a being) with what he achieves (doing), (Clarkson, 2002).

Perfectionism in Gifted

Persons with highly developed abilities are setting high expectations for themselves, but the environment itself is expecting from them more than from persons with average abilities. There is a question on how to measure what is the unrealistic goal for gifted children? Different studies which examine perfectionism in gifted give different results. Besides the opinion that this trait is often demonstrated in gifted (Webb, Meckstroth and Tolan 1982 in Heller et al. 2000), numerous others are indicating that even though tendency to perfectionism in gifted can exist, it will by preference be healthy and positive motivation for achievement which doesn't trigger depression, but the feeling of content while advancing (in Flett, Hewitt, 2002).

Considering that gifted become aware of their own high abilities at a very young age, it is most probable that they will start developing high expectations from themselves at this early age. However, gifted are often not gifted in all areas of their functioning, so high expectations in one area can be conveyed to expectations to be successful in all fields, which can become a source of frustration. Silverman (1995, per Peters 1996., in Kolić-Vehovec, 2002) considers perfectionism as a result of those inconsistencies. It is not easy to show excellence in one field and to be like the majority in others, or even below average. This is not easy to accept neither to cognitive nor intellectually advanced children.

With gifted children, perfectionism is visible in their reliability, conscientiousness, organization and planning. These children learn very early how to systematically approach the sphere of their interest.

A particularly important field is the relationship of parents towards the high abilities they recognize in their children. Ablard and Parker (Ablard, Parker, 1997) confirmed that parental perfectionism is responsible for perfectionism of gifted children. It is not rare that parents of gifted are very demanding and they expect perfect results from their child, which child later identifies with parental acceptance (Leroux, 1989). Believing that child should work hard in order to use his talent, or gift, his time is organized solely with the goal of advancement in the area of giftedness, while other needs are being put aside. Consequently, child starts believing that hard work and improvement can be confirmed through achievement, which will be rewarded with parental love. Child could, at the same time, give up on his own authentic wishes and aspirations and work only for the external praise. Unreasonably high expectations and insensitivity to other children's emotional needs or interests, even by the pedagogue that works with the child, can form perfectionist expectations with the child itself.

As the result, of all things mentioned, gifted see their goals as something they must achieve, and not as their wishes that could be achieved. Constant request for excellence which is forced upon them, brings them to being overloaded, tired and resistant towards the gifted field, and they even refuse to engage in any other activities that require any kind of effort or engagement. Sometimes, gifted can develop a belief that they are not that successful and that their mediocrity will eventually be uncovered.

In this case, perfectionism can bring the child to the fear of failure, causing a child who is genuinely gifted to avoid engaging in solving even an easy task. Gifted can sometimes, before answering, ask for numerous details, to be sure that they understood all elements in order to be able to give an adequate answer, which makes them shy and withdrawn in social situations. Their reaction to criticism can be turbulent, even aggressive, because they are experiencing it very personally. Developed sensitivity to justice, to good and bad, and the ability to perceive and understand problems in their environment can make them introvert, closed, sometimes even depressed.

Nevertheless, studies of the frequency of perfectionism in gifted children and children with average abilities show that there are only very small differences. Perfectionism is even somewhat less demonstrated in the group of gifted (Parker and Mills. 1996., per Flett, Hewitt, 2002., in Kolić-Vehovec 2002). Also, no significant differences between genders were found. It is confirmed that one part of children who have perfectionism which represents a problem, with time become perfectionist of maladaptive form (Parker, 1997., per Flett, Hewitt 2002). In most of the cases, gifted, however, manage to bear the burden of their gifts without expressing fear of failure and development of, above all, a perfectionistic attitude towards themselves.

The influence of parents on the development of perfectionism

Parental behavior, value modeling, attitude towards work, achievements, mistakes and failures is highly important in forming the perfectionism in children. High parental expectations often create pressure on the child and increase his anxiety (Siegel 1987, in Flett, Hewitt 2002). Thus, the parental upbringing style largely influences the formation of this trait. Messages that child explicitly or implicitly receives from his parents, will form his attitude towards success and failure. What kind of confidence will the child have while working on achievements of his goals depends on whether the child is going to think of mistakes and misunderstandings as expected and constituent parts of the progression process in achieving results, or he will look at mistakes and failures as inadmissible or even "obvious" indicators of his successes or inadequacies - what is my talent when nothing I do goes easily, nor successfully?

In that sense, we can distinguish focus on development, growth, learning and process or focus on results, grades, awards.

Like the influence of parents, the influence of institutions such as school emphasizes one of mentioned focuses. It is obvious, that the one which steers to processes and not results is the one that builds healthier,

more preferable and adaptive forms of perfectionism. Unfortunately, competences and focus on results are still dominating the educational system.

The question whether parents should seek professional help, if their child is inclined to develop a maladaptive form of perfectionism depends on the degree of perfectionist demand and to what extent this tendency leads to other problems in emotional sphere - development of some psychopathological personality disorders such as, social isolation, panic attacks, eating disorders or depression.

How to Prevent Development of Dysfunctional Perfectionism and Fear of Failure and Error

In order to create healthy attitudes towards oneself, one's abilities, persistence in achieving set goals, to realistically perceive mistakes and to adequately respond to failure, it is primarily important to form healthy attitudes to oneself, belief of self-esteem and self-confidence. For basic confidence, it is necessary that a person believes he is valuable regardless of the results and achievements, and to at the same time be motivated for self-improvement and advancement in accordance with his own abilities.

Therefore, two tasks are important: one to build a positive attitude toward one's being, and the other to adopt the skill of setting realistic goals and relations to the process of progress as a path where success and failure take turns. For a child, it is important to receive unconditional messages of accepting him as he is, but it is also important to receive messages about realistic attitude toward failure. This can easily be illustrated in examples of messages that can be heard from parents on the playground. Message "Let's do it again" is different than the message "Come on do it differently". "You will fall" against "Watch it", "It's okay to be sad/angry. You can continue to try ..."; "bravo, you're a genius" vs. "bravo, you've worked hard and you did it", "you can do it." These messages teach the child various important lessons for healthy self-confidence and motivation towards achievement

Perfectionistic thinking is manifested through so called: „ I have to – I must “. „all or nothing“ thoughts and overgeneralization (“Everything has failed”, “I can never do anything right”, “I never succeed”). Instead of using these phrases, it is important for a person to learn how to differently address himself: „ I will do it the best way that I can“, „ it is okay to make mistakes“, „not all is bad“, „ something is good, something should be corrected“, „ I can go step by step from the beginning“, „ I will do it again“, „ if I continue to grow, chances are I will succeed“. Phrase where words „should“ and „must“ are replaced with „ I want“, „ I'd like to“ , immediately get a motivational signification and the person takes authentic responsibility for what he has said.

Attitude towards mistakes is particularly problematic for perfectionists. For that reason, it is important to teach a child that mistakes are expected and to teach him to consider mistakes as an unavoidable step in the process of learning and advancement. Mistakes are meant to be examined and it is important for a child to comprehend how the mistake occurred; whether

he made a mistake, or he just did not take into account some important circumstance or, it was the case of a series of circumstances that in that particular moment led to not such a good result. The most important step is to teach a child to stay motivated to correct the mistake. One thing that seems as a mistake to a perfectionist in one moment (due to overgeneralization), can ruin all the effort, sometimes life, could be just in few days or years perceived completely differently. Therefore, it is important to learn that mistake assessment and their meaning change over the time.

In addition, another characteristic of perfectionists is to unfairly neglect the successes and positive aspects of their actions. While thinking "all or nothing", one mistake can prevail over numerous positive elements of invested effort. Using the conjunction "but" after every statement that evaluates the failure, can be of help in changing this way of thinking ("Today I was really bad at training, but... it's good that I exercised because it affects my general physical condition"). Or, after positive self-evaluation, where we would use the self-critical "but" it is important to end the sentence. For example: "Today I was perfect, but I must've done more", person can end the sentence before the but part.

To set a realistic, achievable, and attainable goal is the prerequisite for success. Belief in the possibility of achieving a goal set that high is a part of motivation for continuous achievement of success: sometimes- for a lifetime. Without goals set high, and the persistency of working on their realization, our world would be denied different inventions and lasting civilizational values. And the persons who indebted us with them would be denied the experience of mistakes, failures, suffering, pain, tournaments and effort which were repeatedly their motivation for moving forward but also the source of inner contentment which was brought to them by triumph over external challenges, and mostly by triumph over themselves. To work, to try, to strive for excellence and resist the challenges of unsuccessful attempts and mistakes are characteristics of successful and satisfied persons who are aware of their own potentials and limitations. In that sense, messages from adults should encourage the young adults to set high goals, and in the process on working on their fulfillment, to evaluate their own strengths and abilities. Studies on resilient persons confirms that young people who had the authorities that sought more and better of them were attaining greater emotional stability and developed greater self-confidence than those who were satisfied with meeting the average achievements or were praised for minimal effort.

Particularly powerful context for learning healthy self-confidence is the classroom. In addition to numerous ways how an adequate assessment of person's capabilities in pedagogical work can be stimulated: by varying the tasks and challenges that have different complexity, the possibility for a child to choose the pace of his own progress, individualized method teaching, etc., use of humor can be a very useful tool in dealing with children who are prone to perfectionism. Powerful messages that bring perfectionistic behavior to the absurdity can be expressed through humor. In that manner, a slight dosage of easiness is introduced while talking about failures, about the fact that sometimes we are all prone to over self-criticizing and generalization that make it harder for us to stay motivated

while facing the challenges brought to us – by school or ourselves. Specifically, it is possible to create different displays with pictures or caricatures, jokes on the account of high expectations, “all or nothing” way of thinking, overgeneralizing etc., and examples that show that combination of challenges and realistic expectations makes learning be comprehended more as a positive challenge, rather than as an experience to be avoided.

Conclusion

As a conclusion of aspects of perfectionism that were presented here, we consider appropriate to cite the words of Petruska Clarkson, (1992) psychotherapist and clinical psychologist about the naturally present perfectionism in all of us: „The perfection is already inherent in every human being according to his or her capacities or gifts. Every human being is at this moment already being as perfectly himself or herself as is possible “.

References

- Ablard, K.E., Parker, W.D. (1997). Parents' achievement goals and perfectionism in their academically talented children. *Journal of Youth and Adolescence*, 26, 651-667
- Brown, E. J., Heimberg, R.G., Frost, R.O., Makris, G. S., Juster, H. R., Leung, A.W. (1999.), Relationship of perfectionism to affect, expectations, attributions and performance in the classroom, *Journal of Social and Clinical Psychology*, 18 (1): 98-120.
- Callahan, J. (1993). Blueprint for an adolescent suicidal crisis. *Psychiatric Annals*, 23(5), 263-270.
- Flett, G.L., Hewitt, P.L. (2002). *Perfectionism. Theory, Research and Treatment*. Washington DC: APA.
- Frost, R.O., Marten, P., Lahart, C., Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research*, 14(5), 449-468.
- Grabar, M (2005). *Nadarenost i neurotski perfekcionizam kod osnovnoškolaca*. Diplomski rad. Zagreb. Odsjek za psihologiju Filozofskog fakulteta u Zagrebu.
- Hamachek, D. E. (1978.), Psychodynamics of normal and neurotic perfectionism, *Psychology*, 15: 27-33.
- Heller, K.A., Monks, F.J., Sternberg, R.J., Subotnik, R.F. (2000). *International handbook of giftedness and talent; second edition*. Oxford, Elsevier Science Ltd.
- Hewitt, E L., Dyck, D. G. (1986). Perfectionism, stress, and vulnerability to depression. *Cognitive Therapy and Research*, 1(9), 137-142.
- Hewitt, P. L., Flett, G. L. (1991.), Perfectionism in the self and social contexts: Conceptualisation, assessment, and association with psychopathology, *Journal of Personality and Social Psychology*, 60: 456-470.
- Kolić-Vehovec, S., Rončević, B (2003). Perfekcionizam, ispitna anksioznost i akademsko samopouzdanje darovitih gimnazijalaca, *Društvena istraživanja*, Zagreb, 5 (67): 679-702.
- Lask, B., Bryant-Waugh, R. (1992). Early-onset anorexia nervosa and related eating disorders. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 33(1), 281-300
- Lauri Korajlija, A. (2005). *Povezanost perfekcionizma i atribucijskog stila s depresivnošću i anksioznošću*. Magistarski rad. Zagreb: Odsjek za psihologiju Filozofskog fakulteta u Zagrebu.
- Leroux, J. A. (1989). An exceptional success: A case study of a gifted young woman. *Gifted Education International*, 6(1), 28-29.
- Pajares, F., Kranzler, J. (1995.), Self-efficacy beliefs and general mental ability in mathematical problem-solving, *Contemporary Educational Psychology*, 20: 426-443.
- Pyryt, M.C. (2004). Helping Gifted Students Cope with Perfectionism. *Parenting for High Potential*, 10-14

- Rasmussen, S. A., Eisen, J. L. (1992). The epidemiology and clinical features of obsessive compulsive disorder. *Psychiatric Clinics of North America*, 15(4), 743-758.
- Roedell, W. C. (1984). Vulnerabilities of highly gifted children. *Roeper Review*, 6, 127-130.
- Slaney, R.B., Ashby, J.S., Trippi, J. (1995). Perfectionism: Its measurements and career relevance. *Journal of Career Assessment*, 3, 279-297.
- Stoeber, J., Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and Social Psychology Review*, 10, 295-319.

PERFEKCIONIZAM KOD DAROVITIH

Ima li perfekcionizam svoje dobro lice?

Lada Marinković

Visoka škola strukovnih studija za obrazovanje vaspitača, Novi Sad

Apstrakt

Perfekcionizam se u psihologiji najčešće definiše kao crta ličnosti koju odlikuje stremljenje ka dostizanju izuzetno visokih standarda, praćeno naglašenom samokritičnošću i strahom od negativne spoljne evaluacije. Kao multidimenzionalni konstrukt, perfekcionizam ima svoje pozitivne i negativne aspekte. Kao neadaptivan i negativan prepoznaje se kroz zahteve osobe da dostigne nedostižno, a kao rezultat toga osoba razvija neki oblik psihopatologije (depresija, anksioznost, OKP i sl.). Adaptivan i pozitivan, javlja se kao podstrek i motivacija da se napreduje, teži ka ostvarenju visoko postavljenih ciljeva i ideja, te osoba oseća zadovoljstvo tokom tog procesa.

U grupi darovitih, perfekcionizam se neretko sreće upravo kao posledica svesnosti o svojim sopstvenim razvijenim intelektualnim karakteristikama ili iskustvu visokog postignuća u nekoj određenoj oblasti. Saznanje o svojim visokim mogućnostima osobu navodi na dostizanje visokih ciljeva. U tom smislu, perfekcionizam se kod darovitih često pojavljuje kao adaptivan mehanizam, zasnovan na realnim procenama svojih mogućnosti. Zahtevanje od darovitih da ostvare visoke rezultate, da budu bolji i/ili najbolji najčešće deluje motivišuće i donosi radost pri radu i napredovanju, ne demoralizuje i ne deprimira ih.

Cilj ovog rada je da se ukaže na vezu između perfekcionizma i darovitosti i da se obrazlože pozitivni aspekti perfekcionizma. Istovremeno, govoreći o pozitivnom perfekcionizmu biće istaknuti i načini na koje se može delovati na decu i mlade da nauče da postavljaju realna očekivanja od sebe i drugih, te da se ne plaše grešaka, već da ih očekuju, poštuju, istražuju i koriguju. Uloga i značaj odraslih u ovom procesu je nezaobilazna.

Ključne reči: perfekcionizam, adaptivni perfekcionizam, darovitost, strah od greške, stah od neuspeha.

WHAT DOES HUMOR HAVE WITH CREATIVITY?

Lada Marinković

Preschool Teaching Training College, Novi Sad

Abstract

Contemporary trends in the field of work require changes in the process of preparation for work as well as in the field of education. Considering the fact that knowledge and data are maximally available on the Internet, what is nowadays the demand for employers in different fields is creativity, new ideas, different views on the work demands and problem solutions. So, the creativity is what will be increasingly demanded by the workers. The ability to put the well known facts in different contexts, that bring new quality, is that what will determine the choice of job candidates. Creativity as the mental process of creating something new, different, involves the ability for divergent thinking and at the neurological level it is visible as the activity of the right brain hemisphere. Humor is also defined as a mental process in which the right hemisphere dominates, also is based on the ability of divergent thinking and equally represents the ability to find something new and unusual, unexpected in the known constellation of terms.

The aim of the paper is to point out the possibility of recognizing children's interest and expression of humor as a potential giftedness of children. Also, that adults who are working with children have to devote significantly more attention on this kind of behaviour, recognising the indisputable connection between children's play, as the basic activity through which the child learns about the world and others, and laughter and humor as the ability to bring problem situations or forbidden topics into a new relationship, and that the potential for creativity use for its further development.

Using humor children and adults achieve mutual understanding at a level that is not direct, but it has the ability to communicate at a psychological level that involves much more than just sharing ideas and information. Includes the work of both cerebral hemispheres and in one kind of play context allows the production of unusual, new solutions that have the potential for creativity.

Key words: humor, creativity, early development, potential giftedness

Introduction

The scientific field of researching psychological and physiological effects of humor and laughter indicates their complex cognitive functions involving both brain hemispheres. Especially that kind of humor in which we do not laugh to others but with them, helps establishing friendships, builds a team atmosphere and increases creativity. In today's business world, in which the importance of team work is emphasized, encouraging a relaxing and cheerful atmosphere shows excellent results in the increasing of creativity. Research on the development of child's understanding of humor also shows that this ability is often associated with creativity and potential giftedness.

A visible demonstration of the work and activities of the right hemisphere is humor. The ability to put a situation into a new context, to combine different elements to create something new, to look at the wider picture of the problem situation, are all elements of combining in the expression of humor. In addition, humor frees tensions, stress, allows more honest expression of criticism and helps to communicate sensitive or complicated messages, to talk about taboos. For all this undoubtedly requires a certain kind of creativity, plasticity in thinking and good intellectual abilities. Numerous research on creativity has shown that humor has a positive impact on the quantity of ideas and the quality of the creative process in the group / team, resulting in a variety of innovative outcomes. As in the children's world, laughter and humor are inherent in adults, who in a relaxed atmosphere, like a gameplayer, can "play" working and creating.

In this paper, we aim to point out certain connections between humor and creativity in order to recognize children with these potentials through educational process, and be able to stimulate creative potentials of all children.

About Humor and Its Development

In this paper, we consider humor as general cognitive ability to create or notice the incongruity of certain facts, regarding usually expected, and what as a result produces laughter as an expression of the understanding of that observed incongruity. The operationalization of all segments of the humorous situation can lead us into a multitude similar but different terms (laughter, joke, humor, ...). Also, there will be no consideration of the general terms of humor and the sense of humor, as it is well discussed in the professional literature (Martin, 2003; Cann, Collette, 2014; Cann, Etzel, 2008; Ivković, Brdarić, 2014). In contrast to other psychological constructs (eg. intelligence or extraversion) there is no standard concept of the sense of humor upon which the researchers generally agree (Martin, 1998). In this article, therefore, we look at humor as an ability to create unpredictable from predictable, that such situation is understood and cognitively processed, whereby the reaction to such a situation is laughter, joy and play. In that sense, humor is, according to Incongruity Theory of Humor, cognitive ability, capacity, characterized by the fact that when two

or more things combine in a way that is not expected, a reaction of laughter and the experience of a humorous arises. (Keith-Spiegel, 1972).

Martin (2007) speaks of many ways of perceiving humor, and cites several concepts in the definition of humor. A sense of humor as a behavioral habit (the tendency to tell jokes, a person often laughs, (Craik, Lampert, & Nelson, 1996); humor as an attitude (enjoyment in humor; Svebak, 1996); humor as a coping strategy (the tendency to preserve a humorous perspective in dealing with negative events (Lefcourt & Martin, 1986); humor as a cognitive ability (the ability to create, understand and remember the joke (Feingold & Mazzella, 1991).

So far, the sense of humor has been best studied as a cognitive ability to produce humorous content, then as an aesthetic response, as a habit of behavior, a temperamental characteristic, as an attitude, and as a coping strategy (Martin et al., 2003).

In the scientific literature, it can be found that theories of humor can be divided into three most influential groups. These are theories of superiority (the supremacy), the theory of relief (or excitement) and the theory of incongruence, or unexpected outcome (Mulder & Nijholt, 2002). Although not strong scientific theories, they represent a useful framework for the systematization of the explanation of distinctive characteristics of humor. Theories of superiority are based on the feeling of superiority to others manifested through humor. The relief theories relate to the physiological release of tension and are focused on the consideration of the function of humor. Groups of the theory of incongruence are interested in the type of stimulus that provokes humor and are based on the contradictions between the expected and real experience (Wilkins & Eisenbraun, 2009).

Neuro-imaging technology revealed that the left side of the frontal lobes is responsible for laughter (Fried, Wilson, MacDonald, & Behnke, 1998), while the right part of the frontal lobes is responsible for humor processing (Shammi & Stuss, 1999).

It is considered that individuals with a pronounced sense of humor better agree with other people, more easily overcome stressful situations, have better general physical and mental health (Lefcourt, 2001).

Humor has not only positive aspects. Research shows that its aggressive characteristics are visible in the "laughing at the other" versus the one who "laughs with the other" (Martin, 2007).

Possible reasons for the lesser interest of the researchers on the subject of humor are most likely to be the elusive nature of humor and the lack of conformity regarding the basic characteristics of this phenomenon, the lack of a generally accepted definition, and the difficult creation of experimental research conditions (Dixon, 1980).

Development of Humor

From the perspective of developmental psychology there are two ways of children communication with the world around in their earliest days of life. These ways are laughing and crying. A smile, a social smile that appears as a form of interaction with the persons with whom the

child comes in contact, approximately in the third month of life, is a sign of adequate emotional and intellectual development. The next developmental period is developing of language and symbolic games, which make more complex the child's ability to communicate and interact. The ability of making jokes, and the ability to understand them, confirm that there are two different abilities that are gradually evolving. In clarifying their origin, a cognitive theory of understanding incongruity is dominant. The child's ability to perceive and understand, and then creates unexpected situations, logical incongruities, significantly depend on cognitive development, intellectual abilities, abilities for symbolic thinking and other cognitive abilities. In addition to the above mentioned factors, for the development of humor, in the broadest sense, the social environment, social perception of humor is also significant. In relation to this factor, research also points certain cultural differences. Freud's psychoanalytic theory of humor sees the potential for catharsis, the release of tension, especially in terms of taboo themes.

In order to understand the child's development and the appropriate educational strategy it is important to know the stages in the development of a child's understanding of humor. What children consider funny, words that they use and understand, can be used in an educational context. The ability of a child to understand the difference between the familiar norms, whether social or linguistic, and violating them, results in laughter, a reaction that indicates that the child recognizes that difference.

The earliest form of humor can be seen in a child of about six months, but real forms can only be seen at the beginning of primary school. According to McGhee (2002), who in his book "Understanding and Promoting the Development of Children's Humor" describes what children laugh at in various stages of development, says that in order for humor to appear, the child needs to have a certain understanding of the way the world works. Only then a child can notice the incongruities and understand them not only as new information, but rather as a "how-to" situation, or a situation that distorts the familiar patterns and aims to interact with another person through laughter and a new shared emotional experience. McGhee claims that the earliest form of humor is actually the child's reaction to something, not the child's creation.

Humor contributes to children's development by building children's vocabulary, pre-reading and reading skills, spreading children's knowledge, encouraging creative thinking, improving social skills and self-confidence, developing strategies for overcoming stress. The child's sense of humor also reflects his intellectual achievements because humor is a form of intellectual play, playing with ideas, symbols, abstractions.

According to McGhee, humor is a function of the child's level of cognitive development. Especially his ability to deal with symbols (McGhee, 1988). He proposed four stages of humor development, based upon Piagetian theory of development. Humor begins when the capacity for fantasy and make-believe develops (late in the second year). In the first stage (approx. 18 to 24 months) children substitute one object for another. Putting a shoe on the head, if a child knows that shoes are wearing on feet can cause laughter. Second stage (approx. 2 to 3 years) is when

verbal jokes emerges. Though very simple, they represent a higher level of cognitive function, requiring more abstract thought. It is represented by calling the well known objects with different names (mom for dad for example, with correct understanding that "something is wrong. Also, in this stage the object of humor doesn't need to be present. At third stage (3 to 5 years), the child requires more distortion for a humorous effect. The child has increased knowledge of the world and the incongruity that causes humour is visual, not logical. If the picture looks different from what the child expects or that with which he is familiar, there is humour. Until the age of 6 or 7 years, the sense of humour will resemble the humour of adults. This stage is characterised by the child's ability to understand the double meanings that words and sentences can have. A sense of humour does not operate within a narrowly specified range, but increases and expands to appreciate a broader field of types of humour (McGhee, 1979).

How does Humor Support Creativity?

One of the ways is emotional distancing from the problem. Most people can think creatively when not expressed and seriously focused on the task. Also, humor fosters creativity by offering the skill to find something meaningful in something that is incomprehensible, difficult to understand. Finding meaningful links between seemingly unconnected ideas or concepts is also a matter of creativity, and surprising crafts are often the essence of humor.

By using the humor, children and adults achieve mutual understanding at a level that is not direct, but has some kind of psychological level that involves much more than just sharing ideas and information. Includes the work of both cerebral hemispheres and in a play context allows the production of unusual, new solutions that makes the potential for creativity.

About Creativity

As in the case of humor, also it is the case of creativity, there is no unique definition. But most researchers in this area agree that creativity is a process of producing something that is original and worthwhile (Sternberg, 1996., in Arar, Racki, 2003). Creativity can not be reduced to one characteristic or general ability. It is the product of several factors and above all the characteristics of personality, cognitive abilities and social environment (Amabile 1983). It includes flexibility, originality and sensitivity for ideas coming out of the "out-of-the-box" thinking, where the product or activity is not only original, but also appropriate to the problem being solved (Arar, Racki 2003). In recent times, some marks creativity as one of the most important economic resources (Kaufman and Beghetto, 2009 in jubota ...)

The basis of creativity is the ability to make non-obvious connections between seemingly unrelated things (Koestler, 1964). This is also believed to be the basis of humor or more specifically wittiness (Oquin, Derks, 1999). Creative act depends on discovering analogies between two or more ideas

previously thought unrelated. In accordance with the Associative Theory of Creativity, creativity is “the forming of associative elements into new combinations which either meet specified requirements or are in some way useful (Mednick, 1962).

Divergent Thinking and Creativity

According to Guilford and other authors, divergent thinking is at the heart of creativity, but they are not synonymous (Runco, 2007). Divergent thinking is characterized by finding more solutions to a problem and it is undeniable to encourage the creation of diverse responses, but only by itself, it does not have to make a creative solution. All inventions and innovations are creative, but not all creations are innovative or inventive. All innovations start from inventions, but not all inventions become innovations (Kudrowitz, 2006).

The assessment of creativity in the terms of a scientifically operationalized concepts is not an easy task, either because of the lack of a basic definition, and because of the multi-dimensionality of the notion itself and the interdependence of all three previously listed factors that are the core of creativity and its potentials. Csikszentmihalyi (1990) stated that highly successful and creative people are able to show at the same time the opposite characteristics: they can be very disciplined and playful, feminine and masculine, realistic but also prone to fantasy.

Some studies on correlation between creativity and school success show that such a connection depends on the type of school subject, the content of the course, but also on the characteristics of the teachers and the teaching strategies he/she uses. Humor increasingly appears as a high-ranking feature that contributes to school success, motivation to learn, and to a certain extent encouraging students to develop their own creativity.

About the Relationship of Humor and Creativity

Two theories, the one that deals with the explanation of humor and the other that deals with creativity, seem to overlap to a great extent. These are Associative Theory of Creativity and Incongruity Theory of Humor. What makes a joke funny is the amount that the punch line violates the recipient’s expectations while assuming the recipient is still able to make sense of the information.

There have been several researchers and philosophers that have theorized connections between humor and creativity (Kudrowitz, 2006). There have also been several experimental studies that have specifically dealt with correlating humor and creativity (Smith, 1965) and most have found moderately positive correlations. Many studies attempt to correlate general humor with general creativity; however, “not every creative solution is humorous, and many instances of humor are far from creative” (Babad, 1974).

Humor and Creativity in Education

Although the term education carries the connotation of something very serious and important, it does not necessarily mean that it must be deprived of joy, jokes and satisfaction. Namely, everyone knows how much attention children can bring to learning through laughter and play. A funny lesson holds their attention to the material being taught and improves the chances they will learn. An appropriate dose of humor that is responsive to children's capacities to understand it, involves pleasant emotions in the learning process, which can additionally positively motivate students to memorize the content being taught. Also, encouraging or accepting children's spontaneous jokes at the expense of the material or the situation in which they learn, helps not only the memory, but also the relationship that is created between teacher-student or student-student.

