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GIFTED STUDENTS IN A REGULAR PRIMARY-SCHOOL CHEMISTRY CLASSROOM IN ŠUMADIJA DISTRICT (SERBIA) – OPPORTUNITIES AND MEETING THE NEEDS FOR FURTHER DEVELOPMENT

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ABSTRACT

Gifted students have a range of unique abilities interwoven with the higher levels of creativity and motivation that differentiates them from the most peers in their distinctive learning and understanding abilities. In order for gifted students to fully develop their abilities, the teaching environment must be tailored to meet their special needs by implementing higher-order cognitive tasks in learning activities, so that the lack of challenge and boredom doesn't trigger some negative outcomes in the terms of disinterest, becoming disengaged and unmotivated, which ultimately leads to unfulfillment of student's potentials and underachieving (Taber, 2015). In Šumadija district gifted children have the opportunity to enroll in regular schools or be grouped in specialized classrooms by abilities (chemistry/biology; physics; mathematics; informatics). Also, gifted students can participate in a various afterschool activities intended for high-achieving and gifted students, such as Regional Centre for Talented – Kragujevac, workshops organized by Faculty of Science – Kragujevac and Petnica Science Centre – Valjevo. The main goal of this paper is to examine the position of gifted students in chemistry in our district and to evaluate real circumstances and opportunities that are presented to students through our educational system.

Keywords: Gifted students, chemistry, development of gifted students.

INTRODUCTION

The development of modern society couldn't be imagined without individuals who are able to generate new ideas, apply them, as well as to explore various possible solutions and implement them in order to resolve problems of ever-growing hi-tech industry. The creativity in problem solving strategies, as well as possession of highly developed divergent thinking processes represents some of the most desirable qualities in contemporary work force. Therefore, the proper education of gifted children, as a future driving force of modern civilization, should be imperative for any success-oriented community, as gifted children express characteristics like those detected in successful entrepreneurial individuals (Shavnina, 2012).

It is well known that gifted learners possess higher levels of abilities, intelligence and achievement, which are very often not used fully as regular classroom activities are designed for students with average abilities. Also, learning activities that do not offer a gifted learner sufficient challenge can damage the students' motivation to study, and lead to boredom (Phillips, & Lindsay 2006; Gallagher et al., 1997) and even frustration (Keating, & Stanley, 1972) and disengagement (Kanevsky, & Keighley, 2003) with school classes. Consequently, very often gifted children do not develop to their full potential.

Chemistry as a subject has a great potential to meet the needs of gifted students for cognitive challenges as it abounds in a variety of problem-solving activities. In an all-inclusive classroom, on the teacher lies great responsibility to organize proper learning environment which is very often filled with many obstacles reflected in overpopulated classrooms, lack of properly equipped laboratories and unappreciation of teachers' additional effort and commitment.

The main goal of this study is to examine the position of gifted students in science (in particular, chemistry) in our district and to evaluate real circumstances and opportunities that are presented to students through our educational system.

MATERIALS AND METHODS

General background

The research was conducted during the Decembre of the year 2022. The study included 8th grade students from primary schools in the territory of the city of Kragujevac (Serbia) who were denoted as potentially gifted in chemistry. The territory of the city of Kragujevac covers 22 primary schools and all of them were invited to participate in this research.

Sampling

All students included in the research sample (N=26) were 8th grade (age 13-14) primary school high-achieving students (both female and male). The homogeneous purposive sampling was done by their chemistry teachers from all twenty-two primary schools from the territory of the city of Kragujevac (Serbia), based on students' engagements in the classes, achievements, grades, participation in various science competitions (mostly chemistry, biology, and physics) and science camps (Petnica Science Centre and similar). Also, all students were characterized by their teachers as potentially gifted but were not tested for.

Instrument and procedures

The instrument (questionnaire) was designed to assess the opportunities that gifted children in science related subjects (with the accent on chemistry) have for development of their talent within the framework of Serbian educational system. Results collected in the questionnaire represented students' attitudes, beliefs, and self-beliefs regarding their opportunities and activities in which they were involved. The questionnaire was composed of multiple-choice and open-ended questions. Statistical tests (median, mean value, and standard deviation) were conducted for the analysis and interpretation of data (McCrum-Gardner, 2008). Detailed statistics are given in percentages. In-depth analyses of the collected data were undertaken in order to gain insight into its content, followed by the extraction of key meanings and grouping of information into conceptual categories that lead to the making of categories into themes through constant comparison of data (Charmaz, 2006).

