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Vesna Minić, Marija Jovanović, Živorad Milenović

AN ENCOURAGING ENVIRONMENT FOR THE DEVELOPMENT OF GIFTED STUDENTS WITHIN THE KNOWLEDGE SOCIETY

The aim of our paper is to conduct a theoretical and empirical analysis of the relevance of an encouraging environment in the development and progress of gifted students within the modern knowledge society. In order to ensure the highest level of sample representativeness, the research was carried out on a sample of 106 teachers working with specialized classes for talented students, and teachers who had worked with those students at their previous stage of schooling. The study was conducted in schools belonging to the areas of the City of Nis and Kosovska Mitrovica (Republic of Serbia)*, by using the scaling technique. Through factor analysis, the following 5 most prominent features (factors) of an environment that encourages the development of gifted students within the knowledge society were extracted: 1) differentiated curricula, 2) encouraging problem-based learning, 3) integrated approach to learning, 4) encouraging research-based approach to learning, 5) developing logical and creative thinking skills. This research also found that the level of schooling of gifted students significantly determines the differences in teachers' perceptions of the characteristics of an environment that encourages the development of gifted students, while school location was not a deciding factor.

Keywords: differentiated curriculum; diverse sources of knowledge; encouraging giftedness; learning society; teaching process

* This designation is without prejudice to status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence.

INTRODUCTION

The times we live in require rapid and imminent changes, both in society and in education. In order to bring education to a higher level, it is necessary to adapt to the aforementioned changes and innovation, and to eliminate numerous issues related to the teaching process. School has an abundance of potential to meet the specific needs of all students. Numerous teaching and extracurricular activities organized in school provide the opportunity to meet the needs of students who have been identified as gifted. Teaching gifted students is a popular topic in Serbian education, which many experts have been speaking and writing about. Defining giftedness has been the centre of interest of many researchers, but to this day, there has been no generally accepted definition of a gifted child. Most of descriptions agree that giftedness is a phenomenon which refers to any unusual, extraordinary behaviour that leads to achieving higher results than other individuals with similar traits. The main issue regarding the identification and development of the giftedness phenomenon in students relates to providing a stimulating and supportive environment that favourably affects outcomes and quality of giftedness. However, one of the main challenges facing teachers is the need to meet the intellectual, social, and emotional needs of each gifted child, which paves the path for flexibility, additional engagement and continuous improvement of each teacher. Bearing in mind that learning is a continuous process, the learning society phenomenon as an imperative of the 21st century, becomes the requirement for each and every participant in the process of education (Kapić 2020; Jovanović 2018). Under such conditions of rapid development of science and technology, of the fast and radical changes, the following concepts become crucial: continuing education, self-education, as well as all the other activities that are necessary for people to keep up with the changes and to be able to follow and participate in progress and in the ever-changing world (Malkić Aličković 2019; Prušević Sadović 2017).

Defining and identifying gifted students

Francis Galton was the first to study the phenomenon of gifted students as a complex pedagogical concept and tried to explain the origin and development of genius based on previous studies. Since 1920, that is, since the first thorough study of gifted students, there have been numerous longitudinal studies on this topic, with many experts explaining this phenomenon from their point of view. Giftedness implies “to have extraordinary skill and capability in terms of creativity, intellect and/or task respon-

