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## Inclusive values in the planning of Mathematical issues at an early age

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In accordance with the general principles of the present inclusion in advanced education systems, which are based on the support of children with special educational needs and their inclusion in regular teaching process along with their peers, inclusive values are gradually becoming a reality in the Montenegrin educational process. The paper aims to show the importance of inclusive teaching of mathematics as a starting resource for planning and implementation of mathematical concepts at an early age, which is of great importance for the development of intellectual and other abilities of a child. Research was conducted in preschool institutions in Montenegro. The most significant parameters related to the respondents were their level of education and years of teaching experience and working with children with special education needs, which serve as indicator of understanding of inclusive values in the educational process at an early age. Respondents expressed problems in practice and proposed measures to overcome them. To provide reliable and objective results, the research covers a representative sample of 550 respondents.

**Keywords:** child with special needs; development at the early age; inclusive value; kindergarten teacher; mathematical terms and issues; planning and realisation

### Introduction

Consistent with the tendencies of development of inclusive education in the developed countries of the world, Montenegro is also facing challenges in this area while striving for more efficient strategies for the purpose of continuous improvement of the educational system and ensuring a democratic environment in which difference and diversity work in synergy. These challenges are related to the training of teachers to work with children with special needs, adapting curriculum to their abilities, adapting physical environment to suit their stay, expansion of inclusive awareness in the society, and creating a legal foundation of inclusive education at all age levels. Montenegrin educational system accepts inclusive education as one of the guiding principles of modern education systems and on this basis to improve teaching practice. It is clear how important implementation of the guiding principle is for crucial aspects of the successful preparation of all stakeholders. Striving for more efficient model of inclusive education and its harmonisation with the developed world standards, one of the necessary preconditions is the training of teachers for the full implementation of these objectives. The importance of Mathematics at an early age is crucial. Intense physical and mental development at an early age greatly contributes to the future development of the cognitive abilities of a personality. This age is characterised by spontaneity and naturalness as common features. Regardless of individual differences, children are prepared to communicate with each other, and seek out common interests through the games, which have educational character. Montenegro has accepted the inclusion as the set of basic principles of educational work. It is to “contribute to the development of children by providing the conditions and incentives for the development of their skills and personality traits that enrich their experience and build knowledge about themselves and other people in the world” (Milić, 2010:56–57). According to this principle, children with special needs belong to their generation and have the right to be included in the regular programme of work from an early age.

Economically speaking, the concept of inclusive education has its justification. It takes much less material resources to invest in inclusive education than is required in the system of separate specialised institutions. Children with special needs are included in regular educational process in the local community where they live. The mere fact that children with disabilities are not separated from their families and placed in special homes, that there is no organisation of special classes, and that children are not treated in isolation from peers provide enormous economic benefits for the concept of inclusive education. If we add the future of the children who are, from the earliest days, included in the peer group, it becomes clear how much everyone benefits from the integration process. Being a member of the group of peers, a child with special needs goes through the easiest and fastest adoption of the processes of numerous mathematical concepts from the environment. In communication with peers, through playing games, they acquire the concepts of spatial relations, size of objects and spatial dimensions, sets, numbers, temporal relations, etc. For all these to be acquired in isolated and special context, it would be necessary to invest much more physical, human, educational and other resources, and the effects would probably be much smaller.

Along with a more profound and fundamental scientific understanding and appreciation of developmental specificity of children/students in modern pedagogical and psychological theory and practice, certain tendencies in changing the perspective from which we deal with the problems of education in the broadest sense, tend to occur simultaneously:

- Tendency towards a holistic approach - shifting the focus from the difficulties that the child has to his or her personality in general, where every child with a disability is seen as a particularly unique being, while organic and functional impairment are recognised to be the part of the child's personality as a whole (Hrnjica, 2009);
- Tendency to appreciate diversity, i.e. accepting challenge as a natural diversity not as a problem;
- Tendency towards the ecological approach - shifting the focus of interest from the perception of the child as a problem to the overcoming of barriers that the child encounters in different spheres of life (family, educational institutions etc.) (Žikić, 2008: 41).

