

Original paper

Katarina Z. Marinković

Primary school “Vojislav Voka Savić“, Lazarevac, Serbia

Olivera J. Đokić¹

University of Belgrade, Teacher Education Faculty



doi: 10.5937/inovacije1602038M

Paper received: April 1st 2016

Paper accepted: Jun 28th 2016

Article Published: July 15th 2016

Strategies of Work of Teachers with Potentially Gifted Students for Mathematics, Experience of the USA, Russia, Japan, China, Romania and Serbia

Extended summary

This research is on the strategies of work with potentially gifted children for mathematics in several states which choice can be justified by cultural differences and success of their students at international testing. This is the way how strategies of work in the USA, Russia, Japan, China, Romania and Serbia are discussed. The aim of the paper refers to representing strategies of work with students who are potentially gifted for mathematics in the stated countries and determining attitudes of teachers in Serbia about the ways of work with potentially gifted students with mathematics in regular classes.

In the research, we have used descriptive method, and the teachers where interviewed by the questionnaire. For the purpose of the research there was a questionnaire created with 10 questions. The sample has the character of simple random sample and it consists of 70 teachers from Belgrade and the outskirts. Teachers were divided into two groups: the first group was the one who attended some seminars for professional development which was about potentially gifted children for mathematics and there were 29 of them (41.50 %) and the second group of teachers did not attend any kind of seminar for professional development for training with this group of students, and there were 41 (58.50%).

There is a question of the ways of identifying potentially gifted students and 28-trained teachers (96.55%) have the attitude that potentially gifted students exceeded in comparison to other students in the class and 37 untrained teachers (90.24%) do not have this attitude. Only four untrained teachers have the attitude that they do not identify this sort of students (9.76%). Only one trained teacher (3.45%) has the attitude that the school psychologist should identify these students.

¹ olivera.djokic@uf.bg.ac.rs

In the paper, half of the teachers, 35 of them (50.00%), apply individual form of work. In this group, there are nine trained teachers (31.03%), and much more untrained, 26 of them (63.41%). Individual work is often combined with other forms of work. Trained teachers have the attitude that they should combine individual form of work with pair work, and those are seven of them (24.14%), and rarely group work, there are five of them (17.24%). Situation is reversed with untrained teachers, they more often combine individual with group work, there are four of them (9.76%), and frontal form of work, there are three of them (7.32%). When we combine several forms of work, there are eight trained teachers who use them (27.58%), and there is a smaller number of untrained, only three of them (7.32%). Teachers of both groups agreed that differentiated type of teaching as a sort of teaching, potentially gifted students are enabled to develop, among which there are 45 of them (64.28%). Nevertheless, there are less trained teachers who have this attitude, 17 of them (58.62%), in comparison to untrained; there are 28 of them (68.29%). Trained teachers think that differentiated teaching as a system is not sufficient for developing students' potentials, 12 of them (41.38%), and there are less untrained teachers who have this attitude, 10 of them (24.39%). Three of untrained teachers (7.32%) have the attitude that differentiated teaching as a teaching system as a teaching system does not enable development of students' potentials.

Regular cooperation of teachers with suitable centres, which work with potentially gifted students for mathematics, is present in greater extent with the trained teachers, 26 of them (89.66%), and they cooperate far less with special institutions, 18 of them (43.90%). Twenty-three (56.10%) untrained teachers have no kind of cooperation. If we take into account both groups, 44 teachers (62, 86%) cooperate with suitable institutions, and even 26 (37.14%) have no kind of cooperation. According to this, we cannot confirm that teachers cooperate with those institutions in Serbia. This is why we have asked a research question if there is a dependence or association between attending seminar for professional development by teachers and cooperation of teachers and special institutions. We have used hi-square and we have come to conclusion that there is significant association between attending seminar for professional development by teachers and cooperation of teachers and special institutions, i.e., $c=0.52$, $p=0.000$. The obtained value of correlation coefficient is approximately high (high values indicating a stronger association between these two variables).

Respondents who gave the reply "YES" and the other "NO" were in accordance. Thirty-seven of them did not attend professional seminars, and they cooperate with special institutions for work with potentially gifted students and seventeen of them attended professional seminars and do not cooperate with special institutions.

Both group of teachers, consisting of 66 people who gave replies (total number of 70), and out of these 41 teachers cooperates with respondent institutions (62.12%), and twenty-five (37.88%) do not cooperate.

A great number of teachers from both groups can be motivated to work with potentially gifted – twenty-one trained teacher (72.41%) and twenty untrained (48.78%). Surprising number of untrained teachers have the attitude that they might be motivated, almost one half, twenty of them (48.78%), almost one quarter of them, the seven of them (24.14%).