sibility” (Birgili & Calik 2013: 67-77). Renzulli (2003: 79) states that there are two types of giftedness – lesson learning or “schoolhouse” giftedness on the one hand, implying students’ ability to master the learning material easily, and the creative productive giftedness on the other hand, which implies above-average ability, creativity and motivation to work. Gagne (2005: 99) believes that giftedness designates “the possession and use of untrained and spontaneously expressed natural abilities, in at least one ability domain, to a degree that places an individual at least among the top 10% of age peers”. Vukosav and Sindik (2010) state that giftedness can generally be defined as a set of traits that enable an individual to consistently achieve considerably above-average results in one or more of the activities he or she engages in. According to Koren (1989: 16), the following traits that characterize gifted students are these: general intellectual ability (high level of intelligence, curiosity, eloquence, logical reasoning ability, good memory...); creative/productive abilities (divergent thinking, imagination, flexibility, fluency, originality, deductive reasoning...); school-related abilities (special interest in learning, good memory, wide range of information...); leadership ability (quick to adapt to new situations, successful socialization, communication and collaboration skills, good organizational skills...); artistic abilities and psychomotor abilities. Dejić, Cebić, and Cucić (2011) point out that the definitions of giftedness can be divided into those that speak about giftedness in general, and those that specify an area of giftedness depending on whether they explain the area in which the giftedness is demonstrated. These authors emphasize its general indicators: giftedness is not a result of one characteristic, but rather a combination of traits, abilities and personality itself; giftedness can occur in different areas of ability, either as a single ability, or as a combination of abilities that emerge in some area of human knowledge and activity; giftedness can be manifested as productive-creative activity and results or as a potential, latent trait, which can develop into productive giftedness, that is, creativity with the support and encouragement from the environment.

Identifying or recognizing gifted students is a major challenge in modern teaching. Therefore, it is important to understand that “...gifted and talented students are not a homogeneous group. Not all of them show the same characteristics or traits, but rather a wide range of individual differences“ (George 2005: 15). Giftedness can be manifested at different stages of their lives. A child can show talent in one area (for example: painting, music) or in multiple areas at the same time. Different areas in which a student can be identified as gifted can serve as “multiple sources of information, that is, different criteria to identify gifted students”. People who collect such and other information about students are “...parents, teachers, school psychologists and

pedagogues, vocational guidance services, and others interested in talented and highly productive staff, for their professional education and employment” (Milic 2011: 114). Therefore, significant methods to identify giftedness are teacher, parent and peer assessment, as well as student self-assessment. Farral & Henderson (2015) state that significant ways in which gifted behaviour can be identified include samples of children’s work, participation in competitions, solving certain tasks, auditions, etc.

According to Djordjevic (1998: 22), a high level of intellectual ability is a prerequisite for giftedness, since it shows a high degree of abstract intelligence, but it does not yet explain the overall giftedness. Early identification of student giftedness implies a “specific type of (cognitive) abilities assessment, in which we specifically monitor the indicators that these abilities are at an exceptional level – in other words, we try to identify signs of particular speed, ease and independence in mastering the appropriate domain, compared to the results of individuals with similar prior experience” (Dimitrijevic & Tatic Janevski 2016: 50). Testing has a crucial role in identifying gifted individuals because giftedness is still identified and remains inextricably linked to intelligence testing (Brown et al. 2005). With regard to identifying gifted students, Pfeiffer (2013) has introduced the *Tripartite model of giftedness* which offers three different ways to identify gifted students: the first suggests viewing giftedness through a lens of high intelligence, the second suggests viewing giftedness through a lens of outstanding accomplishments, and the third one through a lens of one’s potential to excel.

When it comes to gifted students, it is necessary to note that in Serbian and Croatian language two different terms are mainly used for these children: *gifted students* and *brilliant students*, while another substitute term in Croatian language is used for gifted students, and that is *highlycapable students*. The third term used is the term of foreign, Italian origin, and that is *talented students*. In pedagogical encyclopaedias and dictionaries, these terms are defined differently, which is not quite legitimate, because those are different terms that define the same term – *above-average students*. These children very early on show signs that they could develop into inventors in a scientific discipline, i.e., social or sports discipline, they progress faster than other children, solve tasks differently, and ask adults for minimal or no help at all (Milenović 2013). Due to the fact that the term *gifted students* is widely used worldwide, when approaching the problem of this research, we have decided to use this term as well.