#### The Inclusion of the Disabled Children in the Educational System in Montenegro

Initial teaching of basic mathematic terms is an integral part of the current educational curriculum in Montenegro, and represents a set of specific topics and goals, developed in accordance with the capabilities of the children. Therefore, it is of special importance to pay attention to the method, procedure and efficiency of transferring the underlying objectives in this area to children. Applying differentiated methodological procedures and individualised approach in working with children, kindergarten teachers allow for the accessibility of content in mathematics to the whole group, which includes those who need additional support.

Milić has noted that "...in modern pedagogical and psychological theory and teaching practices the presence of a demand for individually tailored learning process is evident" (trans.) (2002: 27). Of course, adjusting and leveling mathematic terms for all children implies the differentiation of requirements within the existing curriculum, not the exclusion of children with special needs (children with physical, mental and sensory disabilities and children with combined disabilities) in a special group gathered around another programme (Mićanović, 2012). This also means that it is possible to layer and adapt current educational objectives and contents to the capabilities of different children, and create individual education plans, if necessary, even within a common national curriculum.

Ilić-Stošović has meanwhile noted that "[t]he development and construction of individual training programs [*sic*] for each segment of teaching in which the child participates allows harmonious development of the child, according to their ability" (2011:72). Inclusion of children with special needs in the educational process is functional only if there exist respect and affirmation of their potentials – not inabilities – and if they are integral part of the group/community. It is often evident that these children suffer from the lack of sufficient attention, and as a result there are many activities lacking which, objectively speaking, might be able to be implemented (Šakotić, 2009:14).

The role of the kindergarten teachers is to apply and vary appropriate methodological procedures, so that he or she could adjust the contents to the diversity of the classroom community. In such a climate within a group, the children stay in the classroom with their peers all the time, and the kindergarten teacher assesses whether it is necessary and to what extent it is necessary to individualise requirements. However, in a situation where they cannot follow the goals of the programme and actively take part in a class activity, the kindergarten teacher must individualise activities and differentiate requirements in accordance with the differing potential amongst individual children. Daniels and Stafford have noted that "it is extremely important that these children are placed in the correct position", and that one takes care of the regular and careful change in activities, in order to have them concentrated on the work (2002:241).

In the process of a child-centered teaching, individualised learning is of the greatest importance, while teacher's thoughtful planning guarantees that each child can participate in regular activities (Rothschild & Daniels, 2002:14). This approach involves teaching children according to a completely different approach from that of the traditional teacher (Slunjski, 2006:29).

A methodical approach to the activities aimed at the development of functional thinking of children of a certain age should be based on the real possibilities that these children possess. Taking into consideration their real possibilities we plan and create activities, which contribute to their comprehensive cognitive development. Learning for children is motivated from within, often provoked by a cognitive conflict (Ćebić, 2010:22; Meintjes & Grosser, 2010). In such activities, specific exercises that develop the coordination of mental and physical (moving) sphere should be inevitable. So the children of early age behave like explorers, they frequently ask questions, putting together the parts of the exercise and discovering new things, having all forms of intellectual activities represented in such processes. Finding practical solutions to numerous problem situations ensure the development of functional thinking, which can be manifested in many ways, but the key to success is the involvement of mental power, in its fullness (Green, Condy & Chigona, 2012).