According to the findings that humor does not have a purely genetic basis (Martin, 1988) and evidences that humor can be learned (Carson et al., 1986), and that it represents a predisposing that can be developed, the educational system, in addition to the family system, can have a large stake in encouraging the development of this ability. Through play and verbal interaction, adults can foster understanding and creating humor (Honig, 1988). Humor as a teaching strategy is an effective mean of teaching and can be used as helpful for giving feedbacks to students. Although it has only recently been discovered (in educational context), the use of this strategy keeps pace with the contemporary needs and expectations of students who grew up with moving images, rapidly replacing visual and audio content offered by the Internet. Teachers therefore have to find ways not only to gain, but also maintain the attention of their students, but also to make teaching content acceptable for them. Keeping the tendency to teach students to be creative and active in their own learning, the teachers should be creative as well. Humor is shown to be a good strategy in relation to both requirements.

How to Encourage Humor and How to Develop Creativity through Humor?

Humor in educational settings serves a variety of positive functions beyond simply making people laugh. Above all it creates group cohesion so the pupils respond more positively to each other when humor is present. Some researchers also find that humor helps individuals cope with stress.

There are many different types of humor that have been identified as useful in the classroom. It can be humor related to class material, funny stories as example of content, humorous comments, self-disparaging humor, unplanned spontaneous, unintentional humor and visual illustrations like cartoons, comics, or video clips.

Humor positively affects levels of attention and interest. It's a way to keep students engaged and involved with the content of their lessons.

Researchers agree that children who laugh in the classroom develop strong communication and critical thinking skills, become more creative, and easily cope with stress. Laughing together means making team atmosphere and strong bond between pupils and teacher. Humor is a natural icebreaker and reduces classroom conflict, tensions, and increases pupils' attention and participation. Some of the good examples for encouraging creativity are the use of funny ways for greeting each other (daily or weekly), using funny quotes for introducing content of lessons, encouraging students to find or share jokes related to the content, or to create their own jokes, using funny literature, playing with words and so on.

But not all the use of humor is positive. If humor is used divisively or to disparage others, it weakens group cohesion. Humor can have negative impacts when it is used as a means of control. It is highly inappropriate for teacher to target students by making fun of their ignorance or beliefs. And some kinds of humor are never appropriate, such humor that manipulates, denigrates, ridicules, or mocks others and offensive humor that is racially or sexually based. Using too much humor, negative and aggressive humor, and humor disparaging to students damages credibility. Teachers should utilize humor that laughs with students rather than at them (Banas et. al., 2011).

As Charlie Chaplin said: "A day without laughter is a day wasted".

References

- Amabile, T. M. (1983). *The social psychology of creativity*. New York: Springer - Verlag.
- Arar, Lj., Rački, Ž. (2003). Priroda kreativnosti. *Psihologijske teme*. No 12.
- Babad, E.Y. (1974). Multi-method approach to assessment of humor - critical look at humor tests. *Journal of Personality*, 42(4): p. 618-631.
- Banas, J. A., Dunbar, N., Rodriguez, D., & Liu, S. (2011). A review of humor in education settings: Four decades of research. *Communication Education*, 60 (1), 115-144.
- Bilge, F., & Saltuk, S. (2007.). Humor Styles, Subjective Well-Being, Trait Anger and Anxiety among University Students in Turkey. *World Applied Science Journal*, 2(5), 464-469.
- Cann, A., & Collette, C. (2014). Sense of humor, stable affect, and psychological well-being. *Europe's Journal of Psychology*, 10(3), 464-479.
- Cann, A., & Etzel, K. (2008). Remembering and anticipating stressors: Positive personality mediates the relationship with sense of humor. *Humor: International Journal of Humor Research*, 21(2), 157-178.
- Carson, D. K. et al. (1986). Temperament and communicative competence as predictors of young children's humor. *Merrill-Palmer Quarterly*, Vol. 32, No. 4, pp. 415-426.
- Craik, K. H., Lampert, M. D., & Nelson, A. J. (1996). Sense of humor and styles of everyday humorous conduct. *Humor: International Journal of Humor Research*, 9, 273-302.
- Csikszentmihalyi, M. (1990). The domain of creativity. (U M.A. Runco i R.S. Albert(Ur.) *Theories of creativity* (190-212). Newbury Park, CA: Sage
- Dixon N. (1980). Humor: a cognitive alternative to stress? In I. Sarason & C. Spielberger (Eds.), *Stress and Anxiety*, Vol. 7, Washington, D.C.: Hemisphere.
- Feingold, A., & Mazzella, R. (1991). Psychometric intelligence and verbal humor ability. *Personality and Individual Differences*, 12, 427-435.
- Fried, I., Wilson, C. L., MacDonald, K. A., & Behnke, E. J. (1998). Electric current stimulates laughter. *Nature*, 391, 650.
- Honig, A. S. (1988). Research in review. Humor development in young children. *Young Children*, Vol. 43, No. 4, pp. 60-73.

- Ivković, S. Brdarić, D. (2014). Samoprocena i procena od strane drugih u kontekstu smisla za humor - Draga, da li ćeš verovati svojim očima ili meni? Saopštenje sa štampanim rezimeom. Naučno-stručni skup: Sabor psihologa na Zlatiboru.
- Keith-Spiegel, P. (1972), *Early Conceptions of Humor: Varieties and Issues*, in *The Psychology of Humor*, J.H. Goldstein and P.E. McGhee, Editors, Academic Press: New York. p. 4-39.
- Koestler, A., (1964). *The act of creation*. New York,: Macmillan. 751 p.
- Kudrowitz, B. M. (2006). HaHa and Aha! Creativity, Idea generation, Improvisational Humor, and Product Design Thesis (Ph. D.)--Massachusetts Institute of Technology, PDF version of thesis; **URI:** <http://hdl.handle.net/1721.1/61610> (2.07.2018).
- Lefcourt, H. M. (2001). *Humor: The psychology of living buoyantly*. New York: Kluwer Academic.
- Lefcourt, H. M., & Martin, R. A. (1986). *Humor and life stress: Antidote to adversity*. New York, NY: Springer-Verlag.
- Ljubotina, D., Juničić, N., Vlahović-Štetić, V. (2015). Struktura i prediktori samoprocjene kreativnosti kod srednjoškolaca. *Psihologijske teme*, 24, (3), 369-399
- Martin, R. A. (1988). Humor and the mastery of living: using humor to cope with the daily stresses of growing up. *Journal of Children in Contemporary Society*, Vol. 20, No. 1-2, pp. 135-54.
- Martin, R. A. (1998). *Approaches to the sense of humor: a historical review*. In: Ruch, Willibald (ed.). *The sense of humor: explorations of a personality characteristic*. *Humor Research: 3*. Berlin/New York, NY: Mouton de Gruyter
- Martin, R. A. (2003). Sense of humor. In S. J. Lopez & C. R. Snyder (Eds.), *Positive psychological assessment: A handbook of models and measures* (pp. 313-326). Washington, DC: American Psychological Association.
- Martin, R. A. (2007). *The Psychology of Humor: An Integrative Approach*. Amsterdam: Elsevier Academic Press.
- McGhee, P. (2002). *Understanding and Promoting the Development of Children's Humor*. New York: Kendall/Hunt.
- McGhee, P. E. (1979). *Humor: Its origin and development*. San Francisco, CA: Freeman.
- McGhee, P. E. (1988). Introduction: recent developments in humor research. *Journal of Children in a Contemporary Society*, Vol. 20, No. 1, pp. 1-12.
- Mednick, S.A. (1962). The associative basis of the creative process. *Psychol Rev.* 69: p. 220-32.
- Mulder, M. P., & Nijholt, A. (2002). *Humour research: State of the art*. Enschede, Netherlands: University of Twente.
- O'Quin, K. Derks, P. (1999). *Humor*, in *Encyclopedia of Creativity*, S.R. Pritzker and M.A. Runco, Editors.
- Runco, M. A. (2007). *Creativity: theories and themes: research, development, and practice*. San Diego, CA: Elsevier Academic Press.
- Shammi, P., & Stuss, D. T. (1999). Humour appreciation: A role of the right frontal lobe. *Brain*, 122, 657-666.
- Smith, E.E., White, H. L. (1965). *Wit, creativity, and sarcasm*. *Journal of Applied Psychology*, 1965. 49(2): p. 131-134.
- Svebak, S. (1996). The development of the Sense of Humor Questionnaire: From SHQ to SHQ-6. *Humor: International Journal of Humor Research*, 9(3-4), 341-361
- Wilkins, J., & Eisenbraun, A. J. (2009). Humor theories and physiological benefits of laughter. *Holistic Nursing Practice*, 23(6), 349-54.

ŠTA TO HUMOR IMA SA KREATIVNOŠĆU?

Lada Marinković

Visoka škola strukovnih studija za obrazovanje vaspitača, Novi Sad

Apstrakt

Savremena kretanja na polju rada, zahtevaju promene i na planu pripreme za rad-obrazovanja. S obzirom na činjenicu da su znanja i podaci maksimalno dostupni putem Interneta, ono što danas postaje zahtev poslodavaca u različitim oblastima je kreativnost, nove ideje, drugačiji pogledi na rešenja postavljenih problema. Dakle, kreativnost je ono što će se sve više tražiti od radnika. Sposobnost da se činjenice postave u različite kontekste koje donose novi kvalitet je ono što će u mnogim situacijama opredeliti izbor kandidata za posao. Kreativnost kao mentalni proces stvaranja nečeg novog, drugačijeg, uključuje sposobnost za divergentno mišljenje a na neurološkom nivou vidljiv je kao aktivnost desne moždane hemisfere. Humor se takođe definiše kao mentalni proces u kojem je dominantna desna hemisfera, takođe počiva na sposobnosti divergentnog mišljenja i jednako predstavlja sposobnost da se u poznatoj konstelaciji pojmova pronade nešto novo i neobično, neočekivano i nesvakidašnje.

Cilj ovog rada je da ukaže na mogućnost da se posmatranjem dečjih interesovanja i izražavanja humora prepozna potencijalno darovito dete i njegov kreativni potencijal. Takođe, da odrasli koji sa decom rade, ovoj temi posvete značajno veću pažnju, s obzirom na neospornu vezu dečje igre kao osnovne aktivnosti kroz koju dete saznaje svet, sebe i druge i smeja i humora kao sposobnosti da se pojmovi, problemske situacije ili zabranjene teme dovedu u novu vezu i moguće takav potencijal iskoristi i za razvoj kreativnosti.

Upotrebom humora deca i odrasli postižu bolje razumevanje n nivou koji nije direktan i eksplicitan, već je komunikacija na jednom psihološkom nivou, koji uključuje više od same razmene ideja i informacija. Uključuje aktivnost obe moždane hemisfere, empatiju kao i jednu vrstu igrolike aktivnosti u kontekstu koji dozvoljava produkciju neobičnih, novih rešenja i viđenja situacija a koje imaju potencijal za kreativnost.

Ključne reči: humor, kreativnost, rani razvoj, potencijalna darovitost

UDC 371-056.45(497.11)
Original scientific paper

IDENTIFICATION OF EDUCATIONAL NEEDS OF GIFTED STUDENTS FROM SMALLER COMMUNITIES

Mirjana Nikolić¹, Željko Nikolić² & Veronika Katrina-Mitrović³

*¹Preschool Teacher Training and Business Informatics College of Applied Studies –
Sirmium, Sremska Mitrovica, Serbia*

²Primary School "Kadinjača", Loznica, Serbia

³General Hospital, Loznica

Abstract

By analyzing students' achievements in republic competitions in mathematics and informatics in the Republic of Serbia in the last three years, and in physics in previous years, it has been found that the greatest number of awards have been won by students from large cities (university centres). This is proportionate to the number of inhabitants, but it also raises the question of the quality of additional support to students from smaller communities. Therefore, the aim of this research was to identify the educational needs of gifted students at the local level. The research was conducted in a smaller city environment, a semi-structured interview with six students of the 6th, 7th, and 8th grade who achieved placement on the republic's competition from two of the three (or all three) areas, an individual interview and a focus group interview with the parents of the students and three subject teachers, were applied. In order to achieve the research aim the following tasks were set: 1) to determine the contribution of school, parents and other individuals in working with these students; 2) to identify possible difficulties encountered by teachers and parents in the process of providing support to gifted students; 3) to identify preferred forms of additional support. The results of the research indicated that, apart from the contribution of some subject teachers, great contribution is given by parents/teachers of related subjects, mentors in the place and outside the place of residence of students and peer mentors. Teachers emphasize that poor motivation (due to lack of financial stimulation), but also insufficient knowledge of some teachers for preparing students for high levels of competitions represent serious difficulties in providing additional support to students. Parents face the problem of finding an adequate mentor, as well as significant financial investments. Additional support at the local level should be based on the identification of the gifted, financial stimulation of teachers/mentors as well as giftedness experts (psychologists) who would be associates of the Regional Centre for Talents, but also requires significant financial resources from the city budget.

Keywords: gifted students, additional support, Regional Centre for Talents, finances

Introduction

Giftedness is not an unambiguous phenomenon. In the literature in this field, we find a number of theories of giftedness and the gifted - from those that equate giftedness with high general intelligence (for example, Terman, according to Altaras, 2006), to modern theories that see giftedness as a multidimensional construct, composed of dynamic interaction of domains of specific abilities, personality traits, environment factors, etc. (Dai & Renzulli, 2008; Renzulli, 2012). There are numerous attempts to define giftedness that relate to specific domains (mathematics, language, art, etc.) and indicators that would help identify children (later students) who demonstrate high abilities in a given domain.

The needs of modern society are increasingly focused on discovering and continuing support for students who show IT giftedness (Nikolić, Nikolić & Subotic, 2018). However, IT giftedness is not easy to identify in the adulthood. Therefore, some scientists have tried to identify a set of abilities that imply success in this area. Some have found that programming skills are correlated with high academic achievement in mathematics (Coates & Stephens, 1990; Overton, Harms, Taylor & Zickar, 1997; Zickar, Overton, Taylor, & Harms, 1999; Dudgale, 1994), while others have claimed that the programming skills are related to mathematical abilities, but in the applied sense (Tseitin, 1979), and that constructive engineering skills and aesthetic views are as important for IT giftedness as logical and mathematical reasoning (Erhsov, 1972). In addition, there is a belief that programmers should also possess skills such as: verbal and non-verbal intelligence at a high level, cognitive flexibility, critical thinking, advanced abilities for abstraction and interpersonal relationships, readiness to update knowledge, good social skills, i.e. personality traits (Babaeva and Voiskounsky, 2002).

The understanding of mathematical giftedness as a complex phenomenon (independent of other areas such as IT giftedness, for example) involves several dimensions: specific mathematical abilities - the ability to think in mathematical symbols, the ability to quickly generalize mathematical relations and operations, the flexibility of mental processes during exercising mathematical activities, the pursuit of simplicity, clarity and logic in problem solving, reversibility of mental operations in the context of mathematical reasoning, affective-motivation factors, positive attitudes towards mathematics and a positive self-concept in the sense of assessing their own mathematical abilities (Wiczerkowski et al., 2000, according to Štula, 2006). In the relevant literature we have not found any studies that would explain the giftedness in the field of physics. However, students who demonstrate exceptional abilities and achievements in the field of mathematics are also quite often successful in physics, especially in the period of elementary education. Experts explain this by the fact that physics content can be operationalized due to mathematical apparatus, along with understanding of some relationships in nature that enable understanding of tasks.

Educational support for students who are gifted in the field of mathematics, physics and informatics (programming) is based on known strate-

gies that imply acceleration, enrichment and separation (Grandić & Letić, 2009). Gifted students (and their families) who show giftedness in these areas are increasingly determined to continue their education in specialized high schools (Mathematics High School in Belgrade, High School "Jovan Jovanović Zmaj" in Novi Sad, High School "Svetozar Marković" in Niš and Gimnasium in Kragujevac, 1th) from the seventh grade, in order to get the opportunity to work according to enriched programs with the support of professional staff. By analyzing the achievements of the students of the 6th, the 7th and the 8th grade at the republic competitions in mathematics and informatics in the Republic of Serbia in the last three years, (and in physics in the previous years), it was found that students from large cities (university centres), and especially students attending specialized high schools win a significantly higher number of awards than students from other cities (Table 1).

Table 1. Analysis of the results of the students of the VI, VII and VIII grade at the republic competitions in mathematics and informatics in the last three years

	Fields											
	Mathematics						Informatics					
	% awarded from University Centres			% awarded from other cities			% awarded from University Centres			% awarded from other cities		
	VI	VII	VIII	VI	VII	VIII	VI	VII	VIII	VI	VII	VIII
2017/18.	60	81	72	40	19	28	58	77	68	42	23	32
2016/17.	72	80	77	28	20	23	57	65	68	43	35	32
2015/16.	53	71	58	47	29	32	56	60	66	44	40	34

The result in Table 1 show the tendency that in the sixth grade the ratio of IT awards in all three years and in mathematics (in the school year 2015/2016) is mildly in favor of students from university centres. In the 7th grade, the number of awarded students from university centres is significantly higher (almost 80% of the awarded), both in mathematics and informatics. In the 8th grade, about 70% of the awarded were from university centres. The data clearly indicate that since the 7th grade, a significantly higher number of students are studying in large university centres and/or attending specialized gymnasiums have won one of the first three awards at the republic competitions in mathematics and informatics. These data can, in only one aspect, be explained by a larger number of residents in large university centres, and hence students who potentially participate in the competitions. It seems there are other reasons, too. As it has been already mentioned, an increasing number of students from cities across Serbia are opting for specialized Gymnasiums from the 7th grade. Also, students who attend these Gymnasiums, or live in large cities, have the opportunity to work with experts, who become their mentors. It has long been known that mentoring is an optimal way of

providing additional support to pupils who show outstanding giftedness in a particular field (Alibabić, 2004). Students who live and study in smaller environments, and especially those who demonstrate exceptional abilities and results in the field of mathematics and informatics up to the 5th and 6th grade, can face the problem of adequate additional support in their further education. However, some students manage to maintain outstanding achievements by the end of elementary education, even though they live in smaller environments. On the other hand, there is a risk that many other students, of similar or same abilities, fail to achieve the same results because they lack additional support, or professionally qualified staff to work with them. Therefore, the aim of this research was to identify the educational needs of gifted students from a smaller urban environment and to create a model of additional support at the local level. In order to achieve the research aim, the following tasks were set: 1) to determine the contribution of school, parents and other individuals in working with exceptionally gifted students; 2) to identify possible difficulties encountered by teachers and parents in the process of providing support to these students; 3) to identify preferred forms of additional support at the local level from the perspective of teachers and parents.

Method

Sample Research

The survey was carried out in a smaller urban environment, on a sample that included six students (five boys and one girl) of the 6th, 7th and 8th grade who entered republic competition from at least two of the three areas (mathematics, physics, informatics) in the current school year (2017/18). The sample also includes parents of children (both parents), and one subject teacher from each area, who worked with students.

Table 2. Description of sample of students by gender, grade and areas:

Students' initials and gender	Grade	Mathematics	Physics	Informatics
N.M. - male	VI	YES	YES	-
J.N. - male	VI	YES	YES	YES
B.P. - male	VII	YES	YES	YES
T.S. - male	VII	YES	YES	-
S.N. - male	VIII	YES	YES	-
E.T. - female	VIII	YES	YES	-

As it can be seen in Table 2, all six students have entered the republic's competition in mathematics and physics, and two students have also entered the republican IT competition.

Table 3. Description of the sample of parents: education and occupation

Students' initials	The level of mother's education	Mother's occupation	The level of father's education	Father's occupation
N.M.	IV	Tourism technician	VII	Teacher of mathematics and physics
J.N.	VIII	Professor of psychology	VII	Teacher of technique and informatics
B.P.	VII	Teacher of art	VII	Telecommunications engineer
T.S.	VII	German teacher	VII	Doctor
S.N.	IV	Interpreter	IV	Programmer
E.T.	VII	Lawyer	VII	P.E. teacher

Table 3 indicates that five fathers have higher education; two are teachers of mathematics, physics, technique and informatics (relevant fields of research). Four mothers have higher education (one with a doctorate, professor in higher education).

Table 4. Description of the sample of teachers: length of service, area and previous results

Teachers' initials	Length of service	Area	Previous results
V.Đ.	25	Physics	More republic awards of students, which ranked the teacher third in the list of all physics teachers in the Republic of Serbia
V.P.	30	Mathematics	One student - III award at the republic competition, a number of students who entered republic competition
Ž.N.	15	Informatics	One pupil (now a student): several first republic awards and 3rd award at the Serbian Informatics Olympiad ; Second pupil (now VI grade): II Republic Prize in the V grade, I Republic and II prize at the Serbian IT Olympiad in the VI grade; More students who entered district competition

Procedure

The research was carried out in a city school that provided adequate conditions for conducting the research. In the first phase, an individual interview was conducted with each student, then with each pair of parents, and each of the teachers. Interviews with students and teachers lasted 30 minutes, and interviews with parents lasted about 45 minutes. In the second stage, the focus group was formed by parents (one from the parental couple and three teachers). The research/interview was conducted by two psychologists, and with the consent of the participants an audio recording was made. Data on results achieved by students on the Republic competition in the mentioned areas were also collected.

Instruments

For the needs of the first phase of the research, a semi-structured interview for students, parents and teachers was created.

Questions for students:

- 1) Can you tell who you are studying with/preparing for competitions?
- 2) Can you evaluate how much each of the individuals with whom you study/prepare contributed to your success guided by the following scale: 1-minimal contribution; 2-significant contribution; 3-extraordinary contribution.

Questions for teachers:

- 1) How do you organize additional support for extremely gifted students within your area?
- 2) Do you encounter some difficulties in working with these students? Or some other difficulties?

Questions for Parents:

- 1) Are you involved in preparing your children for the highest levels of competition? In what way?
- 2) Do you encounter some difficulties in supporting children in their work? Can you specify what the difficulties are?

Questions for a focus group interview for teachers and parents

- 1) Do you have any suggestions on how to organize additional work/support for students who demonstrate outstanding abilities in mathematics, physics and informatics within the school?
- 2) Do you have proposals for organizing additional support at the city level? Who should work with students, in what way, under what conditions etc.?

Data Analysis

A transcript of conducted interviews (individual and in focus groups) was made, and then the answers were classified and sorted into categories.

Results

The contribution of school, parents and other individuals to working with gifted students

In response to the first set task of the research: to determine the contribution of school, parents and other individuals in the work with students who have entered two or three republic competitions in the field of mathematics, physics and informatics an interview with students, teachers and parents was conducted. Firstly, an analysis of the responses made by students will be presented (Table 5, Table 6 and Table 7).

Table 5. Students' evaluation of the contribution of school/teachers, parents and other individuals in the field of mathematics

Students' initials	Subject teacher	Parent / teacher (or a close family member / teacher)	Mentor/ private teacher in the place of residence	Mentor / private teacher outside the place of residence	Award at the Republic competition
N.M.	1	3	2	-	-
J.N.	2	3	-	3	III award
B.P.	1	-	-	3	III award
T.S.	1	-	2	-	-
S.N.	1	-	2	-	-
E.T.	1	3	-	-	-

In the field of mathematics, as it can be seen in Table 5, additional support for students is mainly provided by parents or a close family member (grandfather, retired teacher of mathematics and physics). Three students (50%) emphasize the contribution of parents and close family members as significant. The teacher's contribution is generally assessed as minimal, except for one teacher whose contribution is assessed as significant. The mentor's support outside the place of residence in private work is also emphasized (two students - 33.33%). If we look at the results of the students at the republic's competition, it can be noticed that the two students with whom mentors worked outside the place of residence (university professor of mathematics and mathematics professor in higher education) received awards. One of the two award-winning students had, as he/she estimated it significant support of the subject teacher as well as the parent (teacher of technique and informatics).

Table 6. Students' evaluation of the contribution of school/teachers, parents and other individuals in the field of physics

Students' initials	Subject teacher	Parent / teacher (or a close family member / teacher)	A teacher who additionally works with all the students in the city	Award at the Republic competition
N.M.	3	3	3 – and a subject teacher	II award
J.N.	1	3	3	I award
B.P.	3	-	3 – and a subject teacher	-
T.S.	1	-	3	III award
S.N.	1	-	3	III award
E.T.	1	3	-	III award

As far as the physics field in Table 6 is concerned, it is clearly noted that the contribution of one subject teacher, who works with all the students in the city, is particularly significant. In addition, three students also had additional support from parents (teacher of mathematics and physics, and teacher of technique and informatics) and grandfather – retired teacher of mathematics and physics. Out of six students, five won one of the three republic awards.

Table 7. Students' evaluation of the contribution of school/teachers, parents and other individuals in the field of informatics

Students' initials	Subject Teacher	Parent / teacher (or a close family member / teacher)	A teacher who additionally works with all the students in the city	Mentor - student of the faculty (former competitor)	Award at the Republic competition
J.N.	3	3	3 – subject teacher and a parent	3 (preparations for the Serbian Informatics Olympiad, where the student won the II prize)	I and II prize at Serbian Informatics Olympiad
B.P.	-	-	2	-	-

In the field of informatics, one teacher worked with both students on the territory of the city. The teacher of technique and informatics worked with one student from the role of a parent, and a student/former compe-

titor who won the republic awards and awards at the Serbian Informatics Olympiad was involved in the work. The student who had the support of the parents/teachers and the student won the I Republic Prize and the II prize at the Serbian Informatics Olympic, while the other student entered the republic competition.

The results of interviews with teachers in order to define how the teachers involved in the research provide additional support and work with extremely gifted pupils in the field they teach, are presented in the next part.

Table 8. Self-assessment of teacher's contribution

Teachers involved in research	Subject	Self-assessment of personal contribution to working with gifted students
V.Đ.	Physics	<p>During regular classes - enrichment of the curriculum: During additional classes - working with all students in the city's territory who are interested in physics Mentorship - with students who show great interest and abilities for physics All activities are carried out at school during the school year in accordance with the schedule of additional classes and intensified two months prior to the competition Working with a group of students especially interested in physics within the Regional Centre for Talents All activities outside regular assignments are carried out voluntarily</p>
V.P.	Mathematics	<p>During regular classes - enrichment of the curriculum During additional classes - working with students at school who are interested in mathematics Additional classes are organized according to schedule and teacher's assignments, and mentoring is done at school, via e-mail, intensively, a month before the competition, voluntarily Mentorship - with students who show great interest and abilities for mathematics</p>
Ž.N.	Informatics	<p>During regular classes - enrichment of the curriculum During additional classes - working with all students in the city's territory who are interested in informatics Additional classes are organized twice more often than planned by teacher's assignments, mentoring activities are continuous throughout the year Mentorship - with students who demonstrate extraordinary interest and ability for informatics at school, via e-mail, active participation in the bubble bee platform for teachers and students. All activities outside regular assignments are carried out voluntarily</p>

It can be concluded that two teachers (physics and informatics) organized additional classes for students from all schools in the city (and not only students of the school where teachers work). Teachers organized this form of additional support on their own initiative, and the number of students (not only of students with exceptional abilities and results in these fields), who are interested in these areas is significant. All three teachers work more with students, especially with students with outstanding abilities, preparing them for high levels of competition as mentors, regardless of the fact that these activities are not evaluated additionally.

The results of interviews with parents focused on looking for the answer to the question of whether parents are involved in preparing children for the highest levels of competition, and in what way, are shown in Table 9.

Table 9. Self-assessment of parental contribution

Students' initials	Father's occupation	Additional support form	Mother's occupation	Additional support form
N.M.	Teacher of mathematics and physics	Direct work with a student in the field of mathematics and physics	Clerk	Emotional support; contact with mentor/private teacher
J.N.	Teacher of technique and informatics	Direct work with a student in the field of mathematics, physics and informatics providing contact with a student/past competitor and a student who has a mentor role	Professor of psychology	Emotional support, arranging contact with mentor outside the place of residence/mathematics teacher in higher education
B.P.	Telecommunications engineer	Contact with a mentor-university professor outside the place of residence	Teacher of art	Emotional support
T.S.	Doctor	Contact with a mentor/private teacher	German teacher	Emotional support

S.N.	Electrical technician	Direct work with a student in the field of informatics; Contact with a mentor/private teacher	Programmer	Emotional support, work in the field of mathematics at lower levels of competition
E.T.	PE teacher	Emotional support	Lawyer	Emotional support; providing conditions for working with a grandfather – retired teacher of mathematics and physics

It can be concluded that three fathers worked directly with children - one only in the field of informatics, one in the field of mathematics and physics, and one in all three fields. Fathers' engagement is also aimed at providing mentors/private teachers, while mothers are mainly focused on providing emotional support. All parents are, therefore, directly or indirectly involved in providing additional support to children.