Research Focus

The aim of this paper is to investigate the characteristics of an environment supportive of the development and improvement of students' giftedness within the contemporary knowledge society. Based on the general procedure of this research and its specific research, the research was determined by identifying teaching processes on the most common factors that determine the basis of research of Student Founders who will research student development (primary and secondary school), school location (Nis or Kosovska Mitrovica) and teaching processes within the environment as a stimulus for the development of adult students in the concept of knowledge society.

RESEARCH METHODOLOGY

The study was conducted in schools belonging to the area of the City of Nis and Kosovska Mitrovica (KM) (Republic of Serbia).

Research sample

In order to achieve the highest level of sample representativeness, the research was carried out on a sample of 106 teachers working with specialized classes for talented students, and teachers who had worked with these students at their previous stage of schooling.

Table 1. Participant structure in relation to the variable sussed

Schooling level	N	%
Primary school	48	45.30%
High school	58	54.70%
Total	106	100%
School location	N	%
KM	51	48.10%
Nis	55	51.90%
Total	106	100%

The characteristics of the sample selected relative to the variables used are shown in Table 1. As the table shows, 54.70% of the survey participants are secondary schoolteachers, while 51.90% of the surveyed teachers are from the territory of the Nis School Administration.

Instrument and procedures

The research data were collected by the Scale of influence of a stimulating environment on the development of giftedness in the context of the knowledge society (Scale: ISE-DGCKS), which was designed for the purpose of this research. It consists of 42 items with a five-point scale of agreement.

The possibility of conducting the factor analysis was determined based on the data obtained from the rating scale, on checking the factorability of the intercorrelation matrix using the Kaiser-Meyer-Olkin Test (KMO), and on the Bartlett's test values shown in Table 2.

Table 2. KMO and Bartlett's Test of Sphericity

Bartlett's Test of Sphericity df	861
Sig.	.000
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.756
Approx. Chi-Square	3037.046

Data Analysis

By using the factor analysis of the data collected and descriptive statistics tools such as t-test and f-test, the main characteristics of an environment that encourages the development of gifted students were identified, as well as their correlation with the level of education of gifted students and the school location.

Table 3. Cronbach's alpha coefficient

Instrument reliability	
α	.884

The reliability of the instrument was tested by Cronbach's alpha coefficient, which showed a very good value ($\alpha = .884$) (Table 3).

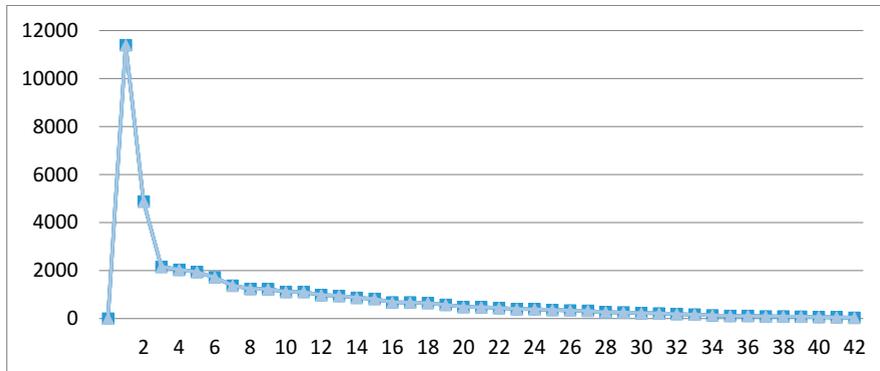
RESEARCH RESULTS

The data collected by the research were first subjected to principal component analysis by factor analysis with Varimax rotation.

Table 4. The structure of the extracted factors of an environment that encourages the development of gifted students

Component	Characteristic roots	% of Variance	Cumulative %
1.	11.394	27.129	27.129
2.	4.878	11.615	38.744
3.	2.518	5.995	44.739
4.	2.036	4.848	49.588
5.	1.941	4.621	54.209

The 5 most prominent features (factors) of an environment that encourages the development of gifted students were extracted by applying the Gutman-Kaiser criterion. Factors with a characteristic root greater than 1 that together explain more than 50% of the total variance were singled out (54.209%) (Table 4).