Activities that directly promote the development of functional thinking should be implemented not only in kindergarten, but also in the family. The need for such activities is based on modern concepts of a more complete development of personality. This is not a matter of a forceful, linear hastening of the development process (acceleration), but providing/enriching conditions to encourage integrated development (amplification). Children at an early age should be given more

attention, and educators should put them in as many activities in which they would manipulate various play materials through exchanges with peers and adults (Rossouw, 2009). By posing different types of questions to students, teachers and parents provoke different levels of thinking (Steel & Temple, 2000:85). These are good strategies, methods and procedures at an early age, by which children learn the proper skills to establish connections and relationships between components in a problem situation, that is when they develop functional thinking abilities. Specifically, in the process of development of functional thinking, beside the formation of certain thinking “techniques” (viz. the ability to master fixed operations and procedures), children need to be enabled to discover new connections and general practices/procedures that enable solving new problem situations and learning new skills and knowledge. Failure to resolve problem situations is caused by the chosen strategy/procedure of perceiving challenges. Kostić, in his *Cognitive Psychology*, singled out the most important factors for the successful resolution of problems: functional fixity, that is concentration on a single function of the object, the (in)ability to analyse a situation from another perspective, the impact of cognitive orientation, and the neglect of essential elements of the problem (Kostić, 2010:398). According to Havelka (2008:38), external expression of progress in building concepts becomes apparent in a gradual improving of problem-solving abilities.

Therefore, supporting the progress of the child with special needs in the initial teaching of mathematics ought to be based on the willingness of kindergarten teachers to:

- accept and support a child with special needs in their group;
- plan and implement individualised activities in the educational process in an appropriate manner, taking into account the needs and interests of each child to the extent possible;
- continuously support children with special needs to develop their maximum potential;
- continuously cooperate with parents and team for monitoring and support of the children with special needs;
- encourage the social affirmation of children with special needs in the classroom;
- set clear and realistic goals derived from a common curriculum in the field of mathematics; and
- evaluate their contribution to the progress of the children with special needs.

Children with special educational needs in the education system of Montenegro are included in the regular activities, so as to develop their mathematical skills by solving adapted problems. Markov has noted that the truth is that our society was dominated by the prejudices about persons with special educational needs, completely ignoring such persons for such a long time. (2008:149–150).

### Methodological Concept of the Research

In the course of our research on inclusive values in the planning of mathematical activities at an early age, we focused on educators from the field of early childhood education in Montenegro. A significant part of the research subject related to the determination of the level qualification and competences of teachers for inclusive education.

The research problem was focused on determining the current state of the education system of Montenegro, referring to early mathematics teaching and inclusion of children with special educational needs in the education process. The main problem of the research in this paper was to determine the current situation regarding the appropriate application of inclusive principles in the initial teaching of mathematics in kindergartens, with children with special needs. For the purposes of this research, we chose to use a questionnaire with multiple choice and open-ended questions, as well as a scale of assessment, in order to gain a more objective sense of the nature of the problem. The aim of this study was to gather as much relevant information about the current state of the system in terms of professional and overall preparedness of the kindergarten teachers to work with children with special needs in the area of initial teaching in the field of mathematics as possible. Finally, the goal of this research is to identify the key problems in the process of implementation of inclusive principles in teaching mathematics. Based on the collected research indicators, it is possible to accurately mark the key recommendations to improve inclusive practices in the field of mathematics in future.

### Sample

The sample included 550 kindergarten teachers. This is a quota and a convenience sample. Thus, the random sampling method was chosen for respondents from the three regions in Montenegro (North, Central and South), with the intention to include representatives of all representative regions in our country (quota sample). Within these three groups were randomly chosen volunteer participants (convenience sample).

### Instrument

For the purposes of the research, we used a questionnaire and an estimate scale. Questions in it were defined in accordance with the given issue and included information about: the region in which they were employed, years of experience, level of expertise, the modes of planning implementation of mathematical objectives, current problems in teaching practice and proposed measures to improve existing inclusive context in teaching mathematics at an early age. The scale for assessing the attitudes toward inclusive values in the field of integration of children with special needs in the teaching of mathematics in the kinder-

gartens was designed by the authors of this study, with the main aim to assess the applicability of inclusive standards in the initial teaching of mathematics (i.e. adaptation of goals and activities, creation of individual programmes etc.). It is in the form of the summation Likert-type scale, and the respondents for each statement expresses the degree of agreement. The discriminative power of each item of the scale was examined on the basis of correlation between item-total, with 16 separate items.