Difficulties in providing additional support to students from the perspective of teachers and parents

Excerpts from interviews with teachers:

Physics teacher: *Students of high interest and abilities come to additional classes that are organized for all children from the territory of the municipality. However, in additional classes attention cannot be paid only to pupils of exceptional abilities, so they need mentorship. The concept used to function in the Centre for Talents, but voluntarily (another colleague was working, an outstanding teacher). Considering that in the Centre for Talents, according to the regular concept there is a mentor work (also voluntarily), a number of students opt for physics (some of them choose this field not because they are really interested, but because there are no available mentors in other fields), so it is difficult to work with so many students.*

Teacher of Mathematics: *Continuous work is required to prepare students with outstanding abilities for high levels of competition, which exceeds the number of additional classes. Also, additional classes are provided for students with high abilities and interests, and mentors should work with students with outstanding abilities. This requires extraordinary preparation of teachers/mentors, following contemporary trends, demands that are becoming more complex, high motivation, dedication etc. This kind of work is not evaluated in any way, so the motivation to work with the students (but above all on their own improvement) is becoming lower.*

Informatics teacher: *The basic problem is the lack of competence of the teachers themselves for the field of competitive programming. The situation is similar in other areas; the problem is to find a mentor/teacher whose*

knowledge includes the contents of the highest levels of competition (Serbian Informatics Olympiad, Junior Balkan Olympiad ...). Lately, students of engineering faculties prove to have this knowledge, but also former competitors, and current competitors (now high school students), who are mostly students of the Mathematical Gymnasium. A small number of teachers are also motivated to study this field, even though a group of experts organized free trainings for teachers and students (in June), and worked on designing the bubble bee platform in order to systematize tasks from competitive programming.

Based on interviews with parents, the difficulties faced by all parents involved in the research are identified:

- The problem of finding mentors in the field of mathematics and informatics who would work with students at the highest levels of competition;
- Financial investment in additional private classes with mentors/teachers who can work with children. Sometimes they are mentors outside the place of residence, so investments are not only financial but also organizational.
- Insufficient knowledge about the developmental characteristics of children, occasional problems in work and further advancement, the ways of supporting children, not putting pressure on them.

The opinions of teachers and parents about preferable forms of additional support

Teachers and parents agree that a strategy that has been practiced by a physics teacher for many years and, recently by teacher of informatics, additional teaching for all children from schools from the city territory is an example of good practice, especially for children who show increased abilities and interests in these areas. However, children with outstanding abilities also require mentorship. Both parents and teachers pointed out that there is a Municipal Regional Centre for Talents (but because of the problem of financing it does not work). It is one of 14 Centers formed at the national level as significant resources to support work with gifted children and pupils. Many teachers are insufficiently motivated to get involved in the work of the Centre as associates, because there is no financial compensation for their work, and other teachers (such as a physics teacher) work with a large number of students and they do not have enough time or motivation. Teachers suggest identifying mentors at the city level (at least two mentors in the field) who would work as assistants to the talents centre and prepare children for the highest levels of competition. In the field of informatics, it is necessary to include peer mentors/present or former competitors in the work of the Centre (either directly or at least through the support of IT resources), while in the field of mathematics, other mentors are engaged, and this is, preferably, former competitors in the mathematics fields that are trained to prepare students for the highest levels of competition. Parents point out that it is important that mentors/associates of the Centre for Talents are adequately paid for their work. All participants in the interview are of the opinion that the city

should financially support this concept. Teachers think that psychologists should also be involved as associates for working with extremely gifted children/students. They also see their role through the support and counseling of gifted students, then their parents, as well as educating teachers themselves in the field of work and work with gifted students. The need for psychological support is also expressed by parents, because they are often in a dilemma, to what limits they should encourage their children to work and progress, without it being a pressure for them.

Discussion

The conducted research confirmed the statement that it is necessary to bring together numerous resources for the development of the potential of a gifted child: parents, teachers, psychologists, professionals for working with the gifted, subject professionals as well as gifted peers, and educate parents, teachers, other experts on the needs and characteristics of the gifted children/students and the forms of additional support they need to provide (Grandić, Letić, 2009).

The educational needs of students who are particularly gifted in the field of mathematics, physics and informatics are reduced to providing adequate additional support in the school (in the context of additional classes), but also necessarily to working with mentors who should be extremely skilled and trained to work with this population of students. Based on the results of this research, it is noted that parental engagement in the form of direct work with students (parents who are teachers by profession) or the engagement of mentors/private teachers has been fairly represented in the process of learning and promotion of students who are involved in the sample. However, parents of students from our sample are mainly highly educated and that besides the professional knowledge, they probably have awareness of the educational needs of their children, which they are trying to meet besides the support provided by the school and teachers. Numerous studies have shown that the intensity of early stimulation of gifted children is higher if the educational level of the parents is higher. In addition, it was found that the educational level of parents is also reflected in the motivational characteristics of gifted children. Thus, children of highly educated parents show more curiosity and affection for learning (Letić, Lingulov, 2016). But, what happens to other children who may have similar abilities but insufficiently stimulating family environment (regarding educational status), or their families are not in a position to allocate any financial resources for additional work with mentors/private teachers? These students have only the support they receive at school. In the area where the research was conducted, physics and informatics teachers, on their own initiative, provide the opportunity for all students from the city's territory to get involved in the additional classes they are organizing. The results achieved by students from our sample at the Republic Physics Competition (five students received awards), and four were additionally prepared by a Physics Teacher who provides additional classes for all students, clearly indicates that there is an expert in the field of physics, who at the same

time has a strong motivation to organize additional classes voluntarily. According to the results so far, the teacher has the third place in the country. Although the IT teacher uses the same strategy in his area, the results of the students are not as noticeable as in the field of physics. The reasons for this are multiple: competitive computer programming within the informatics is an area that is in a dizzying rise, the demands placed on students are increasing, only a small number of teachers at the state level have the knowledge needed to prepare students for the highest levels of competition, it is difficult to find mentors both among teachers and among older students (current or former competitors), etc. Also, the abilities needed to deliver top-notch results in the field of competitive programming coincide with mathematical abilities, but also imply more than that, so there is probably a smaller number of children/students with this ability structure. In the field of mathematics, there is a teacher who is dedicated and devotedly works with his students, but he himself estimates that due to the complexity of requirements at high levels of mathematics competition, one university teacher should also be engaged as a mentor who would additionally work with extremely gifted children, or a teacher who used to compete once. All three teachers point to an important resource in the city - Regional Centre for Talents. Teachers warn about small number of teachers/mentors who are ready to be associates of the Centre, mainly because of lack of financial stimulation. Similar problems were emphasized in the research done by Nikolić, Marković-Sakić and Katrina-Mitrović (2015). Mentorship in the field of mathematics, physics and informatics, within the Regional Centre for Talents, is proposed by parents, too. This model is applied in the Regional Centre for Talents "Mihailo Pupin" in Pancevo (Dejić, Čebić & Cucić, 2011). Parents are of the opinion that the organization of mentoring work within the Regional Centre for Talents with students gifted in these areas (which can be determined on the basis of previous results, or initial testing) would require certain (but not so high) financial investments, to ensure adequate conditions for students' work and certain financial incentives for teachers/mentors. If funding the work of teachers/mentors was provided at the level of local municipality, the problems that parents were facing would be solved. The best mentors would be available to all children with exceptional abilities, and local municipality would allocate financial means for it. Both teachers and parents point to the importance of additional education in the field of developmental characteristics and socio-emotional needs of gifted children, so they recommend that psychologists, as associates, are involved in the work of the Regional Centre for Talents.

Conclusion

On the basis of identified educational needs of gifted students in small community, it can be concluded that the additional support for these students in the field of mathematics, physics and informatics would include the following:

- 1) Additional school work, available to all students from the city area for each field.

- 2) Identifying teachers/mentors for each of the areas (in addition to the teachers from our sample who have been identified due to their previous work and results).
- 3) Engagement of teachers/mentors in the Regional Centre for Talents in working with students who show outstanding abilities.
- 4) Engaging psychologists in providing support to gifted students, teachers/mentors and parents.
- 5) Connecting with other centres in order to engage mentors in the fields of mathematics and informatics.
- 6) Introducing older peers into the role of mentors, especially in the field of informatics, where e-mentoring is possible (working with support of IT resources: Skype, e-mail, platform, etc.)

Significant financial resources are necessary to support gifted students and their mentors at the local level. It involves sensitizing responsible structures for the educational and other needs of gifted students. Providing adequate additional support to exceptionally gifted students in the local environment enables these children to have a chance to develop their abilities and knowledge on an equal footing with children/students who live and study in bigger cities (university centres). This would, furthermore, allow these children to stay in their families for a longer period of time (until they leave for college) instead of leaving early in search of better education. Emotional support for the family is extremely important for the development of every child, and hence it should not be allowed that gifted children are early placed in a position to choose what they need to give up - family life in favor of further development of their intellectual potentials, or vice versa. It is therefore necessary to engage all vital resources at the local level, enable their linking, but also to ensure an adequate stimulation for additional work and engagement in providing support to extremely gifted students.

References

- Alibabić, Š. (2004). Mentorstvo – strategija razvoja darovitih. Rad prezentovan na 10. okruglom stolu, *Strategije podsticanja darovitosti*, Vršac: Viša škola za obrazovanje vaspitača.
- Altaras, A. (2006). *Darovitost i podbacivanje*, Beograd: Centar za primenjenu psihologiju.
- Babaeva, J. D., & Voiskounsky, A. E. (2000). Novye informazionnye tekhnologii i problemy odarennosti (New information technologies and giftedness). In Voiskounsky, A. E. (Ed.), *Research on the Internet: Humanitarian and social aspects* (pp. 367-420). Moscow: Mozhaisk-Terra Publishers.
- Coates, L. & Stephens, L. (1990). Relationship of informatics aptitude with selected achievement measures among junior high students. *Journal of Research and Development in Education*, 23(3), 162-164.
- Dai, D. Y., & Renzulli, J. S. (2008). Snowflakes, living systems, and the mystery of giftedness. *Gifted Child Quarterly*, 52(2), 114-130.
- Dejić, M., Čebić, S., Cucić, D. (2011). Rad sa matematički darovitim učenicima - Regionalni centar "Mihailo Pupin" iz Pančeva, Naučni skup Nastava i učenje, (519-532), Užice: Učiteljski fakultet.
- Dudgale, S. (1994). Using students' mathematical inventiveness as a foundation for software design: Toward a tempered constructivism. *Educational Technology Research and Development*, 42(1), 57-73.

- Ershov, A.P. (1972). Aesthetics and the human factors in programming. *Communications of the ACM*, 15(7), 501-505.
- Grandić, R., Letić, M. (2009). Stanje, problemi i potrebe u području brige o darovitim učenicima u našem obrazovnom sistemu, 232-243.
- Letić, M., Lingulov, B. (2016). Socio-demografski činioci uspešnosti darovitih učenika, Godišnjak Filozofskog fakulteta u Novom Sadu, Knjiga, XLI-2, 215-232.
- Nikolić, M., Nikolić, Ž., Subotić, S. (2017). Ilustracija modela podrške darovitosti u oblasti programiranja, rad saopšten na 23. Okruglom stolu o darovitosti: Darovitost i kreativni pristupi učenju, Vršac: Visoka škola strukovnih studija za vaspitače „Mihailo Pavlov“.
- Nikolić, Ž., Marković-Sakić G., Katrina-Mitrović, V. (2015). Regionalni centri za talente, šansa i mogućnost u inkluzivnom sistemu obrazovanja, Rad saopšten na IV međunarodnoj konferenciji „Izazovi unapređivanja inkluzivne prakse“, Sremska Mitrovica: Visoka škola strukovnih studija za vaspitače i poslovne informatičare-Sirmijum, Institut za pedagoška istraživanja.
- Oprea, J. M. (1988). Computer programming and mathematical thinking. *Journal of Mathematical Behavior*, 7(2), 175-190.
- Overton, R. C., Harms, H. J., Taylor, L. R., & Zickar, M. J. (1997). Adapting to adaptive testing. *Personnel Psychology*, 50(1), 171-185.
- Renzulli, J. S. (2012). Reexamining the role of gifted education and talent development for the 21st century: A four-part theoretical approach. *Gifted Child Quarterly*, 56(3), 150-159.
- Štula, J. (2006). Intelektualne sposobnosti i osobine ličnosti kao prediktori uspešnosti matematički darovitih srednjoškolaca, *Psihologija*, Vol. 39 (4), 491-507.
- Zickar, M. J., Overton, R. C., Taylor, L. R., & Harms, H. J. (1999). The development of a computerized selection system for computer programmers in a financial services company. In Drasgow, F. & Olson-Buchanan, J. B. (Eds.), *Innovations in computerized assessment* (pp. 7-33). Mahwah, NJ: Lawrence Erlbaum.
- Wiczerkowsky, W., Cropley, A. & Prado, M. (2000). Nurturing talents/gifts in mathematics. In: Heller, K. A., Mönks, F. J., Sternberg, R. J. & Subotnik, R. (Eds.). *Giftedness and talent* (pp. 413-425). Oxford: Elsevier science.

IDENTIFIKACIJA OBRAZOVNIH POTREBA DAROVITIH UČENIKA U MANJIM SREDINAMA

Mirjana Nikolić¹, Željko Nikolić² i Veronika Katrina-Mitrović³

¹Visoka škola strukovnih studija za vaspitače i poslovne informatičare - Sirmium, Sremska Mitrovica

²OŠ "Kadinjača", Loznica

³Opšta bolnica, Loznica

Apstrakt

Analizom postignuća učenika na republičkim takmičenjima iz matematike i informatike u Republici Srbiji u poslednje tri godine, a ranijih godina i iz fizike, utvrđeno je da najveći broj nagrada osvajaju učenici iz velikih gradova (univerzitetskih centara). To je donekle srazmerno broju stanovnika, ali otvara i pitanje kvaliteta dodatne podrške učenicima iz manjih sredina. Zato je cilj ovog istraživanja bio da se identifikuju obrazovne potrebe darovitih učenika na lokalnom nivou. Istraživanje je sprovedeno u jednoj manjoj gradskoj sredini, polustrukturisanim intervjuom sa šest učenika VI, VII i VIII razreda koji su ostvarili plasman na republičko takmičenje iz dve od tri (ili sve tri) navedene oblasti, te individualnim intervjuom i fokusgrupnim intervjuom sa roditeljima učenika i tri predmetna nastavnika. U ostvarivanju istraživačkog cilja postavljeni su sledeći zadaci: 1) da se utvrdi doprinos škole, roditelja i drugih pojedinaca u radu sa ovim učenicima; 2) da se identifikuju eventualne poteškoće sa kojima se susreću nastavnici i roditelji u procesu pružanja podrške darovitim učenicima 3) da se utvrde preferabilni oblici dodatne podrške. Rezultati istraživanja su ukazali da, osim doprinosa pojedinih predmetnih nastavnika, veliki doprinos u radu sa decom daju roditelji/nastavnici srodnih predmeta, mentori u mestu i van mesta stanovanja učenika i vršnjački mentori. Nastavnici ističu da slaba motivacija (usled izostanka materijalne stimulacije), ali i nedovoljna znanja pojedinih nastavnika za pripreme učenika za visoke nivoe takmičenja predstavljaju ozbiljne poteškoće u pružanju dodatne podrške učenicima. Roditelji se suočavaju sa problemom pronalaženja adekvatnog mentora, kao i značajnim materijalnim ulaganjima. Dodatna podrška na lokalnom nivou treba da se zasniva na identifikovanju i materijalnoj stimulaciji nastavnika/mentora, kao i stručnjaka u oblasti darovitosti (psihologa) koji bi bili saradnici Regionalnog centra za talente, ali zahteva i značajna materijalna sredstva iz gradskog budžeta.

Ključne reči: daroviti učenici, dodatna podrška, Regionalni centar za talente, finansije

UDC 159.954-056.45

37.014.3

Original scientific paper

GAME MODEL - ENCOURAGING CREATIVITY AND INNOVATION

Zdravko Zivković¹ & Teodora Zivković²

¹*Scientific Center for Creative Development Ideall, Novi Sad, Serbia*

²*Simon Business School, University of Rochester, NY, USA*

Abstract

In the present context of globalization and the general competition, creativity (creation of new and applicable ideas) and innovation (profitable implementation of creativity) became a condition of survival. On this occasion, the European Parliament and the Council of Europe adopted a document introduces a system organized to stimulate creativity and innovation in the Member States at all levels of education. Contemporary creative techniques emphasis on creating an environment that stimulates the imagination and therefore generates more fresh - new ideas. The education system has, in addition to good quality base, also the certain disadvantages, related to the ability of expression of creativity. One of the disadvantages of the traditional system of education is mostly learning facts, with an emphasis on the knowledge test based on the system "right - wrong". Study research has shown that the introduction of games as teaching methods is indispensable for the development of creativity and innovation, stimulation of original ideas and changing perceptions of risk - the release of fear of failure.

The educational system of each country has an important role to prepare pupils/students for responsible tasks in the future life for community welfare, offering the necessary knowledge adoption and practice acquisition. However, the knowledge per se is not enough for new challenges and unknown situations that can occur in upcoming times. The progress of civilization requires new ideas and their implementation for a brighter prosperity of each and every citizen. It is not smart to deal only with knowledge during the education and leave the creation of fresh ideas for the times when students become employees and use their brain only for the wealth of their companies.

On the other hand, the need to strengthen the creative and innovative competencies to effectively meet the challenges of globalization and increased competition significantly enlarged the demand of fresh ideas in most market oriented companies, especially the ones that wish to establish or keep the leading position on the global and/or local market. Thousands of dollars are spent for research and development of new product/services from inner and outer sources, including employees, customers and agencies for creative development. Yet, one massive source is not used at all or at least not enough - student's imagination. Students are fed with a lot of facts, but often have no chance to think creatively

and express their own ideas about different issues. Having in mind that the most attractive activities for the students are playing games, a relaxing act opposite to memorizing facts, we opted for a game as a method to stimulate their creativity. That initiated the creation of a new, original model that can provide the functional creativity, which will generate new and applicable ideas for the efficient, prosperous and sustainable development. We will use experimental method for our research, and then conduct a comparative analysis of the experimental and control groups.

Key words: creativity, innovation, effectiveness, game, doris tool

Introduction

Education, Efficiency, and Effectiveness

One of the most important inventions in human history according to the general opinion is the Gutenberg printing press from 1450, which has enabled the spreading of knowledge and ideas across the progressive world. Instead of the slow manual transcription, copying or printing individual fixed wooden panels, a new machine with movable type surface enabled fast reproduction and distribution of books and pamphlets. Knowledge has become widely available, provided the education a strong basis for further expansion. From then on, much has changed in the world, especially in the 20th century when technological development has reached unimaginable proportions. During last 50-60 years technology has become the key locomotive of the global economy. Knowledge, thanks to the development of modern communications, especially the Internet, is available virtually to everyone, in every corner of the Earth, and every day is enriched with new insights, information and facts.

The question is whether today's education system promptly follows the daily changes and responds to the demands of the modern market, which in conditions of global competition seeks staff who are able to provide continuity of successful business, launching new products and services, as well as expanding into new markets.

A typical system of education in Western civilization is based on memorizing: learn, remember and repeat. „Most of a child's time at school is devoted to the acquisition, retention and testing of knowledge. Children learn methods and facts and are then tested on how well they can apply those methods and remember those facts.“ (Sloane, 2006) The dilemma is whether it is still enough to learn a lot of facts, given that knowledge is continually updated and changes. In this respect the difference between the efficiency and effectiveness should be noted.

„An educational system emphasized efficiency over effectiveness. We were taught that getting the right answer was far more important than knowing why it was right. If we do not know why an answer is right, we cannot use the knowledge effectively. We can use it to get the results we want.“ (Donalee, 2003) The best ally of knowledge is curiosity. „One of the most important creative skills we need to learn is the art of questioning. We should question everything, every cherished assumption, every rule

and method." (Sloane, 2006) Learning the facts, with no curiosity to discover something new, leads to stagnation, knowledge does not expand in scope and content, which means there's no progress. „The important thing is not to stop questioning.“ (Albert Einstein)

Since many facts about the world and the processes around us are complementing with new insights, changing due to new information or even reversed (in case they have been ineffective in practice), with a high speed, almost every day, the knowledge acquired in school is more or less far lagging behind the actual fact. Students in these conditions, "are fed" with a myriad of facts, a part of which is completely useless in modern conditions, and a good portion (the newer data) can be easily found on the Internet.

In these circumstances it is important to understand the difference between the concepts of efficiency and effectiveness. „In a 24 - hour day, we all have 24 hours. How we use those hours, and the minutes that make them up, can be measured in terms of efficiency and effectiveness. If we're running around getting a lot done, we may be very efficient but not particularly effective. In "The Effective Executive", (Peter Drucker, 2006) defined efficiency as "getting things done right" and effectiveness as "getting the right things done." Because time is limited, it makes more sense to do the "right things" than to simply do "things right." (Donalee, 2003)

Learning facts and remember them belongs into the category of efficiency: a student can learn, for example, all the lessons by heart and reproduce word by word exactly, in which case will be regarded as an excellent example of a good student; on the other hand, if the lessons that he had learned by heart, he doesn't know how to use it in the near future in order to achieve a measurable effect (for instance for the company in which he is employed) the lessons are going to be totally useless, and the time spent for their memorizing is a waste of time. If the student can draw at least one precept from these lessons, he will be able to creatively apply it and that would have a greater effect: the student would be satisfied, and the remaining time he could devote to other things.

Games and Creativity

In 1958 Albert Schreiber wrote an article in the Journal of the Academy of Management about "another new teaching technique" which was said to offer "attractive possibilities for improved learning experiences" (Schreiber, 1958). "This new technique was the use of games" (Verzat et al., 2009). In the literature, the nine-dot puzzle problem - frame of reference (Akin, Ö., Akin, C., 1998) and the Mutilated Checkerboard (MC) problem (Kaplan, C.A., Simon, H.A., 1990) are well known examples of games that require creativity to be solved.

One of the most popular games is Lego. When testing the technical schools in the north of France, „the use of Lego was found appealing to the students and provided an excellent medium for teaching design, programming skills, and creativity.“ (Verzat et al., 2009). In other cases, which is investigating in the companies Nokia, Daimler - Chrysler, Ikea, and Alcatel, Kimberly Jaussi concluded that "legos work because they let executives visualize abstract concepts like 'value chain' or 'process engineering' by actually building their

interpretations of them" (Sawyer, 2006) "Different games can be used with different teaching objectives in mind." Special creative games should be able to "influence creativity and imagination, stimulate original and innovative ideas, or alter risk-perception is warranted. (Verzat et al., 2009).

Some authors of classical understanding suspiciously ask: How can the puzzles improve mental agility? "Precisely because it is innocuous. Puzzles give pleasure in much the same way that jokes do. They create suspense and a mild anxiety, lead us astray, and surprise us with counterintuitive answers. Puzzles stimulate the imagination in ways that logical reasoning cannot." (Donalee, 2003). Games can create 'imaginary worlds and hypothetical spaces where players can test ideas and experience their consequences' (Squire & Jenkins, 2003). Play commonly signifies a form of activity with three intrinsic features. It is separable from everyday life (especially as against "work"; it exists within a "magic circle"), safe ("consequence free" or non-productive), and pleasurable or "fun" (normatively positive) (Malaby, 2007). „Play appears to be a creative process in the nature of humor. This is supported by the fact that play and humor are constituted by the same general mood of cheerfulness and enthusiasm and that neither the playful or humoristic situation last beyond the moment they occur.“ (Hammershøj, L. G., 2014)

Study research has shown that the introduction of games as teaching methods is indispensable for the development of creativity and innovation, stimulate original ideas and changing perceptions of risk – the release of fear of failure. On one hand a game is taken very seriously by the players, but at the same time the players remember that "it is only a game". The game is relaxing and entertaining precisely because it relieves us from the burden of decisions making "in the real world", and allows participants to remain creative (Heifetz, 2010).

Purposes of the Study

The subject of this research is an attempt to find ways of providing functional creativity that will generate new, original and applicable ideas in the function of effective and efficient, prosperous and sustainable development.

The aim of the research is to check the effectiveness of the GAME model and a tool based on this model on fostering functional creativity.

Research hypotheses

By applying tools based on the GAME model it is possible to improve the development process of new products that allow the schools or companies anywhere in the world to increase the level of creativity in designing new and innovative products (generating ideas), identification and evaluation of non-articulated idea (perception and evaluation) for the design of new and innovative products based on the accepted concept development for existing, potential or completely new markets. Based on the object and purpose of the research, the basic and specific research hypotheses are defined.

Hypotheses.

H1: The use of the tool based on the structured GAME model causes increasing creativity of users.

Specific / distinctive methods for hypothesis H1

H1.1: There is a significant difference between the experimental and control groups in the total number of generated ideas in terms of creative problem solving ideas.

By measuring the number of generated ideas and comparing these numbers for the experimental and control group, the hypotheses will be confirmed or denied.

Setting the game model

The environment and the needs of the modern world in the 21st century are characterized by globalization, competition on the national and global level, the dynamic changes in technologies, communications, markets, people's preferences etc., and all of that together affects the economy. We need a model of creativity that would be universally applicable, while at the same time provides a stimulating creativity, both for students in schools and for managers and employees in the companies.

Driven by this goal, we propose a new approach and a new model of creativity: the GAME model. The GAME is an acronym of four interrelated elements: Globalization, Authenticity, Medicalization and Edutainment. In short, the GAME model emphasizes the necessity of respecting the criteria that create basic preconditions for the creation of tools to facilitate and accelerate the process of generating new ideas: a globally acceptable, authentic, with the medical effects, as well as the educational effects that are entertaining and entertainment that educates.

The modules of the GAME model are:

G - Globalization i.e. coverage of the whole world (the Globe).

A - Authenticity i.e. originality, uniqueness, singularity. In addition to the originality of the design that should be significantly improved in comparison to existing products, it should allow any user to create their own, authentic solution.

M - Medicalization i.e. treatment of the social or mental problems. A product should have a curative effect / impact on the prevention and slowing diseases like dementia and stress, or be used for mental recreation.

E - Edutainment (the convergence of education and entertainment - Wolf , M.J. 1999). Edutainment is a demand for education that entertains and entertainment that is designed to educate.

A tool for fostering creativity, based on the GAME model, should be acceptable for any individual, in any school or a company in the world, regardless of the characteristics such as language, alphabet, education, experience, gender etc. Having in mind these differences between people and the desire for expression of unique personalities, a tool must allow each individual an authentic expression without repetition over a long period of time; otherwise saturation will occur, with no challenge, and no new ideas. Third, an individual student or employee is faced with a lot of

problems in the school or workplace, at home and in the overall environment, so being mentally burdened in this state, under stress, trying to deal with all the challenges and tasks, they are not able to commit to the creative thinking that requires full concentration. The tool has to virtually separate the individual person from everyday problems and thus relieve them of stress, allowing creative thinking. Fourth, the use of the tool has to be fun: it has to allow users to use it at their own will; coercion causes resistance to participation in the creative process. Additional quality of the tool should be an educational function, so that the user can improve cognitive abilities while having fun, and that educational moment can raise the value and appreciation of the tools in the eyes of the user.

Doris tool meets all 4 criteria: (G) it is based on a universal language of basic colors; (A) everybody can create their own figure – authentically genuine work; (M) DORIS allows participants a virtual journey to the imaginary world, released from the pressure of wrong decisions and fears of failure; (E) Doris have an entertaining character, providing satisfaction and it offers educational contents - practical 'lessons' from combinatorics: there are 10^{36} (ten to the power of 36) possible combinations for 24 octagons in three colors, while Rubik's cube 3x3 has "only" 10^{23} .

All of the above requirements and attributes of the tool have a key goal – to encourage each user to find hidden ideas that are stored somewhere or initiated by its use, to emerge in the daylight and allow the school or a company to, by evaluating generated ideas, their selection and implementation, ensure its survival and prosperity in an increasingly competitive market.

Through the operational process of imagination, students develop new and creative ideas that can lead to the generation of products or concrete objects. This process provides students with opportunities to explore the world, identify their interests, find solutions to problems, and further develop abilities that are necessary for the future (Ho H.C. et al., 2013). Based on these assumptions, we used a specially designed tool to stimulate student's imagination and applied a combination of two types of creativity trainings: (a) creativity training which is concentrated on developing participants' creativity and (b) sessions of creative problem solving— based on work with heuristics, tactics and strategies of creative problem-solving. (Karwowski, M., Soszynski M., 2008)

Research methodology

The sample

50 high school students - two groups of 25 students (aged 15-16): divided in an experimental group and in control group.