Graph 1. Scree plot test

Graphical representation of these factors expressed by the Scree Plot Test is shown in Graph 1. The most pronounced fracture is after the third, but also the fifth factor, so the prevailing understanding is about the selection of five factors according to the Gutmann-Kaiser criterion.

As the Graph 1 and Table 3 show, the factor value decreases from the fifth to the eleventh factor, after which the value decreasing trend is even more evident, which is why other factors were not analysed in relation to the variables in question in the later part of the study. The following features of a supportive environment for the development of giftedness were singled out: 1) *differentiated curricula*, 2) *encouraging problem-based learning*, 3) *integrated approach to learning*, 4) *encouraging research-based approach to learning*, and 5) *developing logical and creative thinking skills*. The results presented show that teachers believe that a supportive environment

for the development of giftedness is primarily characterized by differentiated curricula. Therefore, the emphasis is on differentiation and individualization based on individual student's characteristics, and on giftedness type and level of each individual student. In addition to the differentiated curriculum as a prerequisite for a supportive environment, teachers also emphasize the importance of problem-based learning, as well as an integrated and research-based approach to learning. Teachers believe that the five most important features of a supportive environment for the development of giftedness also include logical and creative thinking skills. From the perspective of the knowledge society, it is these characteristics of an educational environment that provide gifted people with the opportunity to develop their intellectual and creative capacities which they will successfully use to participate in and improve the knowledge society.

Furthermore, the teachers also believe that the following features also serve as features of a supportive environment for the development of giftedness: proper instruction materials and technical and organizational requirements, the use of diverse didactic and methodological tools, the availability and use of various sources of knowledge and stimulating learning materials, flexibility in lesson planning, and supporting team work in school and during extracurricular activities. However, although these are considered to be important features of an environment that has a stimulating effect on the development and improvement of giftedness, these elements are considered less significant than the ones initially listed above.

The analysis of the results from the aspect of the variables used shows that the teachers' attitudes on certain features of an environment that encourages the development of giftedness in the learning society vary with the schooling level (age of students) and the school location. Teachers' opinions in which a statistically significant difference was found regarding the characteristics of an encouraging environment in terms of the variables school location and schooling level (age of students) are shown in Table 5. As Table 5 shows, there is a statistically significant difference in the opinions of teachers with regard to five characteristics of an environment supportive of the development of giftedness, which are as follows: differentiated curricula, encouraging problem-based learning, integrated approach to learning, encouraging research-based approach to learning, developing logical and creative thinking skills. From the aspect of independent variables, it is evident that there is a statistically significant difference in opinions of teachers in relation to the schooling level, that is, the age of the students whom they teach, in all of the abovementioned characteristics of an encouraging environment. High school teachers emphasize almost all of these qualities

Table 5. Teachers' attitudes on the features of an environment that encourages the development of giftedness in relation to school location and schooling level (age of students)

The characteristics of an encouraging environment	Variables	M	SD	t-test	df	p
Differentiated curricula	Primary school	3.7	1.0	.382	104	.004
	High school	3.6	1.4			
	Nis	3.8	1.1	1.270		.012
	KM	3.5	1.4			
Encouraging problem-based learning	Primary school	2.6	0.7	-3.670	104	.000
	High school	3.4	1.2			
	Nis	3.1	1.1	.467		.802
	KM	3.0	1.1			
Integrated approach to learning	Primary school	2.9	1.0	-3.848	104	.025
	High school	3.8	1.3			
	Nis	3.3	1.2	-.501		.044
	KM	3.5	1.4			
Encouraging research-based approach to learning	Primary school	3.1	1.7	-1.831	104	.014
	High school	3.6	1.4			
	Nis	3.5	1.5	.501		.171
	KM	3.3	1.6			
Developing logical and creative thinking skills	Primary school	3.1	1.8	-2.055	104	.001
	High school	3.8	1.5			
	Nis	3.6	1.6	.761		.093
	KM	3.4	1.8			