Reliability of the scale was determined using Cronbach's alpha coefficient, obtained by identifying the internal consistency of the scale. The reliability of the scale is satisfactory, because the value of the said coefficient is 0.755.

#### Process of Research and Presentation of the Research Results

The authors were involved in the research process. Respondents were guaranteed anonymity of the data obtained from questionnaires and scales that would be filled. In this way, we reduced the possibility of receiving more "desirable" answers. Data was collected in the period from the beginning of February to the end of June 2015. All three researchers were in touch with all respondents in the process of collecting data in order to competently explain the research process and provide necessary clarification if needed. After the research was completed, they conducted an objective analysis and determined the prevalence of specific indicators of inclusive values in the planning and implementation of mathematical activities at an early age.

This paper presents the frequencies and percentages, as well as mean and standard deviation, as statistical indicators of variables, based on which we can clearly observe models of good

practice and note the problem that hinders or call into question the quality of the implementation of the inclusive model of education work in planning and realisation of mathematical activities at an early age. Quantitative indicators were complemented by the descriptive analysis of studied problems and respondents' answers in order to objectify the picture of the studied phenomenon in pre-school practice.

#### Results of the Research

In order to analyse the problem our sample respondents came from all cities and towns of Montenegro, featuring different levels of experience and qualifications (550 persons).

The sample covered 183 respondents with a college degree, which represents 33.27% of the total sample, and 367 respondents with a university degree or 66.72% of the sample (Table 1). Teachers with a college degree generally belong to the category of respondents with working experience ranging from 31–40 years, although some of them belong to the category of 21–30 years of age. Heterogeneity of the sample, in terms of education, was important for the distribution of answers to the key questions pertaining to the inclusion of children with special needs in the initial teaching of mathematics.

In addition to professional qualifications, the sample was also heterogeneous in terms of the years of experience (Table 2). Without any particular intention, we included 143 respondents, whose length of service is in the range from 0 to 10 years, which makes 26% of the total sample, 238 respondents (43.27%) were in service from 11 to 20 years, 95 subjects (17.27%) had working experience ranging from 21 to 30 years, and 74 respondents or 13.45% of the sample had 31 to 40 years of working experience.

**Table 1** Level of education of the kindergarten teachers

Level of education	Frequency	Percent
College degree	183	33.27
University degree	367	66.72
Total	550	100.0

**Table 2** Years of working experience of the kindergarten teachers

Years of working experience	Frequency	Valid percent
0–10	143	26.0
11–20	238	43.27
21–30	95	17.27
31–40	74	13.45
Total	550	100.0

**Table 3** Education level of the kindergarten teachers and their assessment of the quality of inclusion in preschool education system of Montenegro

Teachers in kindergarten	Quality	Mostly quality	Mostly not quality	Not quality	Total
College degree	0 0.0%	36 19.67%	54 29.5%	93 50.81%	183 100.0%
University degree	0 0.0%	94 25.61%	223 60.76%	50 13.62%	367 100.0%
Total	0 0.0%	130 23.63%	227 50.36%	143 26.0%	550 100.0%

Note.  $\chi^2 = 28.226$ ;  $df = 4$ ; C. Coeff. = 0.354;  $p = 0.001$ .