The difference between the experimental and the control group was the game they are allowed to use: Doris tool or Rubik's cube. Since the all participants were familiar with the Rubik's cube, we introduced a new game Doris as a test variable to the experimental group, while the control group does not receive the test variable.

Research process

The aim of the experiment is to give participants the possibility of expressing unlimited imagination, with no limits and barriers. All students were divided into two groups – the experimental and control group of 25 people. The exercise takes 60 minutes and each participant in the experimental group is given a Doris (award winning game – the best puzzle of the year 2009 by US Games Magazine - For Creative Minds at Play) set of 24 pieces, while students from control group were given Rubik's cube 3x3x3.

While Doris tool meets all 4 GAME model criteria, Rubik's cube do not meet all 4 criteria: Authenticity is missing, since Rubik's cube don't offer a possibility for making creative designs and showing authenticity but rather a right and wrong solution, so Rubik's cube do not enhance student's imagination.

The first 45 minutes, participants in experimental group used Doris tool to make free-form figures (making concrete shapes from their imagination by 24 Doris pieces), while participants from a control group were invited to make solid patterns (same color sides) using Rubik's cube. The rule in the experimental group was: "there is no wrong solution" but only good, better and the best.

The last 10 minutes, participants from both groups were invited to answer the following question: "if I had a 10 million Euro, in what new product/service I would invest that money to ensure personal sustainable way of life and prosperous future of a mankind?" They did not obliged to elaborate the ideas, just to write out short description, whatever cross their mind.

We have used experimental method for our research, and then conducted a comparative analysis of the experimental and control groups: the results of two groups were their creative ideas for new products/services.

Creativity measures

When the participants finished their list of fresh ideas for new products/services, we simply counted the number of ideas for each group and compared the results of the two groups.

Table 1: Number of new ideas generated - total and average per participant

	Experimental group	Control group
Total number of new ideas	236	138
Average number of new ideas per participant	9,44	5,52

The results are obvious: while participants in the experimental group, who used Doris tool for stimulation of creativity, generated 236 ideas in the creative problem solving phase of the experiment i.e. 9.44 ideas per

participant, in the control group, who used a Rubik's cube, participant have generated 138 ideas or an average number of 5,52 ideas per participant. The relation between the results (measured by number of ideas) of two groups is 1,71 : 1.

Results

Idea Generation

The total number of ideas generated that way in the experimental group has surpassed even the most optimistic predictions, and the subsequent analysis and evaluation of the collected ideas showed that about 5% of the idea comes from far beyond the standard framework of thinking (out of the box) and potentially could be applied in solving the issues of life. The students-participants have showed great satisfaction that they had the opportunity to express their ideas, because as they all admitted they were never asked to do anything like that before; the creative workshop they assessed as interesting and extremely helpful and they also think that it should be included in regular school activities.

The above mentioned results from the experimental group (Doris tool) were compared to the results of the control group (Rubik's cube). Based on the t-test for independent samples, the significance of differences between experimental and control groups in the number of ideas was tested.

Table 2: Differences between the experimental and the control group in the number of ideas

Ideas	group	AS	SD	t(2065)	p
Ideas for improving existing products	E	2.37	2.06	-25.63	.000
	C	5.75	3.73		
Ideas for new areas of application of existing products	E	10.55	5.83	22.07	.000
	C	5.71	3.92		
Brand new products which are not produced yet	E	12.41	8.20	32.09	.000
	C	3.42	3.60		

E stands for an experimental group, **C** stands for a control group

Discussion

Einstein said: "When I examine myself and my methods of thought, I come to the conclusion that the gift of fantasy has meant more to me than my talent for absorbing positive knowledge." Ideas, relationships, connections, and dreams lie just below the surface, waiting to be perceived and unpacked. (Caine, G., 2004).

Providing an open and relaxing atmosphere classroom, without any kind of pressure, students feel free to play as they used to as a little children in the kindergarten. This is the opposite of regular classes where students expect to be tested at any moment and feel a more or less degree of anxiety. This is the first preposition. Complete freedom of choice for the participants of the experimental group in number and forms of the figures they make is an additional contribution to the relaxing atmosphere. Using 24 octagonal Doris pieces to arrange a shape of their own will, without previous experience, students needed to use their imagination to join parts into a whole picture. The self-confidence is increasing every time the moderator encourages students to continue that way: an average time to make a first shape was around 10 minutes, but each time moderator photographed the figures and confirm the shape is OK student needed less time to finish next shape, so at the end even more complicated figures were finished after 1 minute or less. This is a very important point, because the lack of self-confidence is one of the main barriers of creativity. "Roughly half of the people surveyed believe they have skills in creativity while the other half is filled with doubts about their creative abilities. One of the fundamental principles of Innovation is 'Believe in Creativity'. As many great psychologists will tell you, "If you think you can, you can and if you think you can't, you can't!" (Dundon, 2002). Doris tool, based on a simple rule of matching colors enables every student to be creative and strengthen the belief in their own creative ability. Many ideas remain unspoken because of lack of confidence and belief in their value. On the other hand, the control group has no possibility to express their creative since the task was to solve pre-determined task - arrange 26 pieces to get as much as possible sides of a cube in the same color (1 to 6). The solution how to solve Rubik's cube is only one and it is available on the Internet, so students were able to repeat the solution they found and memorized or try to solve it by themselves.

Students in the experimental group didn't need to be artists to make figures that look like an artistic work. What makes their work artistic is their imagination. The fact is that there are two hemispheres of the brain: the "right brain" and "left brain". Roger Sperry won the 1981 Nobel Prize in Medicine for his groundbreaking work in the area of brain dominance. „Each side, or hemisphere, of the brain possesses specialized and differentiated functions. The left side of the brain is thought to dominate language, logic, and scientific and analytical tasks, while the right side of the brain is thought to dominate visual, spatial, and artistic tasks. Over time, the right brain has become associated with creativity. (Dundon, 2002). Some studies have indeed shown that the right hemisphere seems to be involved more in case of an Aha! flash of insight. For instance, one study

(Bowden, E.M. & Jung-Beeman, 2003) found that activity was greater in the right hemisphere when participants solved a task via insight, rather than piecemeal. Another showed that brief exposure to a puzzle clue was more useful to the right hemisphere, than the left, as if the right hemisphere were nearer the answer (Jung-Beeman et al., 2004). The latest researching results showed that both brain hemispheres are needed for creativity.

These creativity trainings with Doris tool are focused on increasing participants' creative potential and creative abilities. Making figures by arranging 24 Doris pieces, students engage their spatial and visual cognitive abilities, i.e. the right side of the brain. The very important fact is that each and every student – participant of the experiment - was able to make numerous figures of their choice, and felt very proud and satisfied with their work. Encouragement by teacher to continue that way, photographing all works and the basic rule repeated perpetually that “there is no wrong solution” but only good, better and the best, made participant very stimulated to try their best to make original figure and show their creativity. The figures they made look like art. Like the painters see the same thing in many different ways, participants made the figures of various things in so many different ways, but each of them was different and created by personal sense of participants. “Grounding in the arts is a superb way of supporting the capacity to see beyond the obvious and dance with possibility”.(Caine, G., 2004)

Conclusion

The usage of Doris tool based on a GAME MODEL showed that such an imaginative game could raise an interest for the expression of creativity in schools, could build self-confidence of the participants, and enhance creative ways of thinking. The students-participants were in the shoes of decision-making persons and allowed to express their own ideas how to make the world a better place. They were extremely happy to have that chance and unlike the classic repetition of facts they really enjoyed the opportunity to express their unspoken wishes that nobody ask them to do it before. It's an encouraging fact that the majority of the generated ideas was the result of imagination and focused on radical innovation or new fields of implementation of existing technologies. On the other hand, Rubik's cube didn't offer a possibility for making creative designs and showing authenticity but rather a right and wrong solution, thus making majority of students frustrated when the right solution wasn't found easy, so after that play Rubik's cube did not enhance their imagination and build up their visual and spatial cognitive capabilities.

Acknowledgement

We would like to thank to the Regione Autonoma Friuli Venezia Giulia and the Liceum “Dante Alighieri” – Trieste for supporting and for participating in the research project “GAME model - encouraging creativity and innovation” conducted in May 2017.

References

- Akin, Ö., Akin, C. (1998). On the process of creativity in puzzles, inventions, and designs, *Automation in Construction*, 7, 123-138
- Bowden, E.M. & Jung-Beeman, M. (2003). Aha! Insight experience correlates with solution activation in the right hemisphere, *Psychonomic Bulletin & Review*, 10, 730
- Caine, Geoffrey (2004). *Getting it! Creativity, Imagination, and Learning*, Independent School, Vol. 63, Issue 2, 10 - 18
- Donalee Markus (2003). *Retrain Your Business Brain: Outsmart the Corporate Competition*, Dearborn Trade, A Kaplan Professional Company, Chicago, IL, USA
- Drucker, P. (2006). *The Effective Executive: The Definitive Guide to Getting the Right Things Done*, Harper Collins Publishing, NY
- Dundon, Elaine (2002). *Seeds of Innovation: Cultivating the Synergy That Fosters New Ideas*, AMACOM Books, Saranac Lake, NY
- Hammershøj, L. G. (2014). Creativity in education as a question of cultivating sensuous forces, *Thinking Skills and Creativity* 13, 168-182
- Heifetz Aviad (2010). Games and science, *Games and Economic Behavior* 68,791
- Ho, H.C., Wang, C.C., Cheng, Y.Y. (2013). Development of the scientific imagination model: A concept-mapping perspective, *Thinking Skills and Creativity* 10, 68 - 78
- Jung-Beeman, M. et al. (2004). *Neural Activity When People Solve Verbal Problems with Insight*, Retrieved from <https://doi.org/10.1371/journal.pbio.0020097>
- Kaplan, C.A., Simon, H.A. (1990). In search of insight, *Cognitive Psychology*, 22, 374-419
- Karwowski, M., Soszynski M. (2008). How to develop creative imagination? Assumptions, aims and effectiveness of Role Play Training in Creativity (RPTC), *Thinking Skills and Creativity*, 3, 163-171
- Malaby, Thomas M. (2007). Beyond Play: A New Approach to Games, *Games and Culture*, 2, 95-113
- Sawyer R. Keith (2006). *Explaining Creativity: The Science of Human Innovation*, Oxford University Press, Cary, NC, USA
- Schreiber, A. (1958). *The theory and application of the management game approach to teaching business policy*, The Journal of the Academy of Management, 1(2)
- Sloane Paul (2006). *Lateral Thinking: Unlocking the Creativity and Innovation in Yourself and Your Team*, Kogan Page Ltd., London, GBR
- Squire, K., & Jenkins, H. (2003). *Harnessing the power of games in education*, Insight (Journal from the Institute for the Advancement of Emerging Technologies in Education). 3, 3-31
- Verzat, Byrne, and Fayolle (2009). *Tangling With Spaghetti: Pedagogical Lessons From Games*, Academy of Management Learning & Education, 8 (3)

GAME MODEL - PODSTICANJE KREATIVNOSTI I INOVATIVNOSTI

Zdravko Živković¹ i Teodora Živković²,

¹Naučni centar za kreativni razvoj Ideall, Novi Sad, Srbija

²Simon Business School, University of Rochester, NY, USA

Apstrakt

U sadašnjem kontekstu globalizacije i opšte konkurencije, stvaralaštvo (kreiranje novih i primenljivih ideja) i inovacije (profitabilna implementacija kreativnosti) postali su uslov opstanka. Iz tih razloga, Evropski parlament i Savet Evrope usvojili su dokument koji uvodi organizovani sistem za podsticanje kreativnosti i inovacija u zemljama članicama na svim nivoima obrazovanja. Savremene kreativne tehnike naglašavaju neophodnost stvaranja okruženja koje stimuliše maštu i stoga stvara sveže - nove ideje. Obrazovni sistem, pored dobrih kvaliteta, ima i određene nedostatke, koji se odnose na sposobnost izražavanja kreativnosti. Jedan od nedostataka tradicionalnog sistema obrazovanja je uglavnom učenje činjenica, sa naglaskom na testu znanja zasnovanom na sistemu "ispravno - pogrešno". Studijsko istraživanje je pokazalo da je uvođenje igara kao nastavnih metoda neophodno za razvoj kreativnosti i inovacija, stimulisanje originalnih ideja i promenu percepcije rizika - oslobađanje straha od neuspeha.

Obrazovni sistem svake zemlje ima važnu ulogu da pripremi učenike / studente za odgovorne zadatke u budućem životu za dobrobit zajednice, pružajući mogućnost usvajanje neophodnih znanja i sticanje veština. Međutim, znanje samo po sebi nije dovoljno za nove izazove i nepoznate situacije koje mogu nastati u budućim vremenima. Napredak civilizacije zahteva nove ideje i njihovu implementaciju za napredniji prosperitet svakog građanina. Nije pametno baviti se samo sticanjem znanja tokom obrazovanja i ostaviti stvaranje svežih ideja za vreme kada studenti postanu zaposleni i koriste svoju pamet samo za dobrobit svojih kompanija.

Sa druge strane, potreba za jačanjem kreativnih i inovativnih kompetencija kako bi se efikasno suočili sa izazovima globalizacije i povećanom konkurencijom značajno su povećali potražnju svežih ideja u većini tržišno orijentisanih kompanija, posebno onih koji žele uspostaviti ili zadržati vodeću poziciju na na globalnom i / ili lokalnom tržištu. Hiljade dolara troši se za istraživanje i razvoj novih proizvoda / usluga iz unutrašnjih i spoljašnjih izvora, uključujući zaposlene, kupce i agencije za kreativni razvoj. Pa ipak, jedan masivni izvor se uopšte ne koristi ili barem ne dovoljno - mašta učenika i studenata. Učenici/studenti se opterećuju sa puno činjenica, ali često nemaju šanse da kreativno razmišljaju i izražavaju svoje ideje o različitim pitanjima. Imajući u vidu činjenicu da su najatraktivnije aktivnosti za učenike igranje igara, opušajući užitak suprotno memorisanju činjenica, odlučili smo se za igru kao metod za podsticanje njihove kreativnosti. To je pokrenulo stvaranje novog, originalnog modela koji može pružiti funkcionalnu kreativnost, koja će generisati nove i primjenjive ideje za efikasan, prosperitetan i održiv razvoj. Koristićemo eksperimentalnu metodu za naše istraživanje, a zatim sprovesti komparativnu analizu eksperimentalne i kontrolne grupe.

Ključne reči: kreativnost, inovacije, efektivnost, igra, Doris tool

UDC 371.3-056.45::53
Original scientific paper

THE MOTIVATION OF GIFTED STUDENTS TO LEARN PHYSICS

Branka Radulović & Maja Stojanović

*Univerzitet u Novom Sadu, Prirodno-matematički fakultet,
Novi Sad, Republika Srbija*

Abstract

Contemporary didactic-methodical research is focused on defining as many factors as possible that can positively influence on the quality and quantity of student knowledge. School learning can be presented as a complex construct because it is under the influence of many factors. One of these factors is motivation. Motivation is a theoretical construct that is used to explain the initiation, orientation, intensity, consistency and quality of behavior, especially behavior directed towards a particular goal, which in the case of school learning is to increase the quality and quantity of knowledge.

The focus of this research was to examine the motivation of gifted students for learning physics. In this research gifted students of the fourth grade of the gymnasium "J. J. Zmaj" in Novi Sad were participate. For this research SMTSL questionnaire which measure five components of student motivation: self-efficacy, application of active learning strategies, understanding of the importance of physics as a science, orientation to achievement and orientation to learning was used.

The main results of the research showed that the components self-efficacy and the motivation oriented towards achievement were highly valued. The smallest value was for component understanding of the importance of physics as a science. The obtained high value of the component of self-efficacy directly points to a high level of a students' confidence in their own ability to successfully perform tasks. The high value of the component of the motivation oriented towards achievement indicates that students are aiming to compete with other students in learning natural science, getting attention of teachers, but also to achieve high marks for taking the entrance exam.

The main conclusion can be highlighted by the students' interest in all five components of the motivation examined by this test, but that the components of self-efficacy and motivation focused on achievement have been singled out separately.

Key words: gifted students, physics, motivation, self-efficacy, understanding of the importance of physics as a science.

Introduction

Contemporary didactic-methodical research is focused on defining as many factors as possible that can positively influence on the quality and quantity of student knowledge (Bandura, 1991; Hanrahan, 1998; Olić, 2016). School learning can be presented as a complex construct because it is under the influence of many factors. One of these factors is motivation. According to Olić (2016), Maehr and Meyer define motivation as a theoretical construct that is used to explain the initiation, direction, intensity, persistence, and quality of behaviour, especially behaviour directed towards a specific goal, which in the case of school learning increase the quality and quantity of knowledge (Hoffman, 2015). Because of the breadth and complexity of the definition of the concept of motivation developed numerous theories that have sought to better describe and explain this term. Therefore according to Moeed (2015), Eccles and Wigfield have classified related theories of motivation into five major categories: theories focused on expectancies for success; task value; integrate expectancies and values; integrating motivation and cognition and theories of motivation and volition. Due to the complexity of the concept of motivation and the number of theories dealing with it, several instruments have been developed in order to better determine the motivation of students. In this research, a questionnaire developed by Tuan et al. (2005) and translated by Olić, Ninković and Adamov (2016) has been applied. It involves the examination of students' self-efficacy, active learning, appreciation of Physics, motivation oriented on achievement, and motivation oriented on learning.

Methodology

The main problem of research is the documented gap between the need for physicists, as educated people who can respond to technical, technological and economic challenges, on the one hand, and the general low motivation of students for physics learning, on the other. The aim of this research was to examine the motivation of gifted students for learning physics. The goal of this subject is to develop students' ability for critical thinking, scientific reasoning and acquiring competence in solving problems. It is therefore important to examine the students' motivation for studying physics and their perception of the importance of physics in everyday life.

The aim of the research is operationalized through the following research tasks:

1. To examine the level of gifted students' motivation to learn Physics.
2. To examine the correlation between components of motivation and grades of physics at the end of the first semester, or to determine which component best explains the student's achievement in physics.

Instrument

A standardized questionnaire for students' motivation towards science learning, SMTSL, was used as an instrument for this research. This

questionnaire measures five components of student motivation, namely: self-efficacy, application of active learning strategies, understanding of the importance of physics as a science, orientation to achievement and orientation to learning. Students used Likert five-point scale was given for each question, so that they could give their (dis)agreement with the given statements.

According to valued of Cronbach alpha ($\alpha = 0.856$) the reliability of the test was also shown in our sample. The metric characteristics of the scale corresponding to the components of the motivation for learning physics are shown in Table 1.

Table 1. Metric characteristics of the scale.

	Mean	SD	Min	Max	Skewness	Kurtosis
Self-efficacy	27.26	4.90	17	35	-0.598	-0.563
Active learning strategies	30.38	5.21	17	40	-0.567	0.056
Understanding of the importance of Physics as a science	18.03	3.53	9	25	-0.237	1.891
Motivation oriented on achievement	15.41	4.13	4	20	-1.431	1.368
Motivation oriented on learning	19.09	5.59	5	25	-1.077	0.616

As can be seen from the data in Table 1, all the components have skewness and kurtosis values in the range ± 2 , which indicates a normal distribution.

Participant

In this research students of the two classes of the fourth grade of the gymnasium "J.J.Zmaj" (gifted students in mathematics) in Novi Sad were participated. The students of this direction have a special curriculum with significantly more hours of math and physics than students of natural-mathematical direction. The sample consisted of a 34 gifted students. The quantitative analysis in this paper relies on datasets obtained during the research conducted in the spring term of the academic year 2017/2018.

In this study, gender differences in students' motivation were not observed due to the lack of uniformity in the number of respondents by gender.

Statistical Analysis of Results

Statistical analyzes: descriptive statistics and the multilayer perceptron (MLP) neural network model in the program SPSS 20 were applied. MLP model was used as a binary classification method to discover factors that

had a strong influence on students' success in Physics. For this method, the data are encoded so that if the student had a grade higher than 4 it was assigned with value 1, otherwise it was the value 0.

Results of Research

Table 2 shows the mean value of the components of the motivation of gifted students in our research.

Tabela 2. Descriptive Statistics of individual components of motivation.

	Mean	SD
Self-efficacy	3.91	0.68
Active learning strategies	3.81	0.64
Understanding of the importance of Physics as a science	3.62	0.67
Motivation oriented on achievement	3.88	1.00
Motivation oriented on learning	3.82	1.12

As can be seen from Table 2, students were highly rated questions related to the component self-efficacy ($M = 3.91$, $SD = 0.68$), then the component of the motivation oriented towards achievement ($M = 3.88$, $SD = 1.00$), slightly less were application of active learning strategies ($M = 3.81$, $SD = 0.64$) and motivation orientation to learning ($M = 3.82$, $SD = 1.12$). The smallest value was for the component understanding of the importance of physics as a science ($M = 3.62$, $SD = 0.67$). The obtained high value of the component of self-efficacy directly points to a high level of a students' confidence in their own ability to successfully perform tasks (Olić, Adamov, & Babic-Kekez, 2014). It means that students by themselves evaluate their abilities, how much effort they put to solve the problem and. etc. To the extent that persuasive boosts in the perceived self-efficacy lead people to try hard enough to succeed, self-affirming beliefs promote the development of skills and a sense of personal efficacy (Bandura, 1997). The high value of the component of the motivation oriented towards achievement indicates that students are aiming to compete with other students in learning natural science, getting the attention of teachers, but also to achieve high marks for taking the entrance exam. Also, students focus on the achievement saying that they are aware that their choice of the faculty depends on their achievement in the secondary school, and, therefore, they pay special attention to this category of motivation. On our sample, the highly assessed is component oriented towards learning. The obtain result indicates that the tested high school students are focussed on learning as the essential understanding of the material. The obtained perceived value for the component, understanding the importance of physics as a science, points to the students' not noticing the real importance of physics in everyday life, although they are surrounded on a daily basis by physical laws and physical phenomena.

The relationship between students' motivation to learn physics was examined using correlation coefficient and MLP model. Table 3 shows the values of the coefficient of correlation of the components of motivation and grades of physics.

Table 3. Correlation coefficient of components of motivation and grades of physics.

	Self-efficacy	Active learning strategies	Understanding of the importance of Physics as a science	Motivation oriented on achievement	Motivation oriented on learning
Grades of Physics	0.541*	0.346*	0.346*	-0.190	0.467*

* $p < 0.05$

As can be seen from Table 3, the obtained result have shown a positive correlation of the mean strength between the grades of physics and components: Self-efficacy, Active learning strategies, Understanding of the importance of Physics as a science and Motivation oriented on learning. Therefore, the higher perceived values of self-efficacy, the motivation oriented to understanding the content of physics and the understanding of the connection with other problems and examples from life with the use of active learning strategies contribute to achieving higher achievements in Physics.

In order to better understand the contribution of the components of motivation to the explanation of student achievement in physics, MLP model neural network was applied. The applied model was obtained that area under the ROC curve 0.825 which gives us the accuracy of the model. Table 4 shows the contributions of the motivation components to the explanation of student achievement in physics measured by the final grade at the end of the first semester.

Table 4. Contribution of components of motivation to student achievement.

	Importance	Normalized importance
Self-efficacy	0,282	76,6%
Active learning strategies	0,053	14,3%
Understanding of the importance of Physics as a science	0,368	100,0%
Motivation oriented on achievement	0,255	69,1%
Motivation oriented on learning	0,042	11,5%

As can be seen from Table 4, the component of appreciation of Physics as a science is highlighted as a component that fully explains the student's achievement in Physics. So if students understand the importance and application of this science in every day, but also in professional life, they will achieve better results in the tests of knowledge. Component self-efficacy and motivation-oriented motivation are also significantly contributed to the explanation of student achievement. The graphic representation of component contribution is shown in Figure 1.

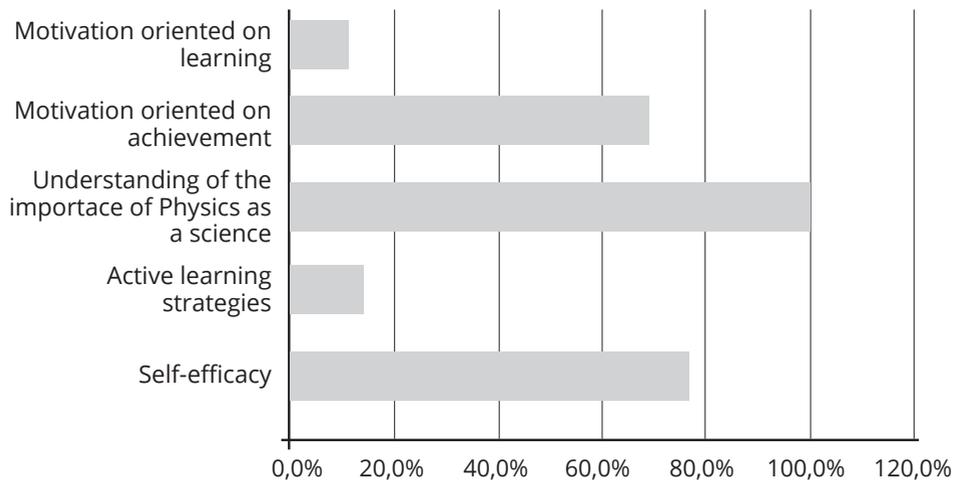


Figure 1. Normalized importance of the contribution of the components of the motive to the explanation of student achievement from Physics.

As part of the research, student aspirations were examined on the choice of studies and the science of science they want to deal with in the future. The results of the research showed that 38.2% of the respondents would like to be in the future engaged in computer science, 17.6% in natural sciences and 14.7% in technical sciences. The results showed a clear trend in the popularity of computer sciences, as an external factor.

Discussion

The research was obtained that students expressed interest in all five components of the motivation examined by this test, but that the components of self-efficacy and motivation focused on achievement have been singled out separately. The smallest value was for the component understanding of the importance of physics as a science. The obtained result indicates that the students surveyed believe that knowledge in physics is not relevant to the problems of everyday life. Because of the significance of the subject itself for the cognitive development of the child and the development of the ability of scientific reasoning, and in order to overcome this result, it is necessary for teachers to emphasize the practical value of

materials and apply them to create examples of tasks with meaningful and practically relevant data. Similar results were obtained in the studies Olić (2016) and Olić, Adamov and Babić-Kekez (2014). According to results of the research Olić (2016), the most powerful predictor of achievement in general and in inorganic chemistry is the sense of self-efficacy. The students' belief in their own ability to successfully solve the problems are related to setting goals, expectations, outcomes, selection of activities, and the willingness to put efforts, which results in higher achievement (Olić, Adamov, & Babić-Kekez, 2014).

The research has shown that the grades of physics statistically significantly correlates with the components: Self-efficacy, Active learning strategies, Understanding of the importance of Physics as a science and Motivation oriented on learning. Hence, high levels of these components follow high grades from physics. According to Lugulov (2010), a student who invests a higher mental effort exhibits a higher level of thought activity, which leads to better results in tests of knowledge. In order to better understand the contribution of the components of motivation to the explanation of student achievement in physics, MLP model neural network was applied. According to this model identifies three components: Understanding of the importance of Physics as a science, Self-efficacy and Motivation oriented on achievement. Therefore, the recognition of the importance of Physics as a science and its relevance to everyday problems and examples from life fully explains the high educational outcomes of students. Understanding the examples around them contributes to their self-confidence in their own knowledge.

Conclusion

The main conclusion can be highlighted by the students' interest in all five components of the motivation examined by this test, but that the components of self-efficacy and motivation focused on achievement have been singled out separately. The smallest value was for the component understanding of the importance of physics as a science. From the standpoint of physics, and in order to increase students' perceptions of the importance of the component understanding the importance of physics as a science, teachers need to emphasize the practical value of the materials and apply them to create examples of tasks with meaningful and practically relevant data. It is especially important to monitor how gifted students perceive certain components because they are considered one of the bearers of future social and technological changes.