more often than primary school teachers. This can be attributed to the fact that high school teachers are in a slightly different position compared to primary school teachers because they work with students who have already been identified as gifted, thus obtaining a clear picture of the students' giftedness, their capabilities and needs. On the other hand, primary school teachers pay considerable attention to the proper identification of giftedness and, from this perspective, look somewhat differently at the characteristics of a supportive environment.

No significant differences were found with respect to the school location, as was the case with the schooling level. With regard to the school location, teachers' opinions differ in relation to differentiated curricula and the integrated approach to learning, as the features of an environment encouraging the development of giftedness. Since, on the one hand, these are fundamentally different regions, and on the other hand, the differences identified are not consistent (consistency found only in relation to the two features, where in one case the teachers from Nis had more positive opin-

ions, and in the other case it was their colleagues from Kosovska Mitrovica), we believe that school location is not the determining factor to approach this issue differently. The difference identified might perhaps be attributed to the differences in the teachers' skills to recognize these qualities as important for creating an encouraging environment for the development of giftedness in a knowledge society.

DISCUSSION

The concept of *the learning society* actually implies *lifelong learning*, that is, preparation for a life in which people must "...equip themselves with useful knowledge" (Savicevic 2000: 11). As a necessity but also a consequence of the modern age, of the constant evolving changes and fast development, both lifelong learning and the learning society require a vastly different approach to individual's education. A learning society is a knowledge society, and it primarily focuses on providing learning opportunities for everyone, especially gifted students. Since a knowledge society values self-education, such gifted students are given ample opportunity to meet educational needs and develop their highest potentials. In this respect, it is important to provide motivation, that is, encouraging environment for their optimum development. The foundation of lifelong learning includes 4 types of learning: learning to know, learning to do, learning to live together and learning to be (Cros 2007). In this context, the education of gifted students and the promotion of their development largely depends on teachers and their new roles, in line with the innovations being introduced into education systems around the world. These roles expand, and the teachers become diagnosticians, therapists, planners, programmers, coordinators, etc. However, in order to successfully meet the objectives that are set before them, they need to constantly educate and improve themselves, that is, to be part of a learning society, and that includes: "culture of innovation, innovation and knowledge evaluation, collaborative and multidimensional innovation processes, learning as the crucial value of the knowledge society, diversity of learning, knowledge assessment, culture of learning..." (The UNESCO World Report: Towards Knowledge Societies 2007). A well-organized professional development of teachers should be: stimulating, functionally linked to changes occurring in the education system, complex and systematic. It provides training for various professional roles, for planning, implementing and evaluating their work, as well as for inclusion in the lifelong learning process. Only in this way can teachers help gifted students to fit into the world of change and development, to consciously, reasonably and critically act and create, to become moral, working,

sensible, and creative individuals. Teacher is the person who “...best creates and guides the overall classroom climate to stimulate creative ideas in students” (Maksic 2006: 150). The concept of the knowledge society implies a more open approach to local institutions, which provides gifted students with opportunities to better acquire knowledge, develop skills and habits, collaborate with institutions related to their interests “libraries, museums, theatres, recreation centres, work organizations, mass media” (Savicevic 1983: 8). According to Djordjevic and Maksic, as an institution vital to the development and advancement of gifted students, school should provide the opportunities and a climate for creative work, select learning materials that will encourage the growth in students’ intelligence, encourage children to ask questions and expand their ideas, encourage group work and flexibility in curricula (2005).