Based on the data obtained, we can determine that when it comes to the assessment of the quality of inclusive education in Montenegro, as perceived by kindergarten teachers with different level of qualification, there is a tendency in the respondents with college degree to rate it as not quality when compared to the responses of their colleagues holding university degrees (93 respondents or 50.81%) (Table 3), who hold the predominant view that the inclusive education is mostly not of high quality. Interestingly, none of the respondents were of the opinion that inclusive education in Montenegro is of high quality (223 respondents or 60.76%). The distribution of responses by region (Table 3) shows a statistically significant difference

( $\chi^2 (4) = 28.226$ ; C. Coeff. = 0.354;  $p < .01$ ) regarding the attitude toward the quality of inclusive education in Montenegro. The noted statistical significance in terms of different results in the field of assessing the quality of inclusive education across regions leads us to determining the reasons for such attitudes. We have selected three key factors, namely kindergarten teachers: a) do not have the support they need from the system; b) are not equally trained to work with children with special needs; or c) are not given the same chances for professional development to work with children with special needs in their kindergarten groups.

**Table 4** Working experience of respondents and estimation of the quality of inclusive practices regarding the inclusion of children with special needs in mathematical activities in kindergarten

Years of working experience in kindergarten	Quality	Mostly quality	Mostly not quality	Not quality	Total
0–10	0 0.0%	73 51.04%	55 38.46%	15 10.48%	143 100.0%
11–20	0 0.0%	125 52.52%	97 40.75%	16 6.72%	238 100.0%
21–30	0 0.0%	15 15.78%	53 55.78%	27 28.42%	95 100.0%
31–40	0 0.0%	3 4.05%	28 37.83%	43 58.1%	74 100.0%
Total	0 0.0%	170 30.9%	279 50.72%	101 18.36%	550 100.0%

Note.  $\chi^2 = 58.324$ ;  $df = 4$ ; C. Coeff. = 0.435;  $p = 0.001$ .

Interestingly, none of the kindergarten teachers, regardless of their experience, assessed inclusive education as a quality one in terms of involving children with special needs (Table 4). Teachers with the longest working experience (43 respondents or 58.1%) expressed their dissatisfaction to a much greater extent when compared to their counterparts with less work experience when it comes to the active participation of children with special needs in the initial teaching of Mathematics. Categories of respondents with work experience ranging from 21 to 30 years (53 respondents or 55.78%), predominantly hold the view that the kindergarten teachers are generally not well prepared and trained to work with children with special needs in mathematics, making the inclusive practice inefficient at this level; while respondents with the least experience, from 11 to 20 years (125

respondents or 52.52%), as well as those with 0 to 10 years of working experience (73 or 51.04%), regard the inclusive practice as being generally a quality one (Table 4), with a marked statistically significant difference ( $\chi^2 (6) = 58.324$ ; C. Coeff. = 0.435;  $p < .01$ ) in the attitudes of respondents by the category of experience. This can be explained by the fact that the initial training of kindergarten teachers was in line with modern social developments, and that state continuously innovated educational programmes. It is also understandable that teachers who received their education 30 or 40 years ago did not have sufficient training to work with children with special needs. Specifically, newly designed curricula of the study programmes for kindergarten teacher education, include activities in the domain of inclusion, and the entire educational/social context of the reform process affirms this principle, so it is understandable why

kindergarten teachers with the least number of years of employment have the best opinion about the quality of inclusive practice in the mentioned area.

On the sample differentiated by qualification (Table 5) in two categories (college and university degrees), we found significant differences in attitude about the quality of inclusive practice in the initial teaching of mathematical terms and issues. A much higher percentage of respondents with a college degree (98 respondents or 53.55%) believe that initial kindergarten teacher education is not of high quality, in terms of preparation for working with children with special needs in the area of mathematics at an early age, compared to the responses from those with a university degree (three respondents or 0.81%), while respondents with the university degree, estimate that initial teacher education generally is not particularly good in this respect. It is also interesting to note that much higher percentage of respondents with a university degree (41.68%) are of the opinion that the inclusive practice is generally a quality one,

compared to those holding a college degree (9.28%). Taking into consideration the observed significant differences in the attitudes of the respondents ( $\chi^2 (2) = 36.288$ ; C. Coeff. = 0.436;  $p < .01$ ), it is clear that the level of education influences the respondents' assessment of the quality of inclusion of children with special needs in mathematical activities in kindergartens. While respondents from both categories hold a fairly critical stance when it comes to the quality of inclusive practice in terms of the level of preparation for working with children with special needs in kindergarten, particularly in mathematic terms, we can see that teachers with a university education express a much higher level of satisfaction with the quality of higher education in preparing future teachers to deal with the focused problem, since in the course of their education, they had a chance to get some basic knowledge in the field of inclusive education, and especially in the field of methodology of teaching mathematics at an early age.