Acknowledgments

The paper presents the results of the research on the project "The Quality of the Education System of Serbia in the European Perspective" No. 179010, financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

Reference

- Bandura, A. (1991). Social Cognitive Theory of Self-Regulation. *Organizational Behavior and Human Decision Processes*, 50, 248-281.
- Hanrahan, M. (1998). The effect of Learning Environment Factors on Students' Motivation and Learning. *International Journal of Science Education*, 20(6), 737-753. doi: 10.1080/0950069980200609.
- Hoffman, B. (2015). *Motivation for Learning and Performance*. San Diego, CA, Oxford, UK: Academic Press, Elsevier.
- Lungulov, B. (2010). Motivacije učenika u nastavi – pretpostavka uspeha u učenju. *Pedagoška stvarnost*, 56 (3-4), 294-305.
- Moeed, A. (2015). *Science Investigation: Student Views about Learning, Motivation and Assessment*. Springer.
- Olić, S. (2016). *Motivation and Appreciation of Learning Styles as a Determinant of Pupil Achievement in Chemistry [Motivacija i uvažavanje stilova učenja kao determinante učeničkog postignuća u hemiji]*. (Doctoral dissertation), Novi Sad: University of Novi Sad, Faculty of Science. Retrieved from <http://nardus.mpn.gov.rs>
- Olić, S., Ninković, S., & Adamov, J. (2016). Adaptation and Empirical Evaluation of the Questionnaire on Students' Motivation towards Science Learning. *Psihologija*, 49(1), 51-66.
- Olić, S., Adamov, J., & Babić-Kekez, S. (2014). Motivacija kao prediktor učeničkog postignuća u hemiji. *Istraživanja u pedagogiji*, 4(2), 24-36.
- Tuan, H-L., Chin, C-C., & Shieh, S-H. (2005). The Development of a Questionnaire to Measure Students' Motivation towards Science Learning. *International Journal of Science Education*, 27(6), 639-654. doi: 10.1080/0950069042000323737.

MOTIVACIJA DAROVITIH UČENIKA ZA UČENJE FIZIKE

Branka Radulović i Maja Stojanović

*Univerzitet u Novom Sadu, Prirodno-matematički fakultet,
Novi Sad, Republika Srbija*

Apstrakt

Savremena didaktičko-metodička istraživanja okrenuta su ka pitanju definisanja što većeg broja faktora koji mogu pozitivno uticati na kvalitet i kvantitet učeničkog znanja. Školsko učenje se može predstaviti kao složen konstrukt jer je pod uticajem brojnih faktora. Jedan od tih faktora je motivacija. Motivacija je teoretski konstrukt koji se koristi da se objasni iniciranje, usmerenost, intenzitet, postojanost i kvalitet ponašanja, posebno ponašanja usmerenog ka određenom cilju, što je u slučaju školskog učenja povećanje kvaliteta i kvantiteta znanja.

Težište ovog istraživanja stavljeno je na ispitivanje motivacije darovitih učenika za predmet fizika. Cilj ovog nastavnog predmeta da razvije sposobnost učenika za kritičko mišljenje i naučno rezonovanje. U ovom istraživanju učestvovali su učenici četvrtog razreda iz odeljenja obdarenih učenika u matematičkoj gimnaziji „J. J. Zmaj“ u Novom Sadu. Za ovo istraživanje korišćen je SMTSL (Student's motivation

toward science learning) upitnik koji obuhvata pet komponenti motivacije: samoeфикаsnost, primena strategije aktivnog učenja, shvatanje značaja fizike kao nauke, orijentacija na postignuće i orijentacija na učenje.

Glavni rezultati istraživanja pokazali su da su učenici visoko bodovali pitanja vezana za komponentu samoeфикаsnost, potom motivaciju orjentisanu na postignuće, aktivno učenje i motivaciju orijentisanu na učenje. Najmanje je bodovana komponenta shvatanje značaja fizike kao nauke. Dobijena visoka vrednost komponente samoeфикаsnosti direktno ukazuje na visok nivo uverenosti učenika u sopstvene sposobnosti uspešnog obavljanja zadataka, dok visoka vrednost komponente motivacije orijentisane na postignuće ukazuje da pri učenju gradiva prirodnih nauka učenici imaju za cilj takmičenje sa drugim učenicima, dobijanje pažnje nastavnika, ali i postizanje visokih ocena zbog polaganja prijemnog ispita.

Kao glavni zaključak može se istaći učenička zainteresovanost za svih pet komponenti motivacije ispitivanih ovim testom, ali da su se komponente samoeфикаsnost i motivacija orjentisana na postignuće posebno izdvojile. Sve komponente su jasno opisale karakteristike darovitih učenika.

Ključne reči: daroviti, fizika, motivacija, samoeфикаsnost, shvatanje značaja fizike kao nauke.

UDC 371.3-056.45::54
Original scientific paper

APPLICATION OF THE SCIENTIFIC METHOD IN TEACHING CHEMISTRY TO THE GIFTED STUDENTS

Jasna Adamov & Stanislava Olić

School of Sciences and Mathematics, University of Novi Sad, Novi Sad, Serbia

Abstract

At the "Jovan Jovanovic Zmaj" Grammar School in Novi Sad there is a special class of students of the seventh grade who are talented in mathematics, who are educated following a special curriculum. These students show additional interest in natural sciences and the expansion of knowledge outside the curriculum. The aim of this paper was to examine the possibility of teaching chemical contents by applying the scientific method of learning in the 7th grade of primary school, in a special class of gifted students. Also, the goal was to examine the students' perceptions about this mode of work. The sample of the research consisted of 20 students of the special class of the 7th grade of the "Jovan Jovanovic Zmaj" Grammar School in Novi Sad. The research was conducted during May 2016/17 school year, in a block of three school hours. The students were divided into groups and each group was given the task of examining the effects of one of the factors that influence the rate of chemical reaction. Each group of students planned the experiment and conducted it, checked their hypothesis and compiled a report. In the final part of the class, students discussed the results presented and interpreted the mechanism of the influence of certain factors on the rate of the chemical reaction. All students expressed the opinion that this kind of work is much more interesting and motivating than the traditional one.

Key words: gifted, education, chemistry, scientific method, reaction rate

Introduction

Gilbert and Newberry (2007) stated that teaching the gifted is very difficult, since it comprises very little communication of facts and a lot of asking questions, testing their understanding and guidance to suggest a solution. This requires a high level of teacher competencies. Many teachers face problems when they try to meet the learning needs of their gifted students. What is the best way to set challenge to the gifted students? How to enable them to learn complex concepts easily and quickly? How

can we stimulate their interest, develop autonomy in work, and enable them to gain greater independence in learning?

This is because a gifted and creative learner exhibits the following traits:

- Interest - a desire to solve the problem;
- Intrigue - asking questions, often original and difficult;
- Imagination - finding creative solutions;
- Persistence - motivation, self-discipline and lack of ability when faced with difficulties;
- Relevance - understanding the goal and purpose of learning.

In educating gifted students in natural sciences and mathematics, it is important to introduce the new and challenging teaching content early enough. In a study by Cross and Coleman (1992) about the attitudes of gifted students towards the study of natural sciences, it has been shown that the main objections of students relate to frustration due to the retention on already known contents, conditioned by curricula. Later studies also confirmed that gifted students needed a vertical extension of the curriculum, that is, prior introduction of content envisaged for older age levels (Hacker & Rowe, 1993).

Problem-based learning in teaching of natural sciences has been shown to be an excellent solution in working with gifted students because it equally motivates both students and teachers (VanTassel-Baska, Bass, Ries, Poland, & Avery, 1998). In the review of the study materials for the students gifted for natural sciences, Johnson, Boyce, and VanTassel-Baska (1995) have shown that materials which are particularly suitable are those that provide a balance of content and processes, and especially emphasize original students' research, development of the concepts and interdisciplinary applications of the learned. Other studies also highlight the importance of the findings based on laboratory experiments.

Natural science curricula for initial gifted education should therefore be designed to emphasize:

- *concepts*: Restructuring curricula of natural sciences by emphasizing concepts rather than facts, enables students to gain deeper knowledge of fundamental ideas necessary for understanding science and conducting science in the real world. Concepts such as systems, changes and scaling provide the basics for learning fundamental and immutable natural laws.
- *higher level thinking*: Students need to learn important scientific concepts, but also to combine these concepts in complex ways. When students understand the links and relationships between basic scientific settings and problems in the real world (for example, oil spilling into the ocean), it gives them the opportunity for critical and creative thinking in solving the given problem.
- *research and problem-based learning*: The better students build their knowledge and understanding of science, they will be more able to deal with new situations and apply appropriate scientific procedures to solve the problem. By learning through research, students are introduced to the way scientists think when they come to a discovery and develop valuable thought processes - skepticism, objectivity and curiosity (VanTassel-Baska, Gallagher, Bailey, & Sher, 1993).

- *scientific method, planning and conducting experiments*: Most of the experiments in the initial teaching of natural sciences are carried out in accordance with detailed instructions in order to confirm the previously mentioned facts. Students rarely have the opportunity to design experiments themselves. In scientific method students are required to read and discuss relevant topics, propose hypotheses that should be checked, design an experimental procedure, select the necessary accessories and materials, conduct research, re-discuss and analyze the problem and present the solution to the appropriate auditorium. Therefore, the scientific method of discovery is a challenging and intriguing approach to the learning of scientific facts, especially for gifted students.

The scientific method is a complex method that involves certain phases, assumptions and conditions in order to be successful. The elements of the scientific method are various methodical methods, with the purpose of creative creation of scientific knowledge (Gauch, 2013). The scientific method consists of a series of logical procedures (Cohen, 2013):

1. problem detection and data collection
2. setting the hypothesis
3. design of the experiment
4. conducting experiment
5. accepting / rejecting the hypothesis
6. generalization

The teaching method in education is based on the following principles (Sumida and Taber, 2017):

1. A student sees objects and phenomena from the real world and experiments with them.
2. During the research, the student is thinking and proving, discussing the results obtained, and exchanging experiences with other students.
3. The teacher is a mediator between science and students and leads the activity to make progress in the study. He helps in forming conclusions and puts them in the context of scientific knowledge. He gives information, favors the scientific method, insisting on the significance and role of the experiment. The teacher suggests ways of research by asking questions, conducting activities related to writing texts, creating conditions for constructive thinking and confrontation of students' attitudes, realization of the experiment and forming a conclusion.

Methodology

At the "Jovan Jovanovic Zmaj" Grammar School in Novi Sad there is a special class of students of the seventh grade who are talented in mathematics, who are educated following a special curriculum. These students show additional interest in natural sciences and the expansion of knowledge outside the curriculum. Since the education of gifted is focused on methods that promote original student research, concept

development, problem-based learning and findings based on research, in learning new concepts in chemistry planning and conducting laboratory experiments based on hypotheses could be a very motivating and efficient method of work.

The aim of this paper was to examine the possibility of teaching chemical contents by applying the scientific method of learning in the 7th grade of primary school, in a special class of gifted students.

The following research hypotheses were postulated:

1. Gifted students can successfully learn complex chemical content through application of scientific method.
2. Gifted 7th-graders have positive attitude towards learning chemistry through six steps of the scientific method

To examine these hypotheses, the following research tasks were defined:

1. Investigate if the gifted students in the seventh grade are able to successfully postulate a research hypothesis and plan and conduct experiments to test their hypothesis.
2. Investigate the students' perceptions about the scientific method in learning chemistry.

The work for this research was organized in four steps:

1. Selection of the educational unit for vertical expansion of the curriculum that could be successfully presented to the students through scientific method of learning. The sample of the educational content was *The rate of the chemical reactions*. This content is not planned by the syllabus, but it was introduced as a form of vertical expansion of the curriculum for gifted students of the seventh grade.
2. Preparation of the necessary materials (developing a class scenario covering the type of class, forms of teaching, teaching methods, teaching means and auxiliary technical means, goal and tasks, learning outcomes, teacher's and students' activities, time articulation of the class, correlation with other courses, and recommended literature; designing the introductory presentation with suitable films and animations; selecting laboratory equipment etc.);
3. Realization of the class (in a block of three hours) which included: introduction of the steps of the scientific method to the students; division of students into groups; group work of students on postulating hypotheses, planning and conducting experiments; writing reports and presenting results to other groups; generalization.
4. Gathering information on the students' opinion on this mode of work through a questionnaire.

The sample of participants consisted of 20 students of the special class of the 7th grade of the "Jovan Jovanovic Zmaj" Grammar School in Novi Sad. The research was conducted during May 2016/17 school year.

After completing the research, students were asked to fill in a questionnaire about their opinions and experiences in application of the sci-

entific method of learning the content related to the rate of reaction. The questionnaire consisted of five statements, and students were asked to express their agreement or disagreement with them.

Results and Discussion

Intended Learning Outcomes

For the vertical expansion unit the new learning outcomes were defined, not contained in the curriculum for the 7th grade Chemistry. They were formulated as follows:

After realization of the class, students should be able to:

1. define a chemical reaction,
2. list the preconditions necessary for a chemical reaction to occur,
3. explain the collision theory,
4. define the activation energy,
5. list the factors that affect the rate of reaction,
6. define catalysts,
7. explain the effects of temperature, concentration of reactants, the size of contact surfaces, stirring and catalysts on the rate of a chemical reaction.

Organization of Work

In the initial discussion on the conditions necessary for the chemical reaction to occur, after watching movies and animations, students came to the conclusion that the basic precondition for the chemical reaction is collision of the particles with the adequate energy content to produce new substances. After that students discussed the fact that some reactions happen very fast and some are very slow, and tried to figure out which factors can affect the reaction rate (reactant concentrations, temperature, contact surface, stirring).

Students were then divided into four groups. Each group was given the task of examining the influence of one of the listed factors on the rate of chemical reaction. The teacher explained to the students the steps of the scientific method and explained to them that they should: 1. set up a hypothesis, 2. create an experiment for testing the hypothesis, using some of the available equipment and chemicals from the laboratory table; 3. experimentally test the hypothesis and present obtained results graphically, 4. summarize the effect of certain factors on the rate of chemical reactions.

On the laboratory table the following material was prepared for students: effervescent tablets of vitamin C, zinc (granules), distilled water, solid copper(II) sulfate pentahydrate (bluestone, blue vitriol), 2% and 20% solutions of sulfuric acid, beakers, graduated cylinders, Erlenmeyer flasks, porcelain mortar and pestle, hand mixer, spoon, kettle, ice, Petri dishes, rubber balloons, stopwatches, safety goggles, safety gloves.

Each group considered the selection, figured out what of the given materials they could use to test their hypothesis, discussed their proposal with the teacher and chose the chemicals and laboratory equipment necessary for conducting the experiment.

Next, each group of students performed the planned experiment, checked their hypothesis and compiled a report, and one of the group members reported the results to other students.

Group 1: Effect of temperature on reaction rates

The students postulated the *hypothesis*: "The increase of temperature speeds up the reaction".

For testing this hypothesis, students chose the following *materials*: effervescent tablets of vitamin C, distilled water, three beakers, three Erlenmeyer flasks, kettle, ice, three stopwatches.

The experiment was designed and conducted as follows:

Three samples of water were prepared in three beakers: 1. water of the room temperature, 2. boiling water, 3. ice-cold water, and 100 ml of each sample was poured into three Erlenmeyer flasks. Three effervescent tablets were then added simultaneously into the flasks, and the rate of the reaction was monitored measuring the time needed for a tablet to completely react (which was observed by the size of the tablet remains, the yellow colour of the solution and production of gaseous products).

Results: The shortest reaction time was observed in the flask containing hot water, and the longest – in the flask with icy water. This confirmed the hypothesis that the increase of temperature increased the reaction rate.

Group 2: Effect of reactants concentrations on reaction rates

The students postulated the *hypothesis*: "The higher the concentrations of reactants, the higher the reaction rate".

For testing this hypothesis, students chose the following *materials*: zinc (granules), two solutions of sulfuric acid (2% and 20%), graduated cylinder, two Erlenmeyer flasks, two rubber balloons.

The experiment was designed and conducted as follows:

Using graduated cylinder, the volume of 10 ml of 2% H_2SO_4 was measured and transferred into the first Erlenmeyer flask, and the same volume of 20% H_2SO_4 was poured into the second flask. Three granules of zinc were put into each of the balloons, and the balloons were fastened to the tops of Erlenmeyer flasks. By lifting the balloons over the flasks, zinc granules were simultaneously transferred into the flasks, starting the reaction. The reaction rate was monitored by the volumes of hydrogen gas which was produced, causing the balloons to inflate.

Results: More hydrogen was produced in the reaction system with 20% H_2SO_4 solution. This confirmed the hypothesis that the increase of reactant concentration increased the reaction rate.

Group 3: Effect of reactants contact surface on reaction rates

The students postulated the *hypothesis*: "The larger the contact surface of reactants, the higher the reaction rate".

For testing this hypothesis, students chose the following *materials*: effervescent tablets of vitamin C, distilled water, three beakers, porcelain mortar and pestle, three Petri dishes, three stopwatches.

The experiment was designed and conducted as follows:

Three effervescent tablets were taken for the experiment. One was ground into powder in a mortar, the second was broken into several small pieces, and the third remained a whole. They were transferred into Petri dishes and then added simultaneously into three beakers filled with same volumes of water (100 ml), and the rate of the reaction was monitored measuring the time needed for a tablet to completely react (which was observed by the size of the tablet remains, the yellow colour of the solution and production of gaseous products).

Results: The tablet which was powdered reacted the fastest, and the last to react was the whole tablet of vitamin C. This confirmed the hypothesis that the increase of reactant contact surface increased the reaction rate.

Group 4: Effect of stirring on reaction rates

The students postulated the *hypothesis*: "If the reaction mixture is stirred, that increases the reaction rate".

For testing this hypothesis, students chose the following *materials*: copper(II) sulfate pentahydrate (bluestone, blue vitriol), distilled water, two beakers, hand mixer, spoon.

The experiment was designed and conducted as follows:

Two beakers were filled with distilled water (100 ml). The same amounts of solid bluestone (1 spoon) were added into beakers. The content of the first beaker was stirred using a hand mixer for 5 minutes. The rate of the reaction was monitored by the intensity of the blue colour of the solutions after 5 minutes and the amount of undissolved bluestone in the beakers.

Results: Bluestone in the first beaker was completely dissolved after 5 minutes. In the second beaker blue precipitate (undissolved bluestone) was observed, and the colour of the solution in this beaker was less intensive. This confirmed the hypothesis that the stirring of the reaction mixture increased the reaction rate.

Teacher's activity: Effect of catalysts on reaction rates

The teacher postulated the *hypothesis*: "Presence of catalysts increases the reaction rate".

Since the terms "catalysis" and "catalysts" were unfamiliar to the students, the teacher introduced and defined the term "catalyst", and explained that catalysts can also speed up a chemical reaction. The teacher gave an example of a catalyst for the reaction of decomposure of hydrogen

peroxide, which is a very slow process under normal conditions. However, in the presence of a catalyst such as manganese-dioxide, this reactions becomes very fast, and can be observed by vigorous production of oxygen gas. The teacher conducted this experiment, which confirmed the hypothesis that the presence of a catalyst increased the reaction rate.

Generalization

In the final part of the class, students discussed the presented results and interpreted the mechanism of the influence of certain factors on the rate of the chemical reaction.

Students' Opinions on Application of Scientific Method in Learning Chemistry

All students had positive attitude towards scientific method in learning chemistry:

- 100% of the student sample expressed the opinion that this kind of work is much more interesting and motivating than the traditional one;
- 95% of them thought that they learned more and better memorized the content;
- 90% also liked teamwork and cooperation;
- 95% enjoyed conceptualization and conducting of the experiment;
- 80% of the students had more self-confidence after conducting the research (in laboratory skills, and oral and written communication).

Conclusion

Gifted and talented children and young people, due to their premature development, intensity and complexity, require differentiation in the curriculum, which will enable them to develop their full potential. They need accelerated and enriched learning, in line with their level of giftedness and talent. Such an approach can be provided by programming models that focus on academic abilities and acceleration or those that focus on creative productivity and enrichment

In this paper the application of the scientific method of inquiry in learning new chemistry content is described as a method of teaching chemistry to the gifted students. By introducing a scientific method in teaching, students adopt a certain way of thinking (hypothesis setting, their experimental confirmation, conclusions and solving problems), which makes it easier to solve the problem, not only in science, but in everyday life.

Scientific method is a powerful tool, but it has its limitations. These limitations are based on the fact that the hypothesis must be proven or denied, and that experiments and observations can be repeated. This puts some topics out of the reach of the scientific method.

In this research, all students expressed the opinion that this kind of work is much more interesting and motivating than the traditional one. They thought that they learned more and better memorized the content,

and also liked teamwork and cooperation. Self-conceptualization of the experiment within the scientific method of learning develops creative thinking, strengthens self-confidence in students, and teamwork develops responsibility, tolerance and the skill of oral and written communication.

Acknowledgements

Research described in this paper is a part of the national project of the Ministry of education, science and technological development of the Republic of Serbia: *Quality of the educational system of Serbia in the European perspective – KOSSEP (179010)*.

References

- Cohen, M. F. (2013). *An introduction to logic and scientific method*. Read Books Ltd.
- Cross, T.L., & Coleman, L.J. (1992). Gifted high school students' advice to science teachers. *Gifted Child Today*, 15 (5), 25-26.
- Gauch, H.G. (2003): *Scientific Method in Practice*. Cambridge University Press, Cambridge.
- Gilbert, J. K., & Newberry, M. (2007). The characteristics of the gifted and exceptionally able in science. In K. S. Taber (Ed.), *Science education for gifted learners* (pp. 15-31). London: Routledge.
- Hacker, R.G., & Rowe, M. J. (1993). A study of the effects of an organization change from streamlined to mixed-ability classes upon science classroom instruction. *Journal of Research in Science Teaching*, 30 (3), 223-31.
- Johnson, D., Boyce, L., & VanTassel-Baska, J. (1995). Evaluating curriculum materials in science, *Gifted Child Quarterly*, 89 (1), 35-43.
- Scott, P. H. (2007). Challenging gifted learners through classroom dialogue. In K. S. Taber (Ed.), *Science Education for Gifted Learners* (pp. 100-111). London: Routledge.
- Sumida, M. (Ed.), Taber, K. S. (Ed.). (2017). *Policy and Practice in Science Education for the Gifted*. London: Routledge.
- VanTassel-Baska, J., Bass, G., Ries, R., Poland, D., & Avery, L. (1998). A national study of science curriculum effectiveness with high ability students. *Gifted Child Quarterly*, 42(4), 200-211.
- VanTassel-Baska, J., Gallagher, S., Bailey, J., & Sher, B. (1993). Scientific experimentation. *Gifted Child Today*, 16 (5), 42-46.

PRIMENA NAUČNOG METODA SAZNAVANJA U NASTAVI HEMIJE S DAROVITIM UČENICIMA

Jasna Adamov i Stanislava Olić

School of Sciences and Mathematics, University of Novi Sad, Novi Sad, Serbia

Apstrakt

Pri Gimnaziji "Jovan Jovanović Zmaj" u Novom Sadu postoji specijalno odeljenje učenika sedmog razreda talentovanih za matematiku, sa kojima se radi po posebnom planu i programu. Međutim, oni pokazuju dodatnu zainteresovanost za prirodne nauke i proširivanje znanja van okvira predviđenih nastavnim planom i programom. Cilj ovog rada bilo je ispitati mogućnost za obradu hemijskih nastavnih sadržaja primenom naučnog metoda saznavanja u VII razredu osnovne škole, u specijalnom odeljenju darovitih učenika. Takođe, cilj je bio ispitati mišljenje učenika o ovom načinu rada. Uzorak istraživanja činilo je 20 učenika specijalnog odeljenja sedmog razreda Gimnazije "Jovan Jovanović Zmaj" u Novom Sadu. Istraživanje je sprovedeno tokom maja školske 2016/2017. godine, u bloku od tri školska časa. Učenici su podeljeni u grupe, a svaka grupa dobila je zadatak da ispita uticaj jednog od faktora na brzinu hemijske reakcije. Svaka grupa učenika je osmislila i izvela planirani eksperiment, proverila svoju hipotezu i sastavila izveštaj. U završnom delu časa učenici su prodiskutovali prikazane rezultate i tumačili mehanizam uticaja pojedinih faktora na brzinu hemijske reakcije. Svi učenici su izrazili mišljenje da im je ovakav način rada mnogo zanimljiviji i više motivišući od tradicionalnog.

Ključne reči: daroviti, nastava, hemija, naučni metod saznavanja, brzina hemijske reakcije

UDC 371.3-056.45::51
Review paper

SUPPORT TO EARLY MATHEMATICAL GIFTEDNESS IN PRESCHOOL AND IN FAMILY: THE SUGGESTION OF STIMULATIVE PROGRAM

Radoje Pavlović¹, Mirjana Nikolić¹ & Radovan Grandić²

*¹College of Professional Studies for Education and Business Informatics - Sirmium,
Sremska Mitrovica, Serbia*

²Faculty of Philosophy, Novi Sad, Serbia

Abstract

The results of the study indicate that in children with early ability differentiation, mathematical giftedness can already be recognized a preschool age, usually within the family or at the preschool institution. The issue arises when parents, and often teachers, lack knowledge about the indicators of early mathematical giftedness and skills to provide additional support to these children. Therefore, the aim of this paper is to present a stimulative program originally conceived on the basis of insights into literature, processually revised through the cooperation among educators, parents and experts in the field of mathematics, and then evaluated through multiple years of monitoring of the achievements of a child gifted for mathematics that was included in the program at the age of five. The program is based on several premises: 1) that a well-developed pedagogical profile of a child is the starting point for further intervention; 2) that, in accordance with specific mathematical knowledge and skills at preschool age, it is desirable to stimulate children in the field of solving textual arithmetic tasks 3) that mathematical giftedness should be viewed holistically - as a part of the overall development of intellectual and creative abilities in the domain of convergent and divergent thinking, imagination, perception, memory, attention and language of cognition. Continuous cooperation between families and preschools, with the involvement of experts in mathematics, pedagogy and psychology, are important factors in creating, implementing and adapting programs to the characteristics of the children included in the program. Evaluation of the presented program was done on a single child, while the education of teachers and parents as well as the adequate professional literature in the form of guides that would further facilitate the application of the program at preschool institutions and within families would be a significant prerequisite for the realization and evaluation of the program on a larger number of children.

Key words: gifted children, mathematics, stimulative program, guide for educators and parents

Introduction

The issue of early identification of giftedness is mainly related to the differentiation of abilities and, consequently, to the area in which giftedness is expressed. It is known that numerical abilities, reasoning abilities etc. are differentiated quite early (Božin et al., 2003), which indicates that it is justifiable to perform an early identification of mathematical giftedness. This increases the chance that a gifted child will fully realize its potential and diminishes the risk that, due to insufficient stimulation, the child will form negative attitudes towards learning and work responsibilities and habits – and consequently the results will not be satisfactory (Kuo, Maker, Su, & Hu, 2010; Koshy et al., 2009). A large number of researchers agree that it is not easy to determine the indicators used to recognize and identify early mathematical giftedness (Borland & Wright, 1994; Kelemen, 2012; Ford, 2003, Špijunović, Kundačina, Maričić, 2013). It is easier to talk about the mathematical giftedness at an older age, when school achievements are evident and measurable. Thus, Osborne (1991, according to McHardy, 2008) distinguishes behavior typical of students who are successful in the field of mathematics:

- an appreciation of the uniqueness, existence, and universality,
- a tendency to see mathematics in the ordinary and commonplace,
- flexibility in considering alternative strategies, and
- the ability to recognize and quickly abandon unproductive processes (Osborne, 1991).

When early age is considered, we do not find a systematic studies of how three-year-olds, four-year-olds, five-year-olds develop mathematical competences. However, there are some descriptive reports about it. In a two-year study conducted on a sample of 284 pre-school-aged children advanced in mathematics, Waxman, Robinson, & Mukhopadbyay (1996) found similar characteristics as Osborne (1991), but added several other indicators:

- exceptional mathematical reasoning and memory,
- interest in mathematical symbols and written representations,
- advanced computational skills and / or problem solving ability,
- rapidity in mastering a typical grade level math curriculum,
- ability to hold problems in a mind that is still not solved,
- "number sense" used to decide if an answer is reasonable,
- frequent step-skipping and invented strategies,
- intuitive understanding and a willingness to do problems abstractly,
- long periods of absorption and pleasure in difficult problems, and
- ability to manipulate and a real joy in working with "big" numbers.

Children who are gifted in mathematics have, therefore, the developed ability to operate symbols and spatial concepts, the high ability of reasoning, generalization and separation of the form from the context, show the emphasized imagination and flexibility in thinking, the ability of sequencing logical operations etc. (Božin et al., 2003; Koshy, Ernest, & Casey, 2009; Sharma, 2013).

Bosse and Rotigel (2006) proposed a modified curriculum in the field of mathematics for gifted preschool children, were taken into account, and made the following recommendations:

- introducing additional topics,
- extending research based on student interest,
- connecting concepts from one mathematics field to another,
- demonstrating mathematical connections to children's real lives,
- exploring mathematics textbooks at many levels, and
- investigating math on the Internet.