When we talk about innovative course books and their use in work with potentially gifted students for mathematics in regular classes, almost one half of the teachers individually prepares material and uses particularly made materials, 22 of them (48.88%), and a smaller number uses course books or talks of the open type for work with potentially gifted students, twenty of them (44.44%). It is similar with untrained teachers.

Based on the given results, we can say that teachers mostly do “free identification” of potentially gifted students, i.e. without using special methods and procedures. Results show that in regular teaching, teachers use individual form of work in combination with some other, and very often differentiated teaching as a teaching system in combination with some other, and mostly they individually prepare those tasks, and in this way they approach the needs of students of different abilities, including those potentially gifted. Course books with resource packs are not sufficient support for working with potentially gifted students for mathematics in regular classes. This state may differ if innovative course books have the component of differentiated in approach. Most of the teachers are motivated for attending seminars so that they can get acquainted with work strategies which would offer additional knowledge about work with this group of children, but material means and insufficiency of time frame them.

These are the descriptors of making conditions for developing potentially gifted students in regular mathematics classes, within which a teacher should, developed the skill of leading teaching. Anyway, there are problems in work with this group of students. Based upon the given results, we can see that great number of teachers do not have any kind of cooperation with work with potentially gifted children for mathematics, particularly exchanging experience and information between teachers, so we opened questions for further research.

Key words: potentially gifted students for mathematics, strategies of the teachers’ work syllabi for potentially gifted students for mathematics, Serbia.

References

- Blažič, M., Stanojević, D. (2014). Teachers’ understanding of giftedness. *Godišnjak Učiteljskog fakulteta u Vranju*, 5, 87–100. DOI: 10.5937/gufv1405087B.
- Dejić, M., Mihajlović, A. (2014). *Matematička darovitost*. Beograd: Učiteljski fakultet.
- Dejić, M., Čebić, S. (2011). Strategije rada sa matematički darovitom decom u svetu i kod nas. U: Gojkov, G. i Mihač, L. (ur.). *Zbornik 16 – Daroviti u procesu globalizacije* (142–159). Međunarodni naučni skup *Daroviti u procesu globalizacije*, 28. juni 2011. Vršac: Visoka škola strukovnih studija za obrazovanje vaspitača „Mihailo Pavlov“, Arad: Universitatea de vest „Aurel Vlaicu“.
- Dejić, M., Milinković, J., Đokić, O. (2007). Kako jednostavno dijagnostikovati matematičke sposobnosti učenika. U: Gojkov, G. (ur.). *Zbornik 13 – Praktični aspekti savremenih shvatanja darovitosti* (74–84). Međunarodni naučni skup *Praktični aspekti savremenih shvatanja darovitosti*, 12. juli 2007. Vršac: Visoka škola strukovnih studija za obrazovanje vaspitača „Mihailo Pavlov“.