**Table 5** Level of education of educators and their assessment of the quality of inclusive practices regarding the inclusion of children with special needs in mathematical activities in kindergartens

Education College teachers in kindergarten	Quality	Mostly quality	Mostly not quality	Not quality	Total
College degree	0 0.0%	17 9.28%	68 37.15%	98 53.55%	183 100.0%
University degree	0 0.0%	153 41.68%	211 57.49%	3 0.81%	367 100.0%
Total	0 0.0%	170 30.9%	279 50.72%	101 18.46 %	550 100.0%

Note.  $\chi^2 = 36.288$ ;  $df = 2$ ; C. Coeff. = 0.436;  $p = 0.001$ .

**Table 6** Working and training experience of respondents when it comes to working with children with special needs on implementation of mathematical activities in the kindergarten

Years of working experience of teachers in kindergarten	Fully trained	Mostly trained	Mostly not trained	Not trained at all	Total
0–10	0 0.0%	83 58.04%	39 27.27%	21 14.68%	143 100.0%
11–20	0 0.0%	141 59.24%	37 15.54%	60 25.21%	238 100.0%
21–30	0 0.0%	27 28.42%	30 31.57%	38 40.0%	95 100.0%
31–40	0 0.0%	13 17.56%	21 28.37%	40 54.05%	74 100.0%
Total	0 0.0%	264 48.0%	127 23.09%	159 28.9 %	550 100.0%

Note.  $\chi^2 = 28.342$ ;  $df = 6$ ; C. Coeff. = 0.334;  $p = 0.001$ .

In terms of kindergarten teachers' expertise to work with children in the field of mathematics, we noticed the most significant difference in the number of years of service, while in the category of regions and qualifications, we have not noticed any significant difference (Table 6). It should be noted that the categories of respondents with work experience up to 10 years (83 respondents or 58.04%) and 11–20 years (141 respondents or 59.24%) dominantly hold the attitude that they are

generally qualified to work with children with special needs in the subject of mathematics. Unlike them, respondents with more work experience i.e. 21–30 years (38 respondents or 40%) and 31–40 years (40 respondents or 54.05%) of work in kindergartens were of the opinion that in general they are not qualified to work with children with special needs, when teaching mathematic terms and issues (determined statistical significance in the analysis of responses was  $\chi^2 (6) = 28.342$ ; C. Coeff.

= 0.334;  $p < .01$ ). Such attitudes of the respondents point to the need for proper organisation of retraining and professional development of kindergarten teachers in the field of working with children with special needs. It is interesting that none of the respondents felt fully competent and qualified to work with children who need to have a customised programme and methods in the process of instruction in the field of mathematics in the first cycle of primary school. Therefore, a logical con-

sequence is a need for planning and realisation of extensive kindergarten teacher training in all kindergartens in all regions of Montenegro.

In order to assess the key inclusive values in planning/realisation activities in the initial teaching of mathematics, we used a total of 16 items, and each item was assessed with a five-degree assessment scale (5 - strongly agree, 4 - mostly agree, 3 - both I agree and disagree, 2 - mostly disagree, 1 - completely disagree).

**Table 7** Mean values of items that assess the recognition of important inclusive values in planning/realisation activities in the implementation of mathematical activity in the kindergarten

	<i>N</i>	Arithmetic mean	Standard deviation
While planning prescribed curriculum objectives teacher differentiates their implementation according to children abilities in the kindergarten.	550	3.36	.692
Preparation of annual, monthly and weekly plans of the implementation of teaching objectives is based on previous familiarising with abilities of the children.	550	3.27	.731
Kindergarten offers all the expertise in the field of planning and realisation of teaching objectives in accordance with the requirements of inclusive education to its kindergarten teachers.	550	1.86	.764
Kindergarten teachers are competent to apply inclusive approach in the planning and realisation of activities.	550	2.96	.681
Kindergarten teachers use inclusive approach in their work to the fullest extent.	550	3.41	.792
The realisation of the initial teaching of mathematics is fully inclusive in the preschool institution where I work.	550	2.11	.564
Always involve children with special needs in math activities in a kindergarten.	550	4.72	.893
The kindergarten teacher ensures that children without disabilities cooperate with children with special needs, both in learning and extracurricular activities.	550	3.46	.786
The kindergarten teacher applies methods and forms of work that enhance inclusion in his/her work.	550	3.24	.734
The number of children in an inclusive classroom is optimal and allows smooth process of individualisation and differentiation.	550	1.05	.654
When it comes to children with special needs in teaching of mathematics, kindergarten teacher always uses individualised approach to teaching.	550	3.15	.765
The kindergarten teacher always differentiates courses and course requirements in teaching mathematics.	550	3.07	.824
The kindergarten teacher has excellent cooperation with the expert team for inclusive education at the kindergarten.	550	4.38	.885
The kindergarten enhances the professional competence of kindergarten teachers through professional development programmes, which it provides on a yearly basis.	550	2.31	.796
Central institutions elaborate the programmes of professional development of kindergarten teachers for teaching mathematical terms in a kindergarten according to inclusive requirements.	550	2.88	.687
If the kindergarten teacher is not able to solve any problem when working with children with special needs, he/she always seeks the advice and assistance of the relevant services, and they do not ignore the problem, but work on it until it is resolved.	550	3.56	.834

From the given display of the mean values (Table 7) of the assessment of the recognition of important inclusive values in planning/realisation activities in the initial teaching of mathematics, we ought to consider the highest and lowest values. The highest mean values can be seen on items, which state that “always involve children with special needs in math activities in the kindergarten” (4.72) and the “kindergarten teacher has excellent cooperation with the expert team for inclusive education at a kindergarten” (4.38) while contrary to them, the lowest average values are reported on

the items such as “the number of children in an inclusive classroom is optimal and allows smooth process of individualisation and differentiation” (1.05) and “kindergarten offers all the expertise in the field of planning and realisation of teaching objectives in accordance with the requirements of inclusive education to its kindergarten teachers” (1.86).

As for the open-ended questions in the questionnaire, in order to highlight what represents the biggest problem in working with children with special needs in mathematics, and what they

propose as measures to improve the situation, kindergarten teachers predominantly highlighted the following problems: lack of professional and methodical support of the institution, where there is: underdeveloped professional competence in working with children with special needs in kindergarten; too many children in educational groups in kindergarten; and lack of necessary teaching materials for children with special needs in kindergarten. Proposed measures to improve inclusive practice in kindergarten as proposed by teachers include: the accreditation of quality programmes for professional development regarding the inclusion of children with special needs in math activities in preschool, provision of adequate teaching equipment, and resources for the work, reducing the number of children in educational groups in kindergarten in order to quality individualised and differentiated educational work.

#### **Discussion about the Results of the Research and Recommendations**

The research revealed that inclusion came to life at an early age (kindergarten), but there are many problems regarding its implementation. It is encouraging that a growing number of educators were prepared to accept the concept of inclusive planning and implementation of mathematical activity in pre-school education. In this process it is particularly important that all parties work on the implementation of inclusive programmes and cooperate with each other as partners, providing mutual collaboration and support (Mićanović, 2010). It is much more rational to use the resources for the education of the existing teaching staff than to spend it on a special education system for children with special needs. By linking institutions in the inclusive education process, we network both human and professional resources, which interact and contribute to upgrading the individual professional skills of teachers. Particularly important are mutual trust, respect, and appreciation, because without these, there is no quality provision of help to those who really need it.

It is incomprehensible that kindergarten teachers have to work with 30 children, especially when having a child with special needs among them, trying to meet everyone's needs. Taking into account a number of relevant psychological and pedagogical factors of successful mathematical work with pre-school children, it is desirable, from the point of a kindergarten teacher whose class features a child with developmental disabilities, to work with a maximum of 10 children. In cases when there is a child with moderate developmental problems, this number should not exceed 15 children in a group. In case of less severe forms of inclusion, the number of children per group should not be more than 20. Working in numerous groups

leads to neglecting the individuality of the child and meeting their needs, which at the same time calls into question the quality and sustainability of the process of inclusion. Since the laws in Montenegro put the principles of inclusion, democratisation and individualisation on a high level, it would be realistic to expect practical application of inclusive education at all levels of education, and in all programmes of professional development of kindergarten teachers, so that planning operational goals would foster active involvement of children of different levels of knowledge and capabilities in the process of the teaching of mathematic issues at an early age. In order to effectively plan and implement the adoption of mathematical concepts in children of different predispositions in inclusive kindergarten teaching, it is essential to have immediate expertise in the field of mathematics, but it is of fundamental importance to possess the knowledge of key assumptions of an inclusive paradigm.

Since children with special needs are part of the total population, they have the right to be provided with adequate early education, just as well as their peers do. Institutions should be equally open and responsive to all children. The results show significant progress regarding the spread of ideas of inclusion in the educational process, since its complete implementation requires full cooperation of all social and educational institutions.

The methodology used to assess the value of planning and implementation of designed mathematical activities at a very early age has helped us to identify problems and suggest measures for improvement:

- ensuring continuous process of development for all educators regardless of working experience and level of education;
- providing more objective approach to the development and application of criteria for the formation of groups and number of children;
- teamwork in planning and implementation;
- full access to State institutions; and
- providing the necessary teaching materials for apparent activity.

#### **Conclusion**

Based on a research related to the issues of inclusive education in Montenegro's pre-school context, we explored the achievements, challenges and recommendations for the development of this model in present educational and social environment. The teachers, as key drivers of the pedagogical process at an early age, assessed the quality and the level of responsiveness of the current pre-school environment to the specific and special needs of children with disabilities/developmental challenges in the area of mathematical activity. As can be seen from the results, the differences between respondents in

terms of their perception of the quality of support and methodological skills in the work, especially in the field of mathematical contents with children with disability/developmental challenges, do exist, especially from the aspect of the level of education, as one of the criteria variables. It is evident from the answers of all respondents, that is, surveyed teachers, that it is necessary to ensure of the respect of key pedagogical norms in regard to the number of children per class and the number of required professionals, who need to build a quality and responsive environment for children with disabilities in kindergartens. A systemic-teamwork approach, as one of the constituent components of the Montenegrin educational system, implies a number of contradictions in practice. Namely, in contrast to the preferred declarative model of systemic and continuous reform and adjustment of programmes, which intend to cater for all contextual and individual differences, the implicit beliefs of educational policy makers and a number of the direct participants in the given context, continue to rely on the model of exclusion and a segmented approach. Architectural barriers and inadequate spatial resources, and resulting conditions lead to visible communication barriers both in the narrower and broader pedagogical context. Therefore, pre-school educators in general expect adequate professional support in order to improve their educational procedures and meet the programme objectives in the field of mathematics, to advance their skills of individualisation when it comes to methodological work, and to make more effective contribution to various stakeholders' team working with children with disabilities/challenges. Whenever the professional competence of teachers is thoroughly grounded and built, there is more determination, motivation and dedication to research in educators willing to improve the current practice in all-important segments.

#### Note

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