Van Tassel-Baska (2003) suggests that significant learning outcomes in any domain should reflect the "habits of mind" used by professionals in that field. "The standard mathematics curriculum gives students standard problems. It is fine for building a repertoire of mathematical skills, but it is not enough to build the mathematical habits of mind that typically employ mathematicians. These include creativity, tenacity, skepticism, and collaboration." (p.168)

Additional Support to Mathematically Gifted Children in Pre-School Institution and Family: Research Results

Timely identification and / or identification of early mathematical giftedness are a significant prerequisite for providing additional support in this field. Parents and preschool teachers are the first people to notice the characteristics that indicate that the development of mathematical abilities in a child is above average. Nevertheless, the results of the research carried out on the population of Srem district preschool teachers - N = 212 (Nikolić, Grandić, Pavlović, 2017), as well as preschool teachers in the territory of Western Serbia - N = 210 (Maričić, Špijunović, 2014) show that more than the half of the examinees consider that they do not have enough developed competences to recognize mathematical giftedness. The authors of the research conclude that initial education does not adequately prepare preschool teachers to recognize early mathematical giftedness and point out the importance of additional professional training for preschool teachers in this field.

When it comes to additional support, the situation in pre-school institutions is even more unfavorable. Researches conducted in the territory of the Srem district (Nikolić, Cvijetić, Mijailović, 2015; Nikolić, Panić, Opsenica-Kostić, 2017) indicate that only 20% of preschool teachers stated that they are applying some of the forms of additional support in work with the gifted, to enrich the learning environment. Preschool teachers report that they are insufficiently trained to create a pedagogical profile for a gifted child and create contents within the individualization of educational work. Enrichment of the environment for the learning and development of gifted children in the field of spatial, arts, music and drama giftedness is in line with the competences developed by preschool teachers (Nikolić et al., 2017), but the creation of stimulating contents for encouraging mathematical giftedness is a problem for preschool teachers and they obviously need support. They especially have a problem working with children who show outstanding mathematical skills.

Considering that the family is a significant factor in the process of recognizing and providing additional support to gifted children (Grandić, Letić, 2009; Nikolić, Dedaj, Grandić, 2017), and that cooperation with preschool teachers and other professionals in the field of giftedness is needed so that families of different educational and financial status would be encouraged to stimulate giftedness in their children, it is clear that there is a need to conceive content / tasks (and activities) in the field of early mathematical giftedness, which would represent a good basis for preschool teachers and parents for additional working with children.

Therefore, the aim of this paper is to present a stimulating program in the field of mathematical giftedness manifested in the child from an early age, which required the creation and application of special mathematical contents and methodological procedures in providing additional support to a child in preschool institution and family.

Premises for Creating a Program

In defining the contents of the stimulating program and the approach to realization, it has been taken into account that:

- 1) A well-developed pedagogical profile of a child is the starting point for further intervention
- 2) Children who demonstrate mathematical giftedness have the ability to understand the principle of constructing natural numbers early enough, so it is desirable to encourage solving textual arithmetic tasks in relation to specific mathematical knowledge and skills at preschool age (Utepkaliev, 1998).
- 3) Mathematical giftedness should be considered holistically - as part of the overall development of intellectual and creative abilities in the domain of convergent and divergent thinking, imagination, perception, memory, attention, language and knowledge (Savenkov, 2000).

Structure and content of the program

The program was conceptualized when the child went to preschool, at the age of five, it was revised (new elements were introduced, in accordance with the needs in the zone of proximal development of the child), and evaluated after a one-year implementation. The curriculum was created by a professor of mathematics, a psychology professor (from the role of expert and parent), a pedagogy teacher (as an external associate), and a preschool teacher.

Pedagogical Profile - the Starting Point for Further Intervention

In the process of creating a pedagogical profile, data from parents were collected (through interviews), anecdotal notes which mother made

from the early age of the child, and the preschool teacher conducted a systematic observation of the child through the observation protocols and the checklists, as well as phenomenological observation (narrative and anecdotal notes).

Excerpt from pedagogical profile

Child's strengths

Cognitive development: The child is highly interested in different areas: language (he has been reading fluently and with understanding from the age of five) mathematics, computers, music (he has been playing piano since he was four), foreign language; especially the ability of logical thinking, linking causes and consequences, arithmetic thinking, the ability to perceive rules, and make generalizations based on the observed principles; child at home, with the help of parents and independently acquires new knowledge in various fields of natural and social sciences, using ICT, encyclopedias, textbooks. The child has a remarkable ability to memorise (when he was two he could repeat the entire content of the book of about ten pages only after two or three readings by heart), ability to memorise songs as well as any other content; the ability to talk about events in the order in which they happened, with a variety of details. A child can tell the time using the clock, understand the term hour / minute / second. He has extraordinary attention and concentration, can be devoted to certain activities, persistently and over a longer period of time. General cognitive development is accelerated and specifically, in the field of mathematics, the following items stand out:

- Early adoption of the notion of number (first-ten numbers learned at the age of 2, then, very quickly numbers up to 100) and the principle of building natural numbers line at the age before the fourth year (the number preceding or following);
- A tendency to "see" mathematics in ordinary things around himself (at the age of two and a half he could say: "Close the window at one, it is cold" or "Marko is on the swing number 2");
- Early mastering the concept of geometric shapes, and their recognizing in a real environment, as well as spatial relationships (the left and right hand / side identified at the age of two
- Early adoption of the concepts of time relations (after-before, yesterday-today-tomorrow, etc.) and time intervals (seconds, minutes, hours, day ...) and their interrelations.
- Outstanding mathematical reasoning and memory (memorizing at the age of 3 6-digit phone numbers), advanced computer skills and / or ability to solve problems (independently uses computer programs: Word, Excel, starting from the age of 4 – insert data in an excel table, writes short texts), can store more data in the operational memory and manipulate "big" numbers (at the age of four and a half solves the task of the type: "Grandmother baked 55 pancakes, Teodora ate 8, Srećko 6, how many pancakes are there for Jovan").

Mathematical knowledge at an early age was acquired with the support of parents and computer games such as: Mućni glavom, English for kids etc.

Speech and communication

He speaks fluently and accurately, he is not too fluent, but the sentences are informative, clear, semantically and syntactically correct. He has adopted and processed all the linguistic contents easily, from the early age (four years) he had phonologic awareness, he was reading at the age of five (he reads Latin and Cyrillic fluently and with understanding), at an early age he started to spontaneously acquire the English language (with the help of computer games), he knew the alphabet at the age of 3 and he could read and translate sentences in English at the age of 5; he wants to be explained the grammatical rules of the English language; often compares the principles of word building in Serbian and English, perceives rules similarities and differences.

Other aspects of development

Socio-emotional development: The child quickly adopts the rules and consistently adheres to them. There is a need to socialize with peers, but in a structured situation (in activities in a preschool institution, in games that are "lead" by adults - parents and / or preschool teacher). He shows lower performance in free game, especially if the peers do not respect the rules. He does not show a desire to be a leader, nor does he have socio-emotional competencies for it. In emotional development, he is mature for his calendar age, but there are situations when there is a disharmony between intellectual and emotional development: when, for example, he could not tie his shoes at the age of two and wanted to do it on his own, there were outbursts of anger, (throwing himself on the floor, etc) ... Later (at the age of four and five) the outbursts of the anger were present, but they were expressed in a more socially acceptable way; he does not tolerate failure, reacts very fiercely (mainly angrily) if something does not go smoothly, as he has imagined; he has a strong motivation for achievement, persistence, dedication and autonomy in work, as well as a tendency towards perfectionism. When not frustrated with his own desires and goals, he is mostly cheerful and with balanced emotions.

Independence and self-care: He is independent in fulfilling his obligations in preschool institution and at home. He only asks for help in situations when he is studying new contents for which he needs additional clarifications or guidelines. All obligations entrusted to him as part of his autonomy and care of himself are carried out, but he does not show the initiative to develop independently in that direction (he rather rely on parents' instructions).

Motor development: The gross motor development corresponds with the child's age, while in the case of fine motor development it is necessary to improve certain skills; the child is gladly involved in motor activities, is interested, but not sufficiently competent, especially in collective ball

games; in individual activities, where instruction is followed and which require attention and concentration he is considerably better (he is training aikido); he swims very well (from his fourth) and rides a bike;

Need for support:

In the field of socio-emotional relations, one must work to overcome the emotion of anger, as well as the perfectionism that is present in several spheres of child's functioning. It is desirable to delegate to the child more obligations in order to gain self-confidence in the area of self-reliance and self-care: to take care of toys, worksheets, buy snacks, etc. It is also important to work on improving fine motor development and accepting his role in collective sports activities.

Priority additional support area: mathematics

Although the current Law on the Foundations of the Education System ("Official Gazette of the Republic of Serbia", No. 88/2017) recognizes the measures of individualization, but not the individual educational plan (IOP) as a kind of additional support at pre-school age, the current level of cognitive development of the child, and the specific development of mathematical abilities required the structuring of the program with altered mathematics content (the learning outcomes stipulated by foundations of the pre-school program were largely overcome), so it was necessary, apart from preschool teacher and parents, to include an expert in mathematics (with experience in working with gifted children of early elementary school age) and an educator (with an academic focus on the study of gifted behavior) into the conception (and occasionally the realization) of a program that will stimulate the whole development of the child, with an emphasis on the development of mathematical abilities. Another reason for providing support in other domains of development is the extraordinary abilities of the child, both in the field of language development and musical abilities.

Solving Textual Arithmetic Tasks

The task is a text containing numerical components. The structure of the text is such that it can separate the condition and the request, which does not have to be in the form of a question. In order to successfully solve tasks, the child should be able to:

- a) read well and understand the meaning of the text;
- b) reveal its structure and the interconnections between given and requested data;
- c) properly select and use arithmetic operations.

The essence of a modern developmental methodological approach to child training in task solving is to enable the child to become independent in order to create a problem-solving plan. In other words, it is not a goal for a child to learn to solve a certain set of type tasks, but to learn to solve any tasks, and to do so ***independently***. So, in order for the child to solve the task, it must understand the meaning of texts of different structures, correctly present the situation, choose an arithmetic operation

in accordance with the situation, compile a mathematical expression in accordance with the selected operation, and be able to add and subtract well (Pavlović, 2015).

Taking into account the characteristics of the child for whom the program is intended (it reads fluently and with understanding, adds and subtracts one-digit numbers up to 100), the recommended contents were based on the independent solution of the so-called untypical tasks in which the claim is expressed in a statement, or the whole task is given in one sentence, or the condition is divided into two parts. For example:

In the yard there were 26 cars and 8 trucks. Tell the number of the vehicles in the yard.

How many candies did Miljana have if she kept 15 candies for her, and she gave 7 candies to her brother?

There were 47 books on the shelf. How many books remained on the shelf when Milos took 8 books to the library and Grandma took away 5 books in the drawer?

Untypical texts can also be constructed on other principles. For example, there are texts with *insufficient* or *extra* information.

Birds sit on the wire. 12 birds are sparrows, and the other birds are pigeons. How many pigeons are there?

There are 15 cakes on the plate. Veljko ate 4 cakes and Vanja ate 7. How many cakes did the two eat?

It is also useful to direct the child to observe "strangeness" in the texts of the task. For this, texts that resemble tasks, texts with various inconsistencies, etc. can be used. e.g:

The sparrows and pigeons were sitting by the window. Three sparrows flew away. How many pigeons left by the window? (There is no answer. It's not clear how many birds were at the beginning by the window.)

Six girls were sitting on two benches. 8 girls sat on one bench. How many girls were sitting on the second bench? (Such conditions are impossible. There could not be fewer girls on two benches than on the one)

We put 4 tomatoes and 5 cucumbers on the plate. How many cucumbers did we put on the plate? (Something that is already known).

In the next stage, one may ask the child to independently think of tasks that are analogous to the types of tasks presented, try to ask the peers in the group and / or in the family (parents, older siblings) to solve them. Also, computer skills and early literacy allow setting the goal for the child to write off the tasks he has designed independently, make a presentation for the group, etc.

After the child adopted the principles that were demonstrated through the aforementioned tasks, it was recommended that from the available literature for preschool and early school age (it is estimated that the child can adopt mathematical contents that are 2-3 years above the calendar age) performs a selection of textual tasks which will be done during the period of realization of the program. (selection of tasks according to: Kalinina, Kac, Tilipman, 2013).

A Holistic Approach to Encouraging Mathematical Giftedness

Besides encouraging in the field of solving textual arithmetic tasks, the contents of the program are also based on the assumption that mathematical giftedness should be observed holistically, the child's development should be encouraged in different areas, while the contents of these activities are directly and indirectly linked to the development of mathematical thinking. The structure of this approach resembles a logarithmic spiral - one form of thought is processed several times, periodically, and each activity is a reflection of the creative activity of the one who creates and realizes it (preschool teacher, educator, parent ...), and adapts to the developmental characteristics of the child / children with whom it is done. There are several ways of doing tasks - performing a special task, i.e. the task can be directed to the development of mathematical thinking, then to the development of creative and intellectual abilities, or to the complex development of all aspects of thinking within the task.

Examples of some tasks / activities from parts of the program that encouraged the development of the child in the domain of convergent and divergent thinking, imagination, perception, memory, attention and language of knowledge are given.

Convergent thinking is a logically connected one-way thinking. It occurs and develops in tasks that have one correct answer, and the answer can be logically derived from the conditions itself. Such tasks have a strictly defined structure, their solution is achieved through the use of certain rules - algorithms and requires argumentation, regardless of the child's ability to respond quickly to a given task. This requirement is explained by the fact that on easier examples children learn models of correct reasoning. This acquired skill is used when solving more difficult problems. It is advisable and useful to ask the child to give an explanation that would be understandable to other children.

Example 1 Aca's suitcase can fit into a Boban's suitcase, and Vasa's suitcase can fit into the Aca's case. Which of these suitcases is the biggest (smallest)?

It is a characteristic task of the properties of an object. The size of the object is communicated indirectly - through the fact that one suitcase can fit in the other. It is also important to discuss the fact that these characteristics are not equivalent, once the task has been solved: if the suitcase A can not fit into suitcase B, this does not mean that the case A is bigger than the suitcase B (Figure 1). Conversely, if suitcase A can fit into suitcase B, then suitcase B is larger than suitcase A.

Figure 1

A clear solution should be obtained in three steps in the form of argument that the child orally explains:

- since Aca's suitcase can fit into Boban's suitcase, Boban's suitcase is bigger than Aca's suitcase (Aca's suitcase is smaller than Boban's suitcase);
- since Vasa's suitcase can fit into Aca's suitcase, Aca's suitcase is bigger than Vasa's suitcase (Vasa's suitcase is smaller than Aca's suitcase);

- since Boban's suitcase is bigger than Aca's suitcase, and Aca's suitcase is bigger than Vasa's, Boban's suitcase is the biggest
 Finally, it is required that the child schematically shows the steps in solving the task and presents it to other children (and / or adults)
 Boban's
 Aca's
 Vasa's

Figure 2

It is important to ask the child to represent in circles, rectangles or lines objects that are known to be bigger than others or are equal to one another.

Example 2 The human body temperature is lower than the body temperature of the pigeon but it is higher than the temperature of the elephant. For whom of them will the thermometer show the lowest temperature?

Example 3 If we pull a harder object into a less hard (soft) object, a trace in the form of a scratch will remain. Does it remain scratched if we pull the glass through the cardboard? And if we pull the cardboard on the glass?

Divergent thinking deviates from classical logic. A divergent task is such a task that assumes that there may be a few or a lot of correct answers to the single question. When solving such tasks, skills such as originality, flexibility, and speed of thought, association skills, exceptional sensitivity to problems and others are developed.

Example 1 Different geometric figures are given. Task: Make up from the given figures as many things as possible (home, tree, dog). Then the task is complicated. Make a residential building, a shop, a cinema, a castle, etc.

Example 2 Think of more traditional and unusual ways of using wood.

Example Cross the odd one out: Oyster, dolphin, bat, dog. (multiple solutions to the task are correct depending on the criteria: for example, "Dolphin" because it is the only sea animal, or "Dog" because it is the only domestic animal).

Example 4 For a passage from a story, fairytale, or any other piece of literature, make as many titles as possible.

In the field of mathematics, the following tasks can be conceived:

Example 1 Three children played in the yard: Marko, Milan and Ana. In total, they had less than 20 marbles. Ana had one more than Marko. Marko had 5 marbles. How many marbles did Milan have?

A child needs to realize that the task has more accurate solutions.

Example 2 The Jovanovic family has five children. 3 children like to eat pancakes with cream, and 4 children like pancakes with cheese. How many kids like to eat pancakes of both types?

Imagination is viewed as a psychological process of creating characters, objects, situations, by combining the elements of past experience. Developed tasks should be focused on the formation and development of both reproductive and creative imagination.

Example 1 Meaningfully joining parts of different animals, try to make a living being with new unusual features. And then describe (or draw) such a being.

Drawing on the characteristics of the child for whom the program was created, children's extraordinary musical abilities and knowledge of the notes were used, and the following instruction was added in the second part: *Present the creature with unusual features from the previous task by notes. After that, introduce it to your friends by playing notes on the piano.*

Perception is a reflection of the object and phenomenon in the immediate action on the sensory organs. Perception is closely related to thought and attention. Tasks should be oriented towards the formation and development of all its forms: object perception, movement perception, space perception, perception of time, perception of people and relationships.

Example 1 Take a sheet of paper in squares and a pencil. In addition to the dictation, you need to draw a shape: one square to the right - one - up, one - left, one - bottom, 4 squares right, 4 - up, one left, one - down, one - left, one down, one left, one down, one left, one down; 5 squares above, 5 - right, 4 - down, 3 - left, 2 - up, 2 - right, 1 - down.

Example 2 Determine what is good in the given events and what is bad: It rains; Rose has got thorns, Driving in a boat; A strong wind is blowing; The road is slippery.

The task basically has the ability to perceive events, relationships, but it can also be understood as a task in the field of divergent thinking.

When developing tasks from the field of *memory* as a starting point, it was accepted that the development of the ability to preserve the previous experience is one of the most important tasks of intellectual and creative development. Characteristic examples of these tasks were:

Example 1 Several names are spoken, of which certain names (male or female) begin with the same sound: Milica, Milan, Aleksa, Jovan, Gordana, Jovanka, Ana; The task is for the child to try to name as many names as he can remember. Larger memory contributes to grouping terms (in this case name) by common characteristics.

Example 2 A series of numbers is shown. They should be remembered in this order: 2, 3, 5, 7, 3, 5, 7. The child should repeat the numbers and say the way in which he has memorized them. It starts from the assumption that a child will recognize the method of grouping numbers.

Attention is a psychological phenomenon that characterizes the focus of the subject's activity at a given moment in a real or ideal object. Characteristic tasks for acceleration of attention would be:

Example 1

Km NrpS jLVsn VkJM kmB JlvSsN NRPS VKJM

Task: Try first and without mistake to count the capital letters, then the small ones, and then remember them.

Example 2

Three neighbours arrived at two rabbits at lunch time.

In the garden, the rabbits sat and ate three carrots.

Task: Try to count how many carrots have been eaten.

The language of knowledge unifies tasks that are directed towards the formation and development of the child's cognitive sphere. Tasks are focused on forming the skill to gather information, to conduct self-exploration, to compare, to estimate, to give properties to objects, to formulate the statements and to draw conclusions.

Example 1 Make a crossword based on what you know about fairy tales' characters

Example 2 Say in a different way: "Tomorrow the weather will be nice," "The speed of a racing car depends on the driver's mastery."

Example 3 Determine if these two sentences describe the same or different event:

Before he went out to play, Milan did the task; Milan went out to play and then he did the task;

Mum had made a lunch and then she went to the neighbour; Mum went to the neighbour after she had made lunch.

Only some of the examples used in the program are listed. Since the child has been using computer since an early age and is interested in learning English, the stimulation within these domains is individually and complexly, as well as the mathematical thinking itself, done applying various computer games such as: Kindergarten math (internet <http://www.ixl.com/math/kindergarten>), the website of [dobreigre.com](http://www.dobreigre.com), (at <http://www.dobreigre.com/>).

Realization and Evaluation of the Program

The presented program was realized for a year, until the child entered the preparatory preschool group. It implied the realization of these activities in the educational group (two to three times weekly) and in the family. Continuous cooperation between preschool teachers, parents, experts in the field of mathematics and pedagogy has been realized, which implied a joint consideration of the contents to be realized, taking care to encourage the development of the child, but also that the child is not frustrated by high demands in the intellectual, and especially the socio-emotional sphere. There were situations in which the child, based on the offered materials, compiled tasks and problems that exceeded the defined goals, so the planned contents of the program had to be modified and made more complex. Cooperation and communication between preschool teacher, parents, experts in the field of mathematics and pedagogy was conducted directly and through e-mail correspondence. The integration of a stimulating program in the field of mathematics into the work plan of the group was achieved through learning in asymmetric interaction, where a gifted child, working with other children in pairs, and / or in small groups, encouraged peers in the zone of proximal development (Vigotsky, 1996). The reciprocal teaching form has been used in several learning situations - a gifted child was in the role of the one who taught others (Krnjaja, 2009). In this way, a gifted child has developed his metacognitive skills, but also self-confidence and responsibility.

At the end of the program realization, the child achieved the expected learning outcomes in the field of mathematics, as well as in the overall development of intellectual and creative thinking. Based on the interviews conducted with the preschool teacher, parents and engaged experts at the end of the program it could be concluded that the preschool teacher had support in the creation and realization of the contents, as well as the parents, and the engaged experts, through the implementation of theoretical knowledge in practical work with the child gifted in mathematics have also enhanced their competencies in the field of giftedness at an early age.

For further work (during preparatory preschool program), it is planned to continue stimulation in accordance with the holistic approach, and in the field of mathematics to apply the processing of mathematical contents, whereas horizontal expansion would be applied to measuring and measurements, combinatorial logic, counting of elements in a set, difficult situations and combinatorial geometry, and to use content from various websites (for example: <http://www.arcademics.com/http://www.coolmathgames.com/?https://www.google.rs/search?q=DMS+KENGUR+BEZ+BORDER&oq=dms+kengur+no+border&aqs=chrome.0.69i59j0l3.5948j0j7&sourceid=chrome&ie=UTF-8>), where tasks for the age of 7, and 9 years would be chosen.

During the preparatory preschool program, during the testing of the child for enrollment in school, the testing of intellectual abilities was performed by the Revisk (Biro, 1998) test and it was found that the abilities of the child are in 1% of the population both on a verbal and manipulative scale. After the individualization measures in the 1st grade on the proposal of the teacher, the individual educational plan for mathematics was implemented (Nikolić, Pavlović, Subotić, 2016). By the end of the 6th grade (which is child currently attending), the child won several prizes at the district and republic competitions in mathematics, and at the national competition in physics and informatics. He participated in the European Championship of Traffic and won several domestic and international piano competitions.

Conclusion

Recognizing early mathematical giftedness and especially the stimulation of children who show a prominent gift for mathematics from an early age can be a challenge for preschool teachers and parents. A particularly difficult task is the choice of content that will stimulate the development of high abilities and the way of their realization. The paper presents an example of a stimulating program in the field of mathematical giftedness for the age of 5-6, which was developed in accordance with the characteristics of the child's development in the field of mathematics, having taken into account other aspects of the intellectual and socio-emotional development of the child. Based on the presented program, it can be concluded that encouraging early mathematical giftedness, at least for children with outstanding abilities in this field, requires the engagement

of other professionals (outside preschools institution and family) who can provide additional support to preschool teachers and parents in creating, implementing and evaluating the program. The initial step in creating each program for a gifted child should, without a doubt, be a well-developed pedagogical profile of a child. If a preschool teacher does not have enough developed competencies for it, it is advisable to involve other experts in making the pedagogical profile (in this example, the parent / psychology professor participated, together with the preschool teacher in the development of the pedagogical profile). Looking at the overall development of the child, and not just the domain in which the giftedness is presented, is also a significant recommendation when it comes to mathematical giftedness but also in all other areas in which giftedness can be manifested. In the concrete case, the child showed (and shows) extraordinary abilities in other areas (language, music), so it was important to connect all areas and to transfer knowledge and skills from one area to another. The program is structured for one child, but it can serve as an illustration of how to encourage early mathematical giftedness in preschool institution and family. If preschool teachers and parents were more educated in this field, and if there were systematized literature in the form of guidelines, with examples of tasks, it would be more certain that similar programs, adapted to the individual characteristics of mathematically gifted children, could be carried out at a wider population of preschool children.

References

- Božin, A. i sar. (2003). *Daroviti i šta sa njima-praktikum*. Vršac, RS: Viša škola za obrazovanje vaspitača.
- Bender, W.N. (2005). *Differentiating math instruction: Strategies that work for K-8 classrooms*. Thousand Oaks, CA: Corwin Press.
- Biro, M. (1998). *Priručnik za REVISK* (II revidirano i dopunjeno izdanje). Beograd, RS: Društvo psihologa Srbije.
- Borland, J. H., & Wright, L. (1994). Identifying young, potentially gifted, economically disadvantaged students. *Gifted Child Quarterly*, 38, 164–171.
- Bosse, M. J., & Rotigel, J. V. (2006). *Encouraging your child's math talent: The involved parents' guide*. Waco, TX: Prufrock Press.
- Callahan, C. M., & Miller, E. M. (2005). A child-responsive model of giftedness. In R. J. Sternberg (Ed.), *Conceptions of giftedness* (2nd ed., 38–51). New York: Cambridge University Press.
- Dai, D. Y., & Renzulli, J. S. (2008). Snowflakes, living systems, and the mystery of giftedness. *Gifted Child Quarterly*, 52(2), 114-130.
- Ford, D.Y. (2003). Two wrongs don't make a right: Sacrificing the needs of diverse students does not solve gifted education's unresolved problems. *Journal for the Education of the Gifted*, 26(4), 283–291.
- Grandić, R., & Letić, M. (2009). *Roditelji i nastavnici o darovitoj deci i mladima*. Novi Sad, RS: Savez pedagoških društava Vojvodine.
- Grandić, R. Letić, M. (2012). Mišljenje roditelja o darovitoj deci i njihovom adekvatnom obrazovanju i vaspitanju, *Pedagogija*, vol. 67, br. 3, str. 362-375.
- Калинина А.Б., Кац Е.М., Тилипман А. М., (2013). *Математика в твоих руках*, Вако, Москва.
- Kuo, C. C., Maker, J., Su, F. L., & Hu, C. (2010). Identifying young gifted children and cultivating problem solving abilities and multiple intelligences. *Learning and Individual Differences*, 20(4), 365-379.