-
- Diezmann, C. M. & Watters, J. J. (2000). An enrichment philosophy and strategy for empowering young gifted children to become autonomous learners. *Gifted and Talented International*. 15 (1), 6–18.
 - Đokić, O. (2014). Diferencijacija kao strukturna komponenta inovativnog modela udžbenika matematike. U: Nikolić, R. (ur.). *Nastava i učenje* (543–553). Međunarodni naučni skup *Nastava i učenje – savremeni pristupi i perspektive*, 7. novembar 2014. Užice: Učiteljski fakultet.
 - Fan, L. (2014). *Investigating the pedagogy of mathematics: how do teachers develop their knowledge*. London, GB: Imperial College Press.
 - Fujii, T. (2015). Designing and adapting tasks in the Japanese lesson study: focusing on the role of the quasi-variable. In: Novotná, J. & Moraová, H. (Eds.). *Developing mathematical language and reasoning* (9–18). International Symposium Elementary Mathematics Teaching SEMT-2015, 16–21. August 2015. Prague: Charles University, Faculty of Education.
 - Johanson, D. T. (2000). *Teaching Mathematics to Gifted Students in a Mixed-Ability Classroom*. Retrived December 1, 2015 from www: http://www.davidsongifted.org/db/Articles_id_10515.aspx.
 - Karnes, F. A. & Stephens, K. R. (2009). Gifted Education and Legal Issues. In: Shavinina, L.V. (Ed.). *International Handbook on Giftedness* (1327–1341). Canada, Quebec: Springer. DOI: 10.1007/978-1-4020-6162-2_70.
 - *Katalog programa stalnog stručnog usavršavanja nastavnika, vaspitača i stručnih saradnika za školsku 2014/2015 i 2015/2016*. (2014). Zavod za unapređivanje obrazovanja i vaspitanja.
 - Maksić, S. (2014). Darovito dete. U: *Leksikon obrazovnih termina* (129–130). Beograd: Učiteljski fakultet.
 - Mamiy, D. (2008). *On Training Mathematically Gifted Students within Regional Educational Framework*. Retrived December 1, 2015 from www: tsg.icme11.org/document/get/580.
 - Maričić, S. M., Milinković, N. (2015). Diferencirana nastava i učenici potencijalno daroviti za matematiku. U: Mihajlović, A. (ur.). *Metodički aspekti nastave matematike III* (61–74). Treći međunarodni naučni skup *Metodički aspekti nastave matematike*, 14–15. juni 2014. Jagodina: Fakultet pedagoških nauka.
 - Maričić, S., Špijunović, K. (2013). Identifikacija učenika potencijalno darovitih za matematiku u mlađim razredima osnovne škole. U: Nikolić, R. (ur.). *Nastava i učenje* (221–236). Međunarodni naučni skup *Nastava i učenje – kvalitet vaspitno-obrazovnog procesa*, 8. novembar 2013. Užice: Učiteljski fakultet.
 - Marinković, K. (2016). *Pregled istraživanja o strategijama rada učitelja sa potencijalno darovitim učenicima za matematiku* (master rad). Beograd: Učiteljski fakultet.
 - Milinković, N. (2014). Didaktičke vrednosti diferencirane nastave u radu sa učenicima potencijalno darovitim za matematiku. U: Nikolić, R. (ur.). *Nastava i učenje* (569–580). Međunarodni naučni skup *Nastava i učenje – savremeni pristupi i perspektive*, 7. novembar 2014. Užice: Učiteljski fakultet.

-
- Mullis, I. V. S., Martin, M. O., Foy, P. & Arora, A. (2012). *TIMSS 2011 International Results in Mathematics: International study*. Retrived December 1, 2015 from www: http://timssandpirls.bc.edu/timss2011/downloads/T11_IR_Mathematics_FullBook.pdf.
 - OECD (2014). *PISA 2012 Results in Focus, What 15-year-olds know and what they can do with what they know*. Retrived December 1, 2015 from www: <http://www.oecd.org/pisa/key-findings/pisa-2012-results-overview.pdf>.
 - Petrović, D., Kuzmanović, D., Jošić, S., Jovanović, V. (2015). Obuhvat, dostupnost i trajanje stručnog usavršavanja nastavnika u Srbiji. U: Radišić, J. i Buđevac, N. (ur.). *Sekundarne analize istraživačkih nalaza u svetlu novih politika obrazovanja (9–27)*. Nacionalni naučni skup *Sekundarne analize istraživačkih nalaza u svetlu novih politika obrazovanja*, 8. april 2015. Beograd: Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije i Društvo istraživača u obrazovanju u Srbiji.
 - Phillipson, S. N. & Callingham, R. (2009). Understanding Mathematical Giftedness: Integrating Self, Action Repertoires and the Environment. In: Shavinina, L. V. (Ed.). *International Handbook on Giftedness (671–725)*. Canada, Quebec: Springer. DOI: 10.1007/978-1-4020-6162-2_33.
 - Pjanić, K. (2014). The Origins and Products of Japanese Lesson Study. *Inovacije u nastavi*, 27 (3), 83–91. DOI: 10.5937/inovacije1403083P.
 - Rachmel, S. & Leikin, R. (2009). Education of Gifted Students in Israel: General and Mathematics Education. *Gifted Education Press Quarterly*, 23 (1), 6–9.
 - Singer, F. M., Sheffield, L. J., Freiman, V. & Brandl, M. (2016). Research On and Activities For Mathematically Gifted Students. In: Kaiser, G. (Ed.), Part of the series ICME-13 Topical Surveys (1-41). Hamburg: Springer. doi: 10.1007/978-3-319-39450-3_1.
 - Teodorović, J. D., Milin, V. D., Vujačić, M. B. (2016). Programi stručnog usavršavanja nastavnika: procenjena korisnost i obrazovni efekti. *Inovacije u nastavi*. 29 (1), 46–59. DOI: 10.5937/inovacije1601046T.
 - Ueda, A., Baba, T. & Matsuura, T. (2014). Values in Japanese Mathematics Education from the Perspective of Open-ended Approach. *Inovacije u nastavi*. 27 (3), 69–79. doi:10.5937/inovacije1403069U