ACTA DIDACTICA NAPOCENSIA
Volume 11, Number 2, 2018

PRIMARY SCHOOL TEACHERS' OPINION ON MATHEMATICAL APTITUDES OF STUDENTS

Ioana Magdaş, Claudia Alexandrina Sale

Abstract: To carry out the study underlying the article we started from the following hypotheses: H1. Curricular mathematical documents in Romania aim at developing the mathematical aptitudes of pupils in primary education; and H2. Teachers systematically pursue the development of mathematical aptitudes of pupils in primary education. For this, we developed an on-line questionnaire. The purpose of the questionnaire was to collect information based on the experience of primary school teachers on the knowledge and assessment of the mathematical aptitudes of 4th grade pupils. In this paper, we present the results obtained by applying, centralizing and analyzing the data gathered following the completion of the questionnaire by the teachers for primary education.

Key words: primary school, teachers, mathematical aptitude, Romania.

1. Introduction

The term "aptitude" comes from Latin, from the word aptus, meaning "good for ..." "capable of ...". According to Al. Roşca (1976), aptitudes represent stable psychic and physical attributes that allow a person to successfully perform certain forms of activity. According to Cronbach (1967, p. 23) aptitude is "a complex of personal characteristics that accounts for an individual's end state after a particular educational treatment, i.e., that determines what he learns, how much he learns, or how rapidly he learns". Cronbach (1967, p. 24) also hypothesized that aptitude "may have as much to do with styles of thought and personality variables as with the abilities covered in conventional tests".

Aptitudes are based on some native individual provisions. For aptitudes to form and develop, it is necessary to engage an intense activity in the field. Aptitudes can develop because of a persistent study and acquiring vast and systematic knowledge about that activity. Theories of school learning generally recognize ability or aptitude as an influence on learning or achievement (Carroll, 1963; Walberg, 1981-apud. Reynolods and Kamphaus, 2003). As viewed by Cronbach (1967, p. 27) "we haven't the faintest evidence, for example, what constitutes mathematical aptitude, save for the obvious fact that a person who has mastered one mathematical fact or process has an advantage in learning the next process in a hierarchy."

Aptitude is the attribute that: differentiates people in the ability to achieve superior performance, effectively contributes to the successful accomplishment of activities, assures the accomplishment of the activity at a higher quality level, disposes in a constellation with a certain configuration and with a high degree of operability. Aptitude is a psychic attribute that satisfy three requirements: to be individual and differentiating, to effectively ensure the purpose of the activity, to have a high degree of operational and efficiency. It has superior qualitative forms: talent and genius. (https://biblioteca.regielive.ro/cursuri/psihologie/psihodiagnoza-aptitudinilor-si-inteligentei-135082.html).

Mathematical aptitude is a relatively independent personality substructure, which has cognitive, affective-motivational and volitional components, and which, as it is constituted, facilitates the achievement of school and professional performance in mathematics, superior to the average of those of the same age of persons with similar schooling (Berar, 1991). Skills are based on hereditary prerequisites (included in the genetic equipment of the individual). These prerequisites, under the

Received: 27 June 2018, accepted 9 July 2018.

Cite as: Magdaş, I; & Sale, C. A. (2018 Primary School Teachers' Opinion on Mathematical Aptitudes of Students. *Acta Didactica Napocensia*, 11(2), 11-26, DOI: 10.24193/adn.11.2.2.

influence of the environment and through the activity of the subject, turn into the proper skills on which performances depend in different fields of activity (Roşca, 1976, p. 473; Cosmovici, 2004, p. 70).

Mathematical aptitude involves the ability to understand, immediately or after a short period of time, the general structure of a problem, a synthetic type, global orientation in the problem, abstraction power, spatial imagination, spatial correlation and arithmetic (Ruthe, 1931; Krutetki, 1968; Skemp, 1971; Beraru, etc.) (apud. Zlate, 2009, p.260).

The efficiency of the process of structuring mathematical aptitude depends on (Roşca, Zörgö, 1972): the degree of development of mental functions (analysis, synthesis, generalization, abstraction, concentration capacity); the type of person's contact with mathematics (active or passive) and the methods of mathematical education; motivational factors such as interest, aspirations, perseverance of the person; emotional factors (for example, it is known that the anxieties created by the teacher can inhibit the mathematical aptitude structure). According to H. Thomas (1985) "Talent searches identifying mathematically able junior high school youth have shown, on a number of summary statistics, remarkably consistent sex differences on mathematical aptitude test scores".