- Kelemen, G. (2012). Identification of highly gifted children. *Educação/ formação, exedra*, 6, 43-55.
- Koshy, V., Ernest, P., & Casey, R. (2009). Mathematically gifted and talented learners: theory and practice. *International Journal of Mathematical Education in Science & Technology*, 40(2), 213-228.
- Krnjaja, Ž. (2009). *Kontekst u učenju i podučavanju*, Beograd: Zadužbina Andrejević.
- Maričić, S., Špijunović, K. (2014). Samopercepcija osposobljenosti vaspitača za prepoznavanje dece potencijalno darovite za matematiku, *Godišnjak Učiteljskog fakulteta u Vranju*, knjiga V, 73-85.
- McHardy, R. (2008). *Building worthwhile mathematics programs, for preschool gifted children*, Paper presented at the 11th International Congress on Mathematical Education, Math for gifted preschoolers (pp. 1-21), Mexico: Universidad Autonoma de Nuevo Leon Monterrey.
- Nikolić, M., Cvijetić, M., Mijailović, G. (2015). Razvijanje kompetencija vaspitača za rad sa darovitom decom, *Metodički dani, Kompetencije vaspitača za društvo znanja, Knjiga rezimea*, 127-128.
- Nikolić, M., Subotić, S., Pavlović, R. (2016). Individualni obrazovni plan za darovito dete iz oblasti matematike, *Pedagoška stvarnost*, 62 (1), 79-98.
- Nikolić, M., Grandić, R., Dedaj, M. (2017). Predstave roditelja o darovitosti na predškolskom uzrastu, U: Avdić, A., Junuzović-Žunić, L. (ur.) *Unapređenje kvaliteta života djece i mladih, Tematski Zbornik radova* (131-143). Tuzla: Udruženje za podršku i kreativni razvoj djece i mladih, Edukacijsko-rehabilitacijski fakultet Univerziteta u Tuzli.
- Nikolić, M., Panić, T., Opsenica-Kostić, J. (2017). Mišljenje vaspitača o darovitosti na predškolskom uzrastu, *Vaspitanje i obrazovanje*, XLII, 1-2, 99-109.
- Nikolić, M., Grandić, R., Pavlović, M. (2017). Kompetencije vaspitača za rad sa darovitom decom, *Inovacije u nastavi*, br.1, vol 30, 43-55.
- Pavlović, R. (2015). *Metodički pristup u rešavanju tekstualnih aritmetičkih zadataka u radu sa darovitom decom predškolskog uzrasta*. Rad prezentovan na VI međunarodnoj naučnoj konferenciji „Inkluzija u predškolskoj ustanovi i osnovnoj školi“, Institut za pedagoška istraživanja i Visoka škola strukovnih studija za vaspitače i poslovne informatičare-Sirmijum, Sremska Mitrovica, Republika Srbija.
- Савенков А.И., (2000). *Одаренные дети в детском саду и школе*, Академи, Москва.
- Sharma, Y. (2013). Mathematical giftedness a creative scenario. *Australian Mathematics Teacher*, 69(1), 15-24.
- Špijunović, K., Kundačina, M., Maričić, S. (2013). Metodološki problemi proučavanja darovitosti za matematiku, u G. Gojkov, A. Stojanović (ur): „Metodološki problemi istraživanja darovitosti— (382-388). Vršac: Visoka škola strukovnih studija za obrazovanje vaspitača „Mihailo Palov—, Arad: Universitatea de Vest „Aurel Vlaicu—.
- Утепкилиев С. (1998). *Методика обучения младших школьников самостоятельному решению текстовых задач по математике*, Атырау.
- VanTassel-Baska, J. (Ed.). (2006). *Serving Gifted Learners beyond the Traditional Classroom: A Guide to Alternative Programs and Services*. Austin, TX: Prufrock Press.
- Vigotski, L.S. (1996). *Mišljenje i govor*, Beograd: Nolit.
- Waxman, B., Robinson, N. M., & Mukhopadbyay, S. (1996). *Teachers nurturing math-talented young children*. Storrs, CT: National Research Center on the Gifted and Talented.
- Zakon o osnovama sistema obrazovanja i vaspitanja ("Sl. glasnik RS", br. 88/2017).*

PODRŠKA RANOJ MATEMATIČKOJ DAROVITOSTI U PREDŠKOLSKOJ USTANOVI I PORODICI: PREDLOG STIMULATIVNOG PROGRAMA

Radoje Paulović¹, Mirjana Nikolić¹ i Radovan Grandić²

*¹Visoka škola strukovnih studija za vaspitače i poslovne informatičare – Sirmijum,
Sremska Mitrovica, Srbija*

²Filozofski fakultet, Novi Sad, Srbija

Apstrakt

Rezultati istraživanja ukazuju da se kod dece kod koje je došlo do rane diferencijacije sposobnosti matematička darovitost može prepoznati već na predškolskom uzrastu i to najpre u porodici i predškolskoj ustanovi. Problem je što roditeljima, a često i vaspitačima nedostaju znanja i veštine o indikatorima rane matematičke darovitosti, i načinima pružanja dodatne podrške ovoj deci. Zbog toga je cilj ovog rada da prikaže jedan stimulativni program, koji je preliminarno koncipiran na osnovu uvida u literaturu, procesno revidiran kroz saradnju vaspitača, roditelja i stručnjaka iz oblasti matematike, a zatim evaluiran kroz višegodišnje praćenje postignuća deteta darovitog u oblasti matematike koje je uključeno u program na uzrastu od pet godina. Program se zasniva na više postavki: 1) da je dobro izrađen pedagoški profil deteta polazna osnova za dalju intervenciju 2) da je, u skladu sa specifičnim matematičkim znanjima i veštinama na predškolskom uzrastu poželjno vršiti stimulaciju dece u području rešavanja tekstualnih aritmetičkih zadataka 3) da matematičku darovitost treba posmatrati holistički - u sklopu sveukupnog razvoja intelektualnih i stvaralačkih sposobnosti u domenu konvergentnog i divergentnog mišljenja, mašte, percepcije, pamćenja, pažnje i jezika saznanja. Kontinuirana saradnja porodice i predškolske ustanove, uz uključivanje stručnjaka iz oblasti matematike, pedagoga i psihologa predstavljaju značajne faktore u kreiranju, realizaciji i prilagođavanju programa karakteristikama dece sa kojom se radi. Evaluacija prikazanog programa vršena je na jednom detetu, a značajan preduslov za realizaciju i evaluaciju programa na većem broju dece je edukacija vaspitača i roditelja i adekvatna stručna literatura u formi vodiča koja bi dodatno olakšala primenu programa u predškolskoj ustanovi i porodici.

Ključne reči: darovita deca, matematika, stimulativni program, vodič za vaspitače i roditelje

PROFESSIONAL PAPERS

UDC 159.964.2
159.923.2

EGOGRAM IN HIGHLY OVER-INTELLIGENT PEOPLE

Marija Lazarević¹, Boris Teodosijević² & Petar Stojiljković³

¹Dom zdravlja „dr Milenko Marin“Loznica Srbija

²Subotica, Srbija

³Ministarstvo finansija, Beograd, Srbija

Abstract

Introduction: Erik Bern defined the ego state as a permanent form of feelings and experiences that is directly related with corresponding permanent pattern of behavior. In the communication model of the ego state in the Transaction Analysis, the ideal diagram contains five ego states that are desirable: Positive Criticizing Parent, Positive Nurturing, Parent, Adult, Positive Free Child, and Positively Adapted Child.

The aim of the work is to egogram of highly above average intelligent persons, in order to direct the ways and improve the quality of their communication.

Method: The study was conducted on a group of 153 respondents from members of Mensa Serbia. Ego test subjects were tested using the Ego Condition Assessment Questionnaire in Transaction Analysis by comparing the respondents' responses to the degree of agreement (I agree - I do not agree).

Results: The study found that the dominant ego state of the Adult is most represented (29.97%), while the other ego states are less represented. By observing the answers with which the respondents least agree, the greatest disagreement with the answers from the Adapted Child was noted (43.36%).

Conclusion: In this study, it can be seen that the respondents have a set of measures to use Adaptable Child behavior, or a smaller amount of time during which Adaptable Child behavior is manifested. The expression of autonomous morality with the prevalence of justice in relation to obedience could be one of the interesting topics for future research.

Key words: intelligence, ego state, transaction analysis, egogram

Introduction

In order to understand the internal psychological events in the transaction analysis, we use the ego state model created by Erik Bern, the founder of the transactional analysis (Fornaro, 2016). Erik Bern defined the ego state as a permanent form of feeling and experience that is directly related to the corresponding permanent pattern of behavior. In the communication model of the ego state in the Transaction Analysis,

the ideal diagram contains the five ego states that are desirable: Parent, Adult and Child. Thinking, feeling and behaving can be opposed to ego state. In the Parent ego state, we incorporate our parents, and we use this pattern of behavior for future events. In the state of the Child, a person behaves, thinks and feels like when he was really a child, while Adult ego state is when a person behaves, thinks and feels as how the real situation happens in its environment, using the capacities of his adult being in the present. In stressful situations it happens that we go back to the past, or move from the Adult to the Parent and the Child. (Janković, Bagić, & Krišto, 2014; Janković, Laklija, 2011).

In interpersonal communication, the ego state that a person manifests when sending messages to another person in the field of communication is very important, both at the social and psychological level (Car Brajovid, 2011; Ertem, & Kececi, 2016). Accordingly, that person can communicate with simple and complex transactions. Complex transactions are divided into angles and double. At the social level, a person can send a message and at the psychological level it is the same or quite the opposite of the previous one. Also, messages may be psychologically indirectly addressed to other people in the communication field, although they are not related to them at the social level. Communication skill is of paramount importance for the personal and professional success of an individual in the modern world, regardless of the intellectual potentials it possesses (Stewart, & Joines, 2011). How much of the underdeveloped communication skills of intelligent people influence the fact that they remain on the margins of human society is a question for some future research.

Regardless of the coefficient of intelligence, without analysis and expert opinion, we can not know the exact intelligence of us and our interlocutors. This intelligent person can lead to different situations and problems in communicating with others. Misunderstanding a message sent from an Adult ego state may be interpreted as uncooperative, opposing or refusing. The category of subjects surveyed in this study makes up only two percent of the total population misunderstandings in the various forms of communication they encounter are subject to correction by psychological trainings that develop social skills.

The Objective

The objective of the study is the manifestation of ego state of highly over-intelligent people, in order to direct the ways and improve the quality of their communication in a professional sense. By analyzing the business-like and professional success of Mensa's members, we find people with different profiles who are successful in the fields of their work, but also people who are practically professionally disoriented, they have incomplete formal and non-formal education and their abilities and talents are not perceived in direct, verbal and non-verbal communication. Effectiveness as the ability of producing the desired Mensa members' results is different (Blagojević, 2015). Effective communication is essential for successful business, and if a person encounters obstacles in this communication, the

desired results are missing. Communication is successful only if both the sender and the recipient understand the message in the same way. There may be lack of research on the communication of persons of different intelligences who have the same information, where one person can more slowly understand the information that another intelligent person can interpret in different ways. On the contrary, intelligent people can be in the business hierarchy at a lower level of the business ladder than the less intelligent ones, and receive professional tasks that they themselves can solve in a more adequate way than the one that creates an internal conflict that can be externally created in a professional environment. In these examples, highly intelligent people might use ego states that do not lead to successful business activity, but initiated by emotions can act inadequately in a professional sense. The aim of this paper is to detect inadequate ego states that need to be corrected and thus achieve better efficiency of highly intelligent persons in a professional sense.

The Method

The study was conducted with a group of 153 respondents of Mensa Serbia. The members of Mensa Serbia are those who achieved the result of intelligence tests expressed in the IQ at 131 or more according to the Wechsler scale, 133 or more according to the Binet-Simone scale, and 148 or more according to the Cattell scale, which places them in 2% of the total population in the sense of intelligence. The research was preceded by its approval by the Mensa Serbian Presidency. After receiving the approval, an electronic questionnaire form was sent to the presidency, and the Presidency then forwarded it (with instructions and basic information on the research objective), to a mailing list to all members of Mensa Serbia, who independently decided whether to participate in the research which could possibly influence the representativeness of the sample. The instrument which is used is the Questionnaire of behavioral manifestations of ego states. This questionnaire, as a measure of five functional ego states, is characterized by high reliability, despite the fact that the development of the instrument for measuring heterogeneous structures is a very difficult task which must be clearly defined in order not to be self-determining (Kuijt, 1978).

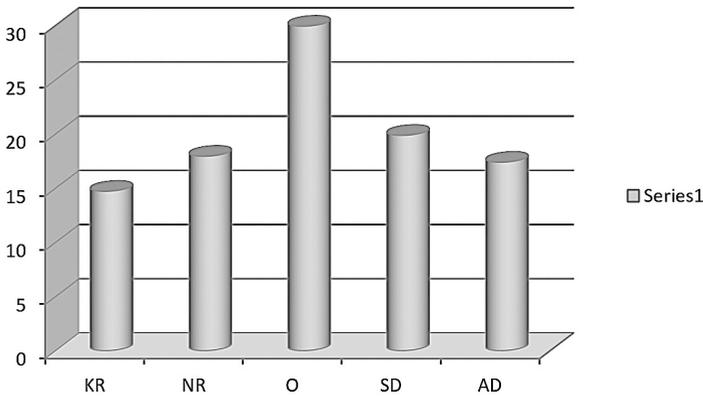
Results

Respondents' responses obtained by completing the Questionnaire for assessing the ego state in the Transaction Analysis were presented and viewed in graphic form i.e. in the form of Egogram. Egogram is a diagram showing how each of the functional parts of the ego state is represented in a person's behavior. The horizontal line of the Egogram is divided into five parts and in each part is given one of the five names for the main functional parts of the ego state. For marking the used initial letters of the ego state which is normally used in transactional analysis when it comes

to ego states: Criticizing parent (CP), Nourishing Parent (NP), Adults (A) Free Child (FC) and Adapted Child (AC). The vertical column above each mark represents the time spent in that Ego state (Clarkson, 2013).

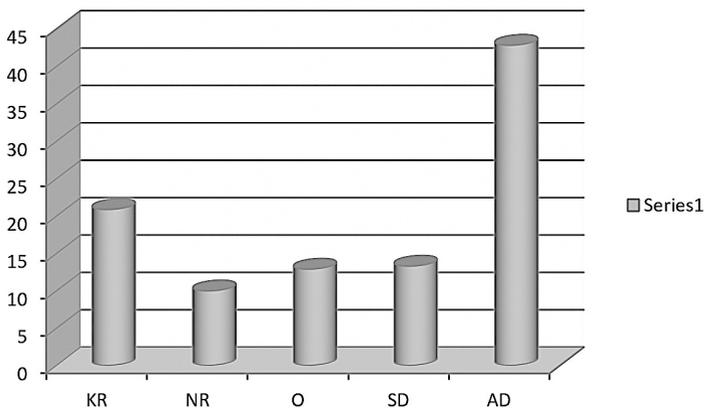
The study found that the dominant ego state of the Adult is most represented (29.97%), while the other ego states are less represented.

Grafikon 1. Odgovori sa kojima se ispitanici najviše slažu
Graph 1. Answers respondents most agree



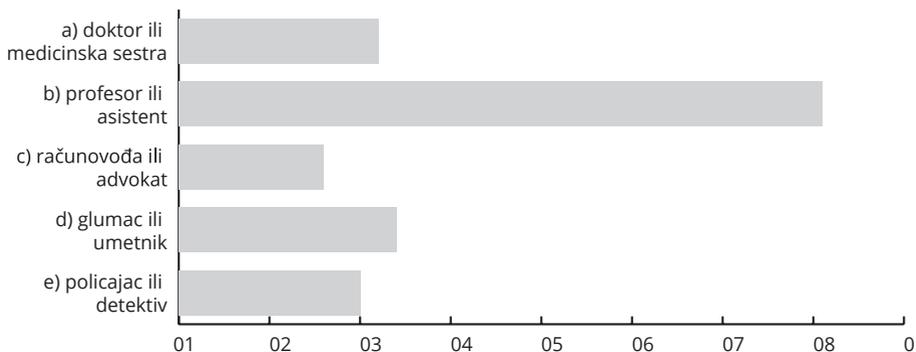
By observing the answers with which the respondents least agree, the biggest disagreement with the answers from the Adapted Child was noted (43,36%).

Grafikon 2. Odgovori sa kojima se ispitanici najmanje slažu
Chart 2. Answers with which respondents least agree



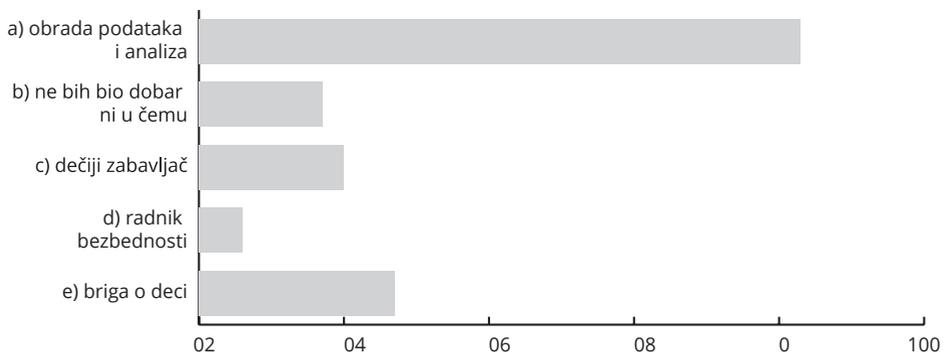
We find the following answers of the respondents in analyzing the individual questions. 46.41% of respondents believe that their ideal career would be professor or assistant, 15.69% see themselves in artistic activities, 14.38% in the medical professions, 13.07% in the job of a police officer or detective and 10.46% said that their ideal career would be in the field of accounting or lawyer.

Grafikon 3. Moja idealna karijera
Chart 3. My ideal career would be



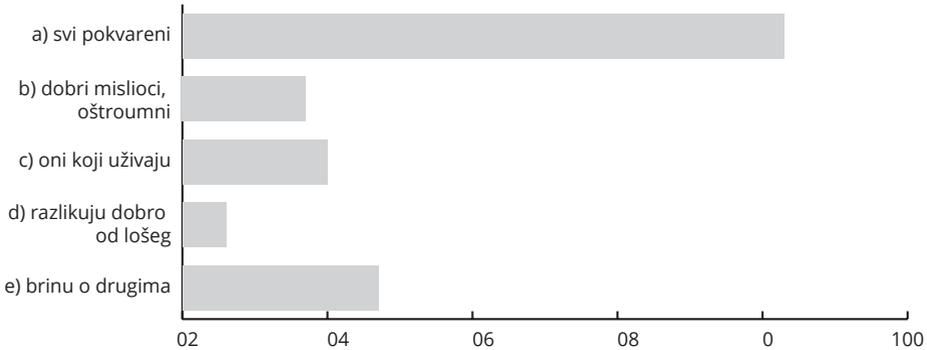
By analyzing the secondary occupations that Mensa Serbia members would like to deal with, an interesting conclusion is that more than 50% of respondents, more precisely, 54.25% of the respondents would enjoy a job of data processing and analysis. Child care covers 17.65% of all responses, the child animator 13.07%, the security worker 3.92%, while 11.11% of the respondents consider that they would not enjoy or be good in any of the activities above.

Grafikon 4. Sporedan posao u kome bi uživao
Chart 4. Part time work I would enjoy is



As for the attitude on the performance of 58.82% highly intelligent individuals believe that successful people are sharp and good thinkers, 13.73% of respondents believe that these are people who enjoy, 9.8% think that successful people are corrupt, while the same as many as 9.8% think that successful people make a difference between good and bad. Only 7.84% of respondents said that successful people are those who care about the others.

Grafikon 5. Uspešni ljudi su
Chart 5. Successful people are



Regarding attitude and awareness of oneself as well as insight into their own characteristics and talents, Mensa Serbia members gave different answers on how they see themselves and how the others see them. Answer the others say that I am helpful and polite chose the 37,25% of the respondents, well informed 26,80, rebel and brawler 14,38% of respondents, 13,07% of respondents are able to express their authority, while the least of respondents 8,50% say that they are capable of expressing feelings.

Tabela 1: Procenat ispitanika u pet ego stanja
Table 1: Percentage of respondents in five ego states

	KR	NR	O	SD	AD
Moja idealna karijera My ideal career would be	14,38%	13,07%	10,46%	15,69%	46,41%
Sporedan posao u kome bi uživao Part time work I would enjoy is	3,92%	17,65%	54,25%	13,07%	11,11%
Uspešni ljudi su Successful people are	9,80%	7,84%	58,82%	13,73%	9,80%
Drugi kažu da sam ja Others say that I am	8,50%	37,25%	26,80%	13,07%	14,38%
Vidim sebe kao I see myself as	18,30%	7,19%	33,33%	27,47%	13,73%
Volim ljude koji I love people who	22,88%	12,42%	22,88%	13,07%	13,07%

When asked how to see themselves the most respondents gave the answer as interested in learning, 33,33% of them, while 27,47% see themselves as witty and spontaneous, critical of themselves and the others,

18,30% of respondents see themselves as someone who sets high standards, 13,73% of respondents see themselves as thoughtful, while the least respondents, only 7,19% , see themselves as a fearful person

Answers to the question "What kind of people do I like" are mostly evenly distributed. 22,88% of respondents like people who are interesting for friendship, the same percentage love those who know how to distinguish right from wrong, 28.76% like people who are well-balanced, 13.07% prefer the people who laugh a lot, and 12.42% love people who care about others.

Discussion

By analyzing the respondents' responses, it can be noticed that the dominant ego state is highly overdrawn by intelligent individuals who make up only 2% of the total Adult population 29.97%. In this study, significant resistance to the ego state of the Adapted Child is also evident (Chart 2). In order to understand the causes of this nonadaptation, we will observe the development of personality from the aspect of the TA life script.

In Transactional analysis, it is considered that by the age of seven we are adopting Injunctions and Permissions from parents and other authorities. Script Decissions decisions can be made later on after a life crisis or a stressful event. These scripting decisions form a life script that represents an unconscious lifestyle that directs an individual in different life situations(Hargaden, & Sills, 2014).

Script imperative is a message that tells the child what kind of childe he or she should be in order to be loved or to have a right to exist. As long as a person manages to functionate and accomplish set tasks, he or she lives in a counter script. The script is activated when a person no longer succeeds in performing the set tasks. There are 12 basic orders (prohibition) in the Transactional analysis: Do not be (do not exist), Do not be what you are, Do not be child, Do not grow up, Do not be close, Don't, Do not be important, Don't succeed, Do not belong, Do not be good (Do not be healthy), Do not think, Do not feel (Fornaro, 2016).

In the development of highly intelligent individuals, they encounters situations when, due to their particularities of intelligence within the personality, they are inadequately socially accepted in the society of their peers. During early formal education, children receive tasks that intelligent children can do without investing too much time and intellectual work. The reason for this unacceptance is the intellectual success that other children in their early childhood achieve with more effort or do not achieve despite the extraordinary effort and exercise. Basically this emotion is an emotion of envy. An intelligent child seems to be either unsuccessful and accepted, either successful or unacceptable. Because of this, often these children make a decision by which they form their life script that carries in itself a Injunction. If they decide to be socially accepted, very often in this case, because of the ban on success, their script is losing and these individuals become depressed and dissatisfied persons

(Lazarević, Tomin, & Milivojević, 2015). If their decision is the opposite, i.e., if they choose to be successful and unacceptable counteract when these individuals become socially isolated and dedicated to the areas of their success in accordance with the autonomous decision that is found in this research (Barabasz, A., Barabasz, M., Christensen, French, & Watkins, 2013; Jaiswal, & Srivastava, 2013).

By analyzing certain ego states on certain questions (Table 1) respondents answered, we obtain results on the choice of occupation that say that 46.41% of the respondents choose the profession from the state of the Adapted Child. 15.69% of highly educated intelligent persons in the choice of occupation are guided from the ego state of the Free Child, and with such a decision is later satisfied and only 10.46% from the ego state of Adults expressed themselves about how to see their future career.

It is interesting that in one of the following questions about the side occupation in which they would enjoy, 54.25% of respondents responded from the ego state of Adults. These can later be those people who, in addition to the basic occupation, do another job in which they are much better and more successful than the primary occupation exactly because of the decision to choose the profession from an inadequate ego state, or they had to do something that brings a profit, and in their free time they dealt with something that does not make a profit.

According to the success and successful members of Mensa, they have mostly the attitude from the Adult ego state. Even 58.82% of respondents answer this question from the ego state of Adults. It could be said on the basis of these responses that highly intelligent people have a correct or real relationship to success people and success. They do not show resistance to success and are emotionally stable and objective in relation to successful individuals.

The highest number of respondents have chosen Nursing Parent 37.25%, on the question how others see them, Adult 26.80%, Adapted Children 14.38% of respondents, Free Child 13.07% and the lowest number of respondents 8.50% responded from ego states Criticizing Parent. Too nourishing attitude of Mensa's members towards the attitude of other people to highly intelligent people, have less interest in what others think of themselves or are less assertive.

On the contrary, even 18.30% of these respondents show a more critical attitude, and only 7.19% of them show the least nourishing attitude, indicating if we compare this with an opinion about how others see me, that highly intelligent people put others in front of themselves respecting their opinion, while criticizing themselves. A large number of respondents answered this question from the ego state of Adults 33.33%. Free child in relation to himself occupies 27.47%, and adapted Child 13.73% of all respondents.

In responses related to the characteristics of the people who are favourable Mensa Members, 22.88% of the respondents answered from the adult, almost the same percentages answered from the Criticizing Parent, 28.76% choose the people they like from the Free Child, 13.07% from Adaptable Child, and 12.42% from Nursing Parent.

In accordance with the state of the person in which he or she makes

important decisions about life, his or her future is also developing. The decision-making moment as a reality in decision-making is in many ways important, but it is also subject to correction. In psychotherapy with every individual, it is possible to isolate precisely the ego state that carries internal or external conflict communication and work with it to repair this wrong or scriptable belief (Alladin, 2013; Brajović-Car, & Ellersch, 2015; Kaygusuz, & Ozpolat, 2016).

Conclusion

In this study, it can be seen that the respondents have a set of measures to use Adaptable Child behavior, or a smaller amount of time during which Adaptable Child behavior is manifested. The expression of autonomous morality with the prevalence of justice in relation to obedience could be one of the interesting topics for future research.

References

- Alladin, A. (2013). Healing the wounded self: Combining hypnotherapy with ego state therapy. *American Journal of Clinical Hypnosis*, 56(1), 3-22.
- Barabasz, A., Barabasz, M., Christensen, C., French, B., & Watkins, J. G. (2013). Efficacy of single-session abreactive ego state therapy for combat stress injury, PTSD, and ASD. *International Journal of Clinical and Experimental Hypnosis*, 61(1), 1-19.
- Blagojević, S. Stvaranje efektivne komunikacije između organizacije i spoljašnje sredine. *Inženjerski menadžment* 2015; 1 (1):13-20
- Brajović-Car, K., & Ellersch, P. (2015). Transactional analysis psychotherapy of mixed personality disorder. *Engrami*, 37(1), 83-87.
- Car Brajović, K. (2011.) Razlike u zadovoljstvu brakom ovisno o profilu egograma i stilu interpersonalne razmjene partnera. *Ljetopis socijalnog rada*, 18(1): 63-81
- Clarkson, P. (2013). *Transactional analysis psychotherapy: An integrated approach*. Routledge.
- Ertem, M. Y., & Kececi, A. (2016). Ego States of nurses working in psychiatric clinics according to transactional analysis theory. *Pakistan journal of medical sciences*, 32(2), 485.
- Fornaro, A. (2016). Rethinking Ego States in an Intersubjective Context. *Transactional Analysis Journal*, 46(3), 209-221.
- Hargaden, H., & Sills, C. (2014). *Transactional analysis: A relational perspective*. Routledge.
- Jaiswal, B., & Srivastava, P. (2013). The effect of transactional analysis ego states on conflict management styles. *IUP Journal of Soft Skills*, 7(2), 7.
- Janković, J., Bačić, A., Krišto, I. *Dinamika malih edukativnih skupina*. 2014.
- Janković, J., Laklija, M. Povezanost ranih roditeljskih poruka i nepoželjnih oblika ponašanja djece osnovnoškolske dobi. *Kriminologija i socijalna integracija*, 2011; 2: 27-43.
- Kaygusuz, C., & Ozpolat, A. R. (2016). An Analysis of University Students' Levels of Self-control According to Their Ego States. *Eurasian Journal of Educational Research*, 16(64)
- Kuijt, J. D. (1978). *Transactional analysis ego states: subdivisions and definitions determined by latent partition analysis* (Doctoral dissertation, University of British Columbia).
- Lazarević, M., Tomin, G., & Milivojević, Z. (2015). Love and depression in highly intelligent individuals. *Engrami*, 37(4), 79-87.
- Stewart, I., Joines, V. (2011) *Savremena transakciona analiza*. Novi Sad, 3:55-59

EGOGRAM KOD VISOKO IZNADPROSEČNO INTELIGENTNIH OSOBA

Marija Lazarević¹, Boris Teodosijević² & Petar Stojiljković³

¹Dom zdravlja „dr Milenko Marin“ Loznica Srbija

²Subotica, Srbija

³Ministarstvo finansija, Beograd, Srbija

Apstrakt

Uvod: Erik Bern je definisao ego stanje kao stalni obrazac osećanja i doživljaja koji je u direktnoj vezi sa odgovarajućim stalnim obrascem ponašanja. U komunikacijskom modelu ego stanja u Transakcionoj Analizi idealni dijagram sadrži pet ego stanja koja su poželjna: Pozitivan Kritikujući Roditelj, Pozitivan Negujući Roditelj, Odrasli, Pozitivno Slobodno Dete i Pozitivno Adaptirano Dete.

Cilj rada je procena ego stanja visoko iznadprosečno inteligentnih osoba, radi usmeravanja načina i poboljšanja kvaliteta njihove komunikacije.

Metod: Ispitivanje je radjeno na grupi od 153 ispitanika članova Mense Srbije. Testirana su Ego stanja ispitanika pomoću Upitnika za procenu ego stanja u Transakcionoj Analizi poredjenjem odgovora ispitanika prema stepenu slaganja (slažem se-ne slažem se).

Rezultati: Istraživanjem je utvrđeno da je dominantno ego stanje Odrasli najviše zastupljeno (29,97 %), dok su ostala ego stanja manje zastupljena. Posmatranjem odgovora sa kojima se ispitanici najmanje slažu, zapaženo je najveće neslaganje sa odgovorima iz Adaptiranog Deteta (43,36%).