RESULTS AND DISCUSSION

The opportunities for development that gifted children for natural sciences have in Serbia are well structured through the education system and properly supported through the regular public schools. The whole system relies on proper identification of gifted children by their teachers and family members. Once the child is identified as gifted it can attend selected classes through Individual Educational Plan (IEP) tailored specifically to the needs and abilities of a given child. IEP is suggested by the teacher and must be consented by the parents. The plan is created and its progress is monitored by a professional team (subject teacher, psychologist, pedagogist etc.). The child can benefit the most from the IEP, because its cognitive, social and emotional needs are met to the fullest as the student represents the main focus during the educational process. Sadly, our research has shown that no child from this study had IEP. The reason for this can be south in the fact that main responsibility, the body of work and engagement lays on the teachers, who are reluctant to take on themselves accountability for its implementation, as it would represent for them additional assignment, along with other obligations that overpopulated inclusive classroom represents.

In a regular classroom teachers can support gifted students through implementation of active learning principles and by grouping high achieving students in Additional classes which are organized as afterschool activities under the umbrella of the school. In the study the children denoted Physics (64%) as the main subject where they have the opportunities to be involved in various forms of active learning models intended for gifted children, while Geography and

Informatics were denoted with 0% (Figure 1). Children denoted the Project Base Learning as the most used method in science classes. Also, Geography was appointed as the only subject that had no Additional classes for high achieving students.

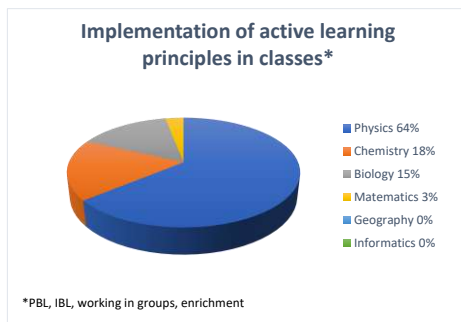


Figure 1. Graphical presentation (given in percentage (%)) of the presence of the active learning principals in classes of the natural sciences per subject.

The study has shown that children participate in all science competitions at all levels. The teachers were marked as the ones who helped them the most in preparing for competitions.

In the instrument, the group of questions was designed to determine what afterschool activities children attend that are not connected to the once that school offers. Most children attend sports and foreign language. From all art-associated activities, playing the musical instrument is the most favorable. The data are presented in Figure 2.

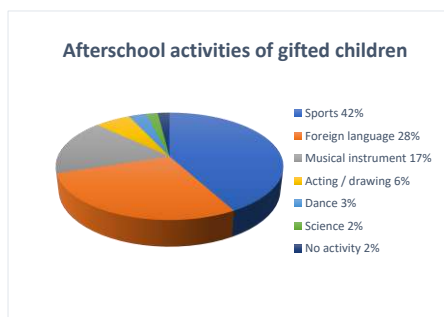


Figure 2. Graphical presentation (given in percentage (%)) of the type of afterschool activities of gifted children.

As motivation represents a crucial driving force behind human behavior it was of interest to determine whether the motivation for student's attendance of afterschool activities was internally or externally motivated. The data are presented in Figure 3. Students were mostly internally motivated, while only 10% was externally. In most cases, children denoted foreign languages as the most externally motivated activity (Foreign language 85%, Sports 10% and Musical instrument 5%).

The Serbian educational system enables gifted students from Šumadija district (and others) to attend several science camps, workshops organized by Faculty of Science – Kragujevac, become a member of the Regional Centre for Talented – Kragujevac, and Petnica Science Centre – Valjevo. Although children are very often familiar with the existence of these organizations they are not informed how and if they can enroll and are not getting the proper guidance from their science teachers. The exception were the students from the First Kragujevac's Gymnasium which has specialized classrooms for talented children. The survey has shown that children were mostly informed on existence of afterschool science related activities from their peers and relatives and that teachers are most willing to suggest the activities that can have a positive impact on their career (science competitions).

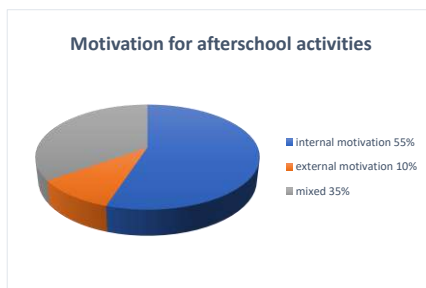


Figure 3. Graphical presentation (given in percentage (%)) of students' motivation for afterschool activities.

CONCLUSIONS

Although in Šumadija district gifted children for natural sciences have many possibilities to improve their knowledge and develop their talent to full potential, children are generally uninformed and not getting the proper guidance from their science teachers, apart from the First Kragujevac's Gymnasium which has specialized classrooms for talented children. The survey has shown that children were mostly informed on existence of afterschool science related activities from their peers and relatives and that teachers are most willing to suggest the activities that can have a positive impact on their career. From the data presented in the pies it can be seen that the children are mainly internally motivated for afterschool activities and that children usually choose sports, foreign languages and music as activities, with science falling under 2%. The children denoted Physics (64%) as the main subject where they have the opportunities to be involved in various forms of active learning models intended for gifted children, while Geography and Informatics were denoted with 0%.

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