In order to enjoy learning and to achieve satisfactory learning results, it would be wise to align teachers, their environment, and the learning styles of their students. The curriculum should be designed so that each gifted student can learn at their own pace, to the extent of their ability, interest and learning style. It should be improved and made to enable the actual use of the lessons learned, but also to ensure the development of giftedness through extracurricular activities. Therefore, when encouraging the development of giftedness, it is important to provide necessary instruction materials, to meet the technical and organizational requirements, to provide the diverse didactic and methodological tools, to make the instruction materials and knowledge sources available, to develop proper methods and techniques that can meet the needs of gifted students, to encourage logical and critical thinking, as well as teamwork in regular school and extracurricular activities, to foster the integrated and exploratory approach in working with gifted students, as well as to ensure the conditions for the development of creativity.

CONCLUSION

At the beginning of the 21st century, giftedness is considered a social need and it is a crucial concept in the development of education of all the international, relevant institutions. Teaching students to use critical and logical thinking, to properly use sources of knowledge, and to conduct research are the main features and needs of a learning society. A knowledge society, which relies on continuing education, provides a wide range of opportunities to meet the needs, interests and potentials of all, especially gifted students. By analysing the research findings and comparing them with related, relevant theoretical studies, it could be concluded that teachers who work

with gifted children in Serbia recognize the importance and role of an encouraging environment for the development of giftedness. From the aspect of knowledge society, it is encouraging to notice that the characteristics of an environment that the teachers believed to be relevant are precisely those that only develop giftedness, but also allow gifted students to further develop through: the research-based approach to learning, problem-based learning, integrated approach to learning, logical and creative learning skills, individualization and differentiation of teaching. These values observed should be nurtured and used in the classroom, but also further enhanced through pedagogical, didactic and methodological improvement of teachers who would thus become able to improve and qualitatively enhance their educational and teaching environment, making it even more stimulating and encouraging for the development of giftedness.

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PODSTICAJNO OKRUŽENJE ZA RAZVOJ NADARENIH UČENIKA U DRUŠTVU ZNANJA

Sažetak:

Cilj našeg rada je da se teorijsko-empirijskom analizom utvrdi značaj podsticajnog okruženja za razvoj i napredak nadarenih učenika u savremenom društvu znanja. Da bi se obezbedio najviši nivo reprezentativnosti uzoraka, istraživanje je sprovedeno na uzorku od 106 nastavnika koji rade u specijalizovanim odeljenjima za nadarene učenike u srednjoj školi i nastavnika koji su sa tim učenicima radili u njihovim prethodnim fazama školovanja. Studija je sprovedena u školama sa područja grada Niša i Kosovske Mitrovice (Republika Srbija)*, a korišćenjem tehnike skaliranja. Faktorskom analizom izdvojeno je sledećih 5 najznačajnijih karakteristika (faktora) okruženja koje podstiče razvoj nadarenih učenika u društvu znanja: 1) diferencirani kurikulum, 2) podrška učenju zasnovanom na problemima, 3) integrisani pristup učenju, 4) podrška pristupu zasnovan na istraživanju i 5) razvoj logičkog i veštine kreativnog razmišljanja. Ovo istraživanje je takođe otkrilo da nivo školovanja nadarenih učenika značajno određuje razlike u percepciji nastavnika o karakteristikama sredine koja podstiče razvoj nadarenih učenika, dok lokacija škole nije odlučujući faktor.

ključne reči: diferencirani nastavni plan i program; raznovrsni izvori znanja; podsticanje darovitosti; društvo koje uči; nastavni proces

Adrese autora
Author's address

Vesna Minić
University in Pristina – Kosovska Mitrovica
Teacher Education Faculty, Kosovska Mitrovica
vesna.minic@pr.ac.rs

Marija Jovanović
University in Nis
Faculty of Philosophy, Nis
marija.jovanovic@filfak.ni.ac.rs

Živorad Milenović
University in Pristina – Kosovska Mitrovica
Teacher Education Faculty, Kosovska Mitrovica
zivorad.milenovic@pr.ac.rs

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