Zaključak: U ovom istraživanju se vidi da kod ispitanika postoji snižena mera manifestacije ponašanja ego stanja Adaptirano Dete. Izraženost autonomne moralnosti sa predominacijom pravednosti u odnosu na poslušnost bi mogla biti jedna od interesantnih tema za buduća istraživanja.

Ključne reči: inteligencija, ego stanje, transakciona analiza, egogram

WHAT CAN WE DO WITH WORDS

Valentina Parović^{1,2} & Milena Mihajlović^{2,3}

¹Gimnazija „Uroš Predić“, Pančevo, Srbija

²Regionalni centar za talente „Mihajlo Pupin“

³3OHills, Beograd, Srbija

Abstract

The aim of the paper is to show different ways to create new words throughout learning and language play, as well as to show how word creation play affects the cognitive abilities of children, and why we are playing with words. In this paper we are also exploring the word creation process through the prism of creativity, neuroscience and cognitive science, as well as its effect on children and their development. Through this paper, we want to show what happens in our brain when we create new words and why this knowledge is important to us.

New words come with the emergence of novel items or phenomena. New items are named in several ways. In the naming process, we use language mechanisms such as derivation, polysemy, borrowing words from other languages, and sometimes we “revive” an archaism. In dealing with gifted children in the field of language at the Regional Center for Talents “Mihajlo Pupin” in Pancevo, we often create new words. In this process, through the play, we create words for objects and phenomena that we are familiar with, but we do not know their names. Students then question whether a potential lexicon would become realistic. It is a special kind of *lexical futurism*. Throughout the game, students master different ways in the naming process, and the newly created words remain an indicator of understanding, application, as well as their sense of humor.

The aim of this paper is to show how to create new words in the Serbian language, as well as to explore the neurocognitive correlates of creative word play, in order to understand the importance of creativity and language play that involves the creation of new words in the classroom.

Key words: new word, derivation, polysemy, borrowings, creativity.

Introduction

Whenever new phenomena appear, they should be named. How the process of naming objects or any other phenomena works is certainly a good linguistic question. Therefore, it is an excellent research topic for our Linguistic group at the Regional Center for Talents “Mihajlo Pupin”. During the 2015/2016 school year, the students were advised to focus on the language mechanisms of naming the new phenomena, particularly:

derivation, polysemy, borrowing, *reviving* archaisms. Our workshops were organized in such a way that we encouraged students not only to think about the language mechanisms of naming, but also to research whether those new names, as part of the potential lexicon, would become part of the permanent lexicon.

Method: the Mechanisms of Creating New Words in Serbian

Our workshops were organized in the following way. First, we provided students with *tools*, i.e. we taught them the language mechanisms related to word creation: derivation, polysemy, borrowing. Each of these topics was gradually introduced to students. Second, we challenged them and *let them play* with words while learning each of the linguistic mechanisms for word creation. The method of word playing during the class will be explained in the following section.

Derivation

Derivation is the process of creating new word from an existing word by adding a suffix or a prefix. The extent to which a certain lexeme became part of the lexicon is shown by the number of its *derivatives*. Students were introduced to the derivation clusters, motive words, as well as the terms such as *first-degree* and *second-degree* derivatives (Gortan-Premk, Vasić & Dragičević 2006). Students were instructed to choose a word from the school and its surrounding and make as many derivatives as possible. We have chosen the context of school, as a lexical context that is well-known to our students.

The results were impressive. Kapunac and Tomašević (2015) created a semantic-derivation dictionary. It was interesting to observe their discussions about words and their derivatives that included questions such as why some words have higher number of derivatives than others. For instance, there are 37 listed derivatives for the lexeme *učiti* "to study", and only 2 listed derivatives for the words *tabla* "blackboard", *dnevnik* "day-book" and *klupa* "bench" (cf. Parović, 2017; Kapunac & Tomašević, 2015). The derivatives for *učiti* "to study" include the following:

- (1) *Naučiti, nauk, naučnost, naučenjak, naučenjaštvo, učen, učenik, učenikov, učenica, učeničin, učeničić, (...) učenički, učenost, učenjak, učenjakov, učenjački, učenje, učitelj, učitelj, učiteljevanje, učiteljevati, učiteljica*

On the basis of the whole collection of the derivatives, we learned to distinguish first-degree derivatives and second-degree derivatives. For instance, from the verb *učiti* "to study", as a motive word, first-degree derivative would be *učen* "educated", while *učenik* "student" is a second-degree derivative. In the dictionary (Kapunac & Tomašević, 2015), this example would be presented as in the example 2.

- (2) 0 *učiti, -im* "to study", imperfective aspect
 $1_1 < 0$ *na-učiti, -im* "to study", perfective aspect
 $2_1 < 1_1$ *nauk-ø* m. "lesson"

- $2_2 < 1_1$ *nauč-en, -a, -o* "educated"
 $3_1 < 2_2$ *naučen-ost* f. "the state of being educated"
 $3_2 < 2_2$ *naučenj-ak* m. "scholar"
 $4_1 < 3_2$ *naučenja-štvo* n. "learning"

The research (Kapunac & Tomašević, 2015) showed that the majority of derivatives are first-degree derivatives. The higher the derivative degree, the less number of derivatives there are. Moreover, their research accounts for the students' research and critical thinking abilities at the third year of high school.

Other activities included asking for students to name the items we do not have an established name for. Examples of the created words include:

- (3) *lak-o-slom*, "the handle of the pen that easily brakes"
sunđer-ište, "the place for a sponge at the classroom"
kred-ičnjak, "the place where chalk is held"

Since the students like to sit at the place under the window in classroom, they were highly creative in forming words for this place:

- (4) *pot-prozor-njak*, "below-window-board"
nad-radijator-nik, "above-radiator-board"
na-lat-njak, "leaning-on-elbows-board"
guzič-njak, "buttocks-board"

During of the games, students created the following words:

- (5) *gore-dol-nik*, "elevator"
ne-smrd, "deo spray"
tečno-čuv, "bottle"
smrt-o-spas, "snack"
piš-a, "pencil"
anti-cur, "cork"
vuci-gur-ač, "door handle".

Polysemy

Polysemy is the capacity of the word to have multiple meanings. Usually, novel word meanings are created through the lexical mechanisms that include metaphor and metonymy. Lexical metaphor and metonymy are expressions of the need for nomination. We do not have another word for a wing (of an aircraft), a leg (of a chair) or a head (of a motor). When we do not have a word, one of the lexical mechanisms activates (Dragičević, 2007).

In Serbian, we usually say that we have, e.g. "eaten three plates of soup", or that we have "drunk three glasses" of some liquid. Moreover, if we hear that "white coats" are on strike, we will know that it is healthcare workers who are on strike. These are examples of *metonymy* we use every day (cf. Parović, 2017).

The same words that acquired their name through the process of derivation, could as well be named through the mechanisms of metaphor or metonymy. For instance, students named both *kredičnjak* (see example 3) and *nalatnjak* (see example 4) as *daska* "board". Therefore, we could together observe how polysemy is developed, and why these objects were named with the same name (Parović, 2017).

(6) *daska*, f. "board"

1. a. *pljosnat i širok komad drveta, male debljine* "flat and wide piece of wood, small thickness"

b. fig. *mršava ženska osoba*, "a skinny woman"

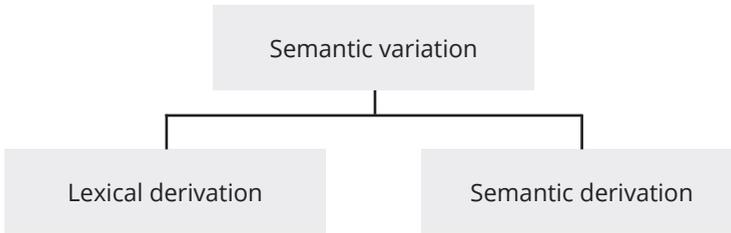
2. pl. fig. *pozornica, bina*, "a stage"

(Rečnik srpskohrvatskog književnog jezika, 1967, book 1, 618)

In addition, students were introduced to the term *semantic derivation*. The difference between lexical derivation we mentioned in section 2.1. and the semantic derivation, is in the fact that the result of a semantic derivation is not a novel word (as with lexical derivation), but only a *novel meaning*. Therefore, semantic derivation is functionally more related to polysemy than to the lexical derivation (cf. Parović, 2017).

Semantic variation is actually a *hyperonym* (superordinate) of semantic derivation and lexical derivation. The following image 1 illustrates this relationship.

Image 1. The hierarchy of semantic variation.



Hypernyms and hyponyms are probably better understood through the real-world example. For instance, a term of *flower* would be a hypernym for the terms of *rose*, *orchid*, *iris*, etc. Semantic variation is, therefore, a *hypernym*, while lexical and semantic derivation are its *hyponyms*, i.e. lexical and semantic derivation are subordinated to the term of semantic variation (see Image 1).

Borrowing

A teacher might start from his own language experiences and ask students to think about theirs. For example: "When I was a pupil, we all had *digitron* 'calculator', it was only the teacher of mathematics who forbid *kalkulator* 'calculator'". The teacher calls for a learner's linguistic experience: "Would you say *računar* 'computer' or *kompjuter* 'computer'?" (Parović, 2017)

In the first example, both *digitron* and *kalkulator* have the same meaning of calculator. In the second example, both words mean "computer". However, most of the young people would say *kompjuter* for "computer", as well as *digitron* for "calculator".

This could open the debate: Are the synonyms linguistic blessing or a ballast? Exploring the absolute and relative synonyms, students learn about language economy and they can discuss the question of absolu-

te synonyms. The teacher asks students to think about the origin of the lexemes *računar* and *kompjuter* "computer". Eventually, we come to the linguistic mechanisms of word creation, in this example: *derivation* and *borrowing*.

Certainly, borrowing is a relatively common way of naming new things, especially within the field of technology and media. For instance, *softver* "software", *hard-disk* "hard disk", *smartfon* "smartphone", *menadžer* "manager", *marketing* "marketing", and others. Students are then advised to do a small research on the borrowed words within some of the semantic fields, e.g. technology. Furthermore, some of the borrowed words have derivatives while others do not have them. We discuss the reason why it is so and whether the number of derivatives is the only criterion of how much the lexeme became established within a language. For instance, *kompjuter* "computer" does not have many derivatives, even though it is highly frequent. How could we explain such a thing?

Reviving archaisms

Reviving archaisms is another way of spreading the active lexicon. How the lexemes from the *periphery* of the lexicon come to its *center*? For instance, 30 years ago the lexeme *gospodin* "sir", was unwelcomed and anarchic, but today we use it for addressing with positive connotation. During that time, *drug* "friend" was the lexeme used for addressing other people. However, today we use *drug* "friend" with its original meaning, not for addressing others. Therefore, words can have different meanings and different connotations at different time.

An example of revived lexeme would be *alas* "river fisherman". Even though it seemed to be on the way to completely diminish, the lexeme is revived in the contemporary language, especially within the relevant field area. Moreover, it could be questioned whether *alas* is a *localism* or it is usage-related.

Image 2. Active lexicon.



Neurocognitive Perspective of the Creation of New Words

The only truly intelligent devices that can solve all kind of complex problems are human brains,(Duch, 2013, p. 4).

Creativity, as defined by Sternberg (1998) is “the capacity to create a solution that is both novel and appropriate” (p. 3). Therefore, the creativity manifests in our daily actions, and novel words are just one of the domains of our creativity. Duch and Pilichowski (2017) state that even though intelligence and creativity most likely have similar neurological basis, intelligence is not sufficient for creativity.

Traditionally, cognitive processes are divided to low-level and high-level processes. Low-level processes are those usually those all mammals are capable of, e.g. perception, motor control, etc. High-level cognitive processes are related to creative thinking, planning, reasoning, language (see Duch, 2013). The distinction between cognitive processes would not be interested, if it would not be correlated with the current performance of Artificial intelligence. Namely, even though low-level cognitive processes are successfully modeled by neural networks, the knowledge on high-level cognitive processes is still limited. Therefore, computational capacities are limited as well (cf. Dutch, 2013). For instance, language creativity, as a *high-level* cognitive process, is not easily modeled by artificial intelligence. However, neural networks are well applicable to so called *low-level* cognitive processes, such as perception, motor control, and others (cf. Duch & Pilichowski, 2007).

As Duch (2013) noted, in morphologically rich languages, such as Polish, or Serbian, new words appear every day. During our classes, we sometimes ask our students for the names of the things/concepts we do not know how their name. For instance, how should we call the thing that surrounds the old doors? Therefore, we often ask them to suggest words for the concepts we usually use syntagmas, e.g. *the thing that surrounds the door*. Finding new names for products is another form of creative linguistic thinking, e.g. names for new companies or businesses are highly valued in today's world (cf. Duch, 2013).

In the cell assembling model (cf. Duch, 2013), words are represented as strongly linked subnetworks of microcircuits that relate articulatory and acoustic word representation, as well as the meaning of the word. “This is achieved by extending the phonological representation network to bind also related perceptions and actions, grounding its meaning in being-in-the-world” (Duch, 2013, p. 6). In order for us to recognize a word consciously, the activity of its subnetwork must compete to win an access to the working memory. According to this model, whenever we hear a word, there “activates string of phonemes increasing the activity (priming) of all candidate words and non-word combinations” (Duch, 2013, p. 6). Duch (2103) also supposes that polysemic words have a single phonological representation, but different semantic extensions. It is *context* that selects extended subnetwork that is related to the unique word meaning. The words that use larger subnetworks, i.e. subnetworks that are common to many words, have higher chances of winning. Creativity requires two components at the level of neurons, as stated in Duch (2013): neural

activity that is related to imagination and the activity of selection of “interesting results” (p. 6). According to Duch (2013), creative brains might have greater imagination, produce more varied combinations, and probably observe interesting combinations through emotional and associative filtering (p. 7).

Conclusion

Finally, this paper shows not only how words are created in the Serbian language, but also what could be a neurocognitive perspective of word creation. Playing with words is certainly connected to students' creativity, imagination and associations. Whether a word would become part of the permanent lexicon or not, we do not know. Vuk Stefanović Karadžić created 84 words necessary for the translation of the *New Testament* in 1847, the second part of the *Bible*. Those words later became part of the permanent lexicon.

The results of our language play at the classroom are not only students who report that they use some of the words they created in their everyday communication, but also the semantic-derivational dictionary (Kapunac & Tomašević, 2015) created by students.

To conclude, we believe word creation play offers us an excellent opportunity for creating new linguistic questions, as well as for the development of linguistic competence. Throughout the play, students think about their lexicon, realize patterns, create and question.

References

- Драгићевић, Р. (2007). *Лексикологија српског језика*. Београд: Завод за уџбенике.
- Duch, W. (2013). Computational creativity. *Encyclopedia of Systems Biology*, 464-468.
- Duch, W., & Pilichowski, M. (2007). Experiments with computational creativity. *Neural Information Processing—Letters and Reviews*, 11(4-6), 123-133.
- Gortan-Premk, D., Vasić, V. & Dragičević, R. (2006). *Semantičko-derivacioni rečnik, Sveska 2: Čovek – unutrašnji organi tkiva, psihofiziološka stanja i radnje, psihofizičke osobine, srodstvo*. Novi Sad: Filozofski fakultet, Odsek za srpski jezik i lingvistiku.
- Гортан-Премк, Д. (2004). *Полисемија и организација лексичког система*. Београд: Завод за уџбенике.
- Капунац, С., Томашевић, В. (2015). Семантичко-деривациони школски речник. *Свет речи*, 39-40, 78-86.
- Паровић, В. (2017). Како настају речи у српском језику. *Школски час српског језика и књижевности*, 2, 102-110.
- Sternberg, R. J., & Lubart, T. I. (1998). The concept of creativity: Prospects and paradigms. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 3-15). Cambridge: Cambridge University Press.
- Речник српскохрватскога књижевног језика, Књига 1, 618* (1967). Матица српска — Матица хрватска: Нови Сад — Загреб.

ŠTA MOŽEMO S REČIMA

Valentina Parović^{1,2} & Milena Mihajlović^{2,3}

¹Gimnazija „Uroš Predić“, Pančevo, Srbija

²Regionalni centar za talente „Mihajlo Pupin“

³3OHills, Beograd, Srbija

Apstrakt

Cilj rada je da pokaže kako se različitim načinima stvaraju nove reči uz učenje i igru, te kako to utiče na kognitivne sposobnosti dece i konačno, zašto se igramo rečima. U ovom radu bavimo se i stvaranjem novih reči kroz prizmu kreativnosti, neurologije i kognitivnih nauka, kao i primene ove metode na decu i njihov razvoj. Kroz rad, prikazujemo šta se dešava u našem mozgu kada kreiramo nove reči, kao i zašto nam je važno ovo saznanje.

S novim predmetima i pojavama dolaze i nove reči. Novi predmeti imenuju se na nekoliko načina. U procesu imenovanja koristimo jezičke mehanizme kao što su derivacija, polisemija, pozajmljivanje reči iz drugih jezika, a ponekad i "oživimo" neki arhaizam. U radu sa darovitom decom u oblasti jezika u Regionalnom centru za talente "Mihajlo Pupin" u Pančevu, često se bavimo novim rečima. U tom procesu, kroz igru, stvaramo reči za predmete i pojave koje su nam poznate, ali nisu imenovane. Učenici zatim ispituju da li će neka potencijalna leksika postati i realna. To je svojevrсни leksički futurizam. Kroz igru, učenici ovladavaju različitim načinima u procesu imenovanja, a novosmišljene reči ostaju kao pokazatelj razumevanja, primene, a neretko i duhovitosti.

Ovim radom želimo da pokažemo pre svega kako u srpskom jeziku stvaramo nove reči, zatim i da se osvrnemo na neurokognitivne korelate kreativnog igranja rečima, kako bismo razumeli značaj kreativnosti i igara koje podrazumevaju stvaranje novih reči u nastavi.

Ključne reči: nova reč, derivacija, polisemija, pozajmljenice, kreativnost.

UDC 159.922.7
316.728-053.2

EDUCATIONAL USE OF TRANSACTIONAL ANALYSIS IN WORK WITH CHILDREN

Olga Trifunović

Preschool institution - kindergarten „Mala škola“, Sremska Kamenica, R. Serbia

Abstract

Childhood is a period of time which is characterized by getting to know yourself, the others and the world. Because of scarce life experience and specific cognitive abilities child is not in a position to make realistic decisions about who it is and what is it like, so the most important persons that affect child's self perspective are - the parents.

With child's going to kindergarten and school, other important adults appear, and they affect forming the reference frame of the child. Child spends several hours in preschool, and later in school, so the role of educator, teacher, professor, is essential for child's understanding of itself and recognizing personal values. Because of that, adults mission in educational process is to behave and communicate in a way which will influence building positive identity of child and taking "I am OK - you are OK" life position.

The aim of the paper is to present theoretical knowledge in the field of practice in taking the "I am ok - you are ok" position within pre - school children. Through interviews, games, drawings and demonstrations, the results of work with children will be presented, indicating a change in the communication patterns between child-child and child-adults, increased ability to distinguish themselves from their behavior and accept positive unconditional and conditional strokes (+ BS, + US) as well as negative conditional stroke (-US) and ways of rejecting negative unconditional stroke (-BS). Through practical examples, the concepts of Transactional Analysis (TA), the difference between beings and behaviors and strokes will be presented. These concepts are used in work with children to influence the development of their potentials, providing basis for developing their giftedness.

Keywords: child, early childhood, transactional analysis, self perspective, development of potentials.

Introduction

The aim of this paper is to display educational use of Transactional analysis in preschool institution "Mala škola". We started working in 1995, with intention to provide a place to play, socialize and learn, with programs which will encourage personal growth and development of every

child, and we are specially devoted to primary psychological prevention.

Preschool teachers are educated for educational use of Transactional analysis (TA), work in 3 mixed educational groups. Teachers attended accredited seminar "Mercedes model", whose author is psychotherapist Zoran Milivojević, and through which they learned basic TA concepts and were trained to use them in everyday communication with children.

The ability to differentiate beings and behaviors is of great importance because it gives child possibility to understand reality, for example that the parent can love him and refuse to fulfill his wish at the same time, it helps the child to understand criticism and conflicts in the right way, and in some cases it can get child to overcome disorders.

On understanding the difference between beings and behaviors, we work with children from age 2,5 to 7, through different work methods.

Working Through Free Activities And Playing

By observing and listening the children and their spontaneous playing, teachers often hear children talking about themselves in unrealistic way. They say for themselves: "I am rude" or "I am stupid", or "I'm clumsy"... Task of the teacher, when she hears such unrealistic statement from child, is to:

- a) turn the addressing to the being into the addressing to the behavior;
example: If one child is playing (M), and the other takes it's toy (N), M will tell to the teacher:
"N. took my toy...he is rude!"
Teacher "transfers" addressing to the being into the addressing to the behavior and says:
"N. is not rude. His behavior was wrong."
She approaches N. and tells him: "You are M's friend. When you want the toy he is playing with, you need to say "M, give me the toy".
- b) to direct + unconditional strokes (US) to praise the being to form child's positive selfimage;
Example: "N, you are a smart boy who knows how to tell what he wants" or
"You are a beautiful girl although J. doesn't want to play with you",
or
"J, you are handy even though you didn't score a goal today"
- c) to direct + conditional strokes (CS) and - conditional strokes (CS), to praise and criticize behaviors to socialize children;
Example: "You behaved very well in kindergarten today. Bravo!"
"You were wrong today when you pushed S. You should have said : I want to sit on that chair".

The ability to distinguish beings and behaviors is of great importance because it gives child the opportunity to understand reality and to understand and experience conflicts and criticism in the right way.

Psychological Workshops

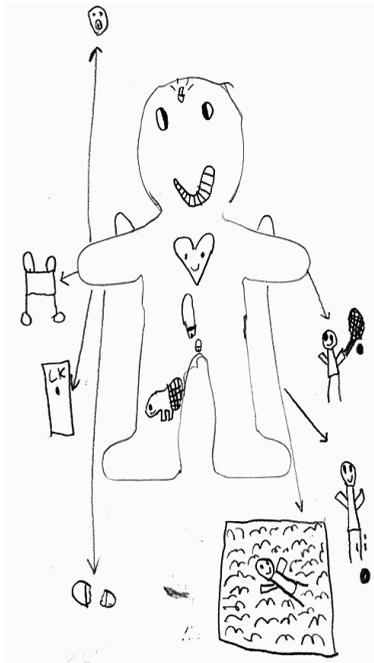
With children who are 5+ years old we work through workshops which are led by a psychologist once a week. Base on the program derived from the book "T.A. for Tots (and Other Prinzes)".

"This book is designed to help little boys and girls to know themselves, to prevent them from bad conclusions about them, to convince them that they are not frogs even when the others call them that, but that everyone of them is a prince or princess."(Freed, 1991, 21)

Tasks:

- using theoretical knowledge in practice and taking "I am OK - you are OK" position
- changing the way of communication on child-to-child and child-to-adult relations
- ability to distinguish yourself from your behavior
- acceptance + US, + CS and - CS, and non-acceptance (rejection) - US

We determine the concept of difference between being and behavior with drawings, on which child represents his characteristics on the body, right hand shows wrong behavior, and left the right one.



Picture 1.

Boy V.M, age 6:9, "decorated" his body with terms-symbols, which represent his characteristics and feelings. He thinks for himself: "I am smart, in love, capable and hardworking boy".

Right hand "describes" his wrong behavior: "I yell, push table, slam the doors, crush erasers..."

Left hand shows his right behavior: "I am good at tennis, football and good swimmer..."

Like the other children from his age group, he completely understood that he is not the equivalent to his behavior and that he, even though he does some things that are wrong, remains OK being.

With adoption of this attitude, child is in position to understand the position of other person who might do something wrong as well, but remains OK being.

Conclusion

It is extremely important to support child to think and speak it's mind. Since educational institutions are supposed to develop the system of thinking, not reproduction of learned, it is necessary for teachers and professors to learn the difference between being and behavior. In process of discovering knowledge, children can't be sure if they are thinking correct, so it is responsibility of the adults who work with them to allow them to produce ideas without withholding and fear of wrong answer. To encourage children to say what they think without fear of "looking stupid" is essential for encouragement and developing the giftedness.

The theory of Transactional analysis says that we are all OK beings, but our behavior can be right or wrong. People who work with children are obligated to learn and apply the "You are a smart child who knows how to think and you are allowed to make mistakes. Because, even then you are OK being" attitude.

References

- Freed, (2010). *T.A. for Tots (and Other Prinzes)*, Psihopolis institut: Novi Sad.
Milivojević, Z. (2000). *Emocije*, Prometej: Novi Sad

EDUKATIVNA PRIMENA TRANSAKCIONE ANALIZE U RADU SA DECOM

Olga Trifunović

Preschool institution - kindergarten "Mala škola", Sremska Kamenica, R. Serbia

Apstrakt

Detinjstvo je period koji karakteriše upoznavanje sebe, drugih i sveta. Zbog oskudnog životnog iskustva i specifičnih kognitivnih sposobnosti dete nije u mogućnosti da donese realne odluke o tome ko je i kakvo je, pa su najvažnije osobe koje utiču na detetovu sliku o sebi - roditelji.

Polaskom deteta u vrtić i školu pojavljuju se drugi važni odrasli koji utiču na formiranje referentnog okvira deteta. Dete u predškolskoj ustanovi, a kasnije u školi, provodi više sati dnevno pa je uloga vaspitača, učitelja, nastavnika ključna za detetovo poimanje sebe i prepoznavanje ličnih vrednosti. Zbog toga je zadatak odraslih u obrazovnom procesu da se ponašaju i komuniciraju na način kojim će uticati na izgrađivanje pozitivnog identiteta deteta i zauzimanje „Ja sam ok – ti si ok“ pozicije.

Cilj izlaganja je prikaz primene teorijskih znanja u domenu prakse u zauzimanju „Ja sam ok - ti si ok“ pozicije kod dece predškolskog uzrasta. Kroz razgovor, igru, crtež i demonstracije biće prezentovani rezultati rada sa decom koji ukazuju na promenu načina komunikacije narelaciji dete-dete i dete-odrasli, povećanu sposobnost razlikovanja sebe od svog ponašanja i prihvatanje pozitivnih bezuslovnih i uslovnih stroukova (+BS, +US) kao i negativnih uslovnih stroukova (-US) i načine neeprihvatanja (odbijanja) negativnih bezuslovnih stroukova (-BS). Kroz praktične primere biće predstavljeni i obrazloženi koncepti Transakcione analize (TA), razlika između bića i ponašanja i stroukovi, koji se koriste u radu sa decom i kojima se utiče na razvoj dečjih/ljudskih potencijala i stvara osnova za podsticanje darovitosti.

Ključne reči: dete, rano detinjstvo, transakciona analiza, slika o sebi, razvoj potencijala.

INDEX OF AUTHORS

A

Adamov, Jasna 125

G

Grandić, Radovan 135

I

Ilić Stošović, Danijela 11

K

Kalinić, Tanja 35

Katrina-Mitrović, Veronika 87

L

Lazarević, Marija 153

M

Marinković, Lada 64, 77

Mihajlović, Milena 163

Momčilović, Marijana 48

N

Nikolić, Mirjana 87, 135

Nikolić, Snežana 11

Nikolić, Željko 87

Ninkov, Ivona 24

Nišević, Snežana 11

O

Olić, Stanislava 125

P

Parović, Valentina 163

Pavlović, Radoje 135

Protić, Kosa 24

R

Radulović, Branka 116

S

Stojanović, Maja 116

Stojiljković, Petar 153

Š

Šćepanović, Marinela 35

T

Tadić, Rada 48
Teodosijević, Boris 153
Trifunović, Olga 171

V

Vajdić, Jovana 24

Ž

Živković, Teodora 104
Živković, Zdravko 104

CIP - Каталогизација у публикацији
Библиотека Матице српске, Нови Сад

159.928(082)

INTERNATIONAL Conference "Giftedness, Education and Development" (2 ; 2018 ; Belgrade)

Darovitost, obrazovanje i razvoj : tematski zbornik radova međunarodnog značaja = Giftedness, education and development : international thematic collection of papers / [Second International Conference "Giftedness, Education and Development", Belgrade, 31st of July to 2nd of August, 2018.] ; [editors Lada Marinković, Marinela Šćepanović]. - Novi Sad : Mensa Srbije, 2018 (Vrnjačka Banja : Satcip). - 177 str. ; 25 cm

Tiraž 200. - Bibliografija uz svaki rad. - Registar.

ISBN 978-86-80994-05-5

а) Даровитост - Зборници
COBISS.SR-ID 324519943



mensa
S R B I J E



Uz finansijsku podršku
Ministarstva prosvete, nauke i tehnološkog razvoja Republike Srbije