Studies conducted (Kruteţki ş.a., apud Zörgö, Radu, 1979) reveal as elements of mathematical aptitude: ability to generalize rapidly and extensively the mathematical material; discover, from a given case or by comparing many relationships, a soving way applicable to other similar situations; quickly finding data organization rules or an algorithm; ability to quickly condensate a reasoning or a series of judgments and operations; flexibility of thinking, restructuring of information, find of more solutions to a given problem, fast transition from direct reason to the opposite, formation of reversible associations (direct and inverse associations); ability to see and represent geometrical figures and spatial relationships; combine and separate geometrical figures; ability to symbolize, use notations; attraction to the problematic situations.

According to I. Berar (1991) there are 8 components of mathematical aptitudes, namely:

1. Ability to memorize mathematical data, relationships, and mathematical operations
2. Mathematical thinking
3. Attention
4. Ability of appropriate orientation in the given task
5. Ability to generalize in the sphere of mathematical objects and mathematical relations
6. Ability to perceive, represent and operate with figures and spatial relationships
7. Flexibility of cognitive processes
8. Logical-mathematical experience

From the earliest contacts with figures, with arithmetic/mathematics, we find that some students demonstrate rapidity, ease in solving mathematical tasks, problems, numerical manipulation and geometric figures, proving mathematical logic. About these students, we could say they have developed mathematical skills. If we are to analyze a situation, namely a problem with a great difficulty solved by students during a math class, we can see that several students solve the problem, some solving it quickly, without help, and others slower and with little support. Can we include them all as having mathematical skills?

Based on these considerations, we intend to identify the opinion of primary school teachers about mathematical skills of students. For this, we developed an on-line questionnaire. In this paper, we present the results obtained by applying, centralizing and analyzing the data gathered following the completion of the questionnaire by the teachers for primary education.

2. Research description

2.1. Period of research

The research was carried out in March 2018.

2.2. Procedure

The research is based on a questionnaire developed by Google Forms, which was sent and completed online. Respondents answered voluntarily and anonymously.

The questionnaire can be accessed at:

https://docs.google.com/forms/d/12Wv5fPiXmHH3MHZYDTsSDVYFC2SdkBObj6UiWWcSg-Y/edit .

2.3. Sample of respondents

The questionnaire was addressed to primary school teachers.

2.4. Survey's goal

The purpose of the questionnaire was to collect information based on the experience of primary school teachers taskon the knowledge and assessment of the mathematical skills of 4th grade students.

2.5. Research hypothesis

In our study we started from the following hypothesis:

H1. Curricular mathematical documents in Romania aim at developing the mathematical aptitudes of pupils in primary education;

H2. Teachers systematically pursue the development of mathematical skills of pupils in primary education

The independent variable of the research consists of a questionnaire on the opinion of primary school teachers about mathematical skills of students.

The dependent research variable refers to the importance given to the development of mathematical aptitudes of pupils in primary education by teachers, and curricular documents.

2.6. Survey content

For our study, 17 items of questionnaire were selected. 3 of them were demographic items and 14 items on mathematical aptitudes in primary school with reference to school curriculum, schoolbook, components of mathematical aptitudes and the importance of assessment. Among items on mathematical aptitudes 7 of them have multiple-choice questions, in 4 of them, the choice was made on a Likert scale with 5 values: "not at all", "little", "medium", "much" and "very much and 3 items were open-ended. For the calculation of some averages the five values on the Likert scale were converted into scores on a scale of 0 to 10 pt. as follows: none = 0 pt; a little = 2.5 pt; average = 5 pt; much = 7.5 pt .; and very much = 10 pt. The collected data has been statistically processed and represented in diagrams using the Excel spreadsheet editor.

3. Results and discussions

3.1. Demographic items

The sample of subjects consisted of 70 primary school teachers. In terms of teaching experience, 17,1% have under 5 years of teaching experience, 12.9% between 5-10 years, 10% between 10-15 years, 14.3% between 15-20 years, 27.1 % between 20-30 years and category between 30-40 years category represents 18.6%. Regarding the training 10% are debutants, 11.4% are definitive teachers, 15.7% have the second degree, while 62.9% have the first degree. 61.7% of respondents have a Bachelor's degree while 25% of them have a Master's degree.

From these demographic data, we find that the sample of respondents is one who has sufficient training and didactic experience to express their opinion on the topic approached in the questionnaire.

3.2. Teacher's opinion on how curricular documents respond to individual and age needs of students

Concerning the difficulty of the 4th grade mathematics curriculum, for middle level students, teachers' opinions are almost equally divided. 48.5% of the teachers consider the math curriculum for the 4th grade to be difficult or very difficult for middle level students, while the other 51.4% of teachers consider it easy or having an average level of difficulty. We do not know whether those who consider the school curriculum for the 4th grade to be difficult work in a disadvantaged environment and refer to: students who have learning difficulties, to rural students who are less likely to attend school or to pupils from disadvantaged backgrounds (the gypsies).

In order to find out the teachers' opinion on the extent to which the schoolbook is adapted to the age and individual peculiarities of the students, three indicators were taken into account: The general development level of children aged 10-11; Categories of pupils (weak, good, medium, very good); The needs of personal development of gifted pupils. 75.7%, 60%, and 57.2% of teachers, respectively, consider that the schoolbook is appropriate to an average, high or very high level of general development of children aged 10-11 years; categories of pupils (weak, good, medium, very good) and the needs of personal development of gifted pupils. It is noted that 5.7% of the respondents "do not know" to what extent the manual is adapted to the age and individual peculiarities of the pupils in the 4th grade, which leads us to the fact that, unfortunately, they do not know the peculiarities of age and individual pupils. By calculating the average for each component (fig. 1) we find that it is below 5 pt. (of a maximum of 10 possible), which shows that teachers believe that the manual is not even adapted to an average level for the age and individual peculiarities of pupils.

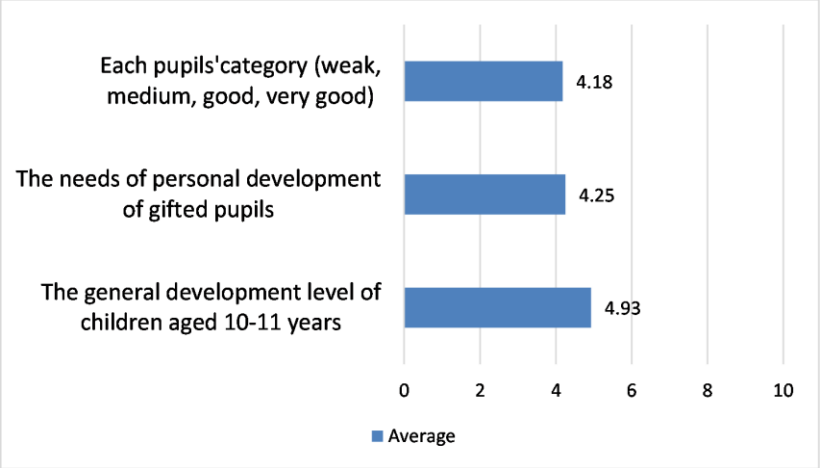

Figure 1. *The average with which the schoolbook is adapted to the age and individual peculiarities of students*

3.3. Teacher's opinion on the characteristics of pupils with mathematical aptitudes and their importance

We wanted to find out what is the teachers' opinion about the characteristics of students with mathematical aptitudes. Of the 70 answers, 36 of them which represent 51.42%, use the word "thinking" using syntaxes such as "rapidity in thinking", "logical-mathematical thinking", "logical reasoning and abstract thinking", "critical thinking and its operations, analysis, synthesis, generalization, abstraction are developed". 28.57% (20 people) assert that students with mathematical aptitudes solve easily and quickly both mathematical calculations, exercises, and mathematical problems. They also find easy solutions to problems, compose problems and find the solution, look for new methods to achieve results, schematize, follow algorithms, and easily focus on tasks. 10% assert that these students are intelligent and stop here with the assertions, and another 10% assert that students with mathematical aptitudes are orderly, attentive, receptive, hardworking and courageous.

Mathematical aptitudes can be demonstrated in competitions, according to 25.7% of the teachers. 32.8% of teachers think that math aptitudes are demonstrated in everyday life, in current activities, games ("Hopscotch", "Do not mind brother"), in household and shopping. We consider these teachers only summarize the pupils' mathematical knowledge, especially counted, as in the case of games, and their use does not justify the demonstration of mathematical aptitudes. Matematical operations as addition, subtraction, division, multiplication we really use in everyday life, shopping, games, but they do not show that we have developed mathematical aptitudes. Also, 32.8% of teachers say that mathematical aptitudes are used in other disciplines (Romanian language, Biology, Sports, Geography). No concrete examples have been given, so we can not say it is true or false. For example, if a Romanian child counts the lyrics of a poem, we can not say that the child has developed mathematical skills.

3.4. Teacher's opinion on developing math skills through schoolbooks and training activities

100% of teachers believe mathematical aptitudes of students can be developed through appropriate training strategies.

Regarding the role of the schoolbook, respectively the training activities (made by teachers) in the development of the mathematical aptitudes (see fig. 2), it is noted that over 75% of teachers believe that the tasks of the fourth grade schoolbook contribute at most at an average level to the development of mathematical aptitudes, while over 77% of the teachers, through their training activities, follow much and very much the development of mathematical skills. The average for the schoolbook is 5.125, while the average for teachers' work is 7.325. Analyzing these data, we can conclude that, in addition to the schoolbook, teachers use auxiliaries or other materials (worksheets, set of problems etc.) that are focused more on mathematical aptitudes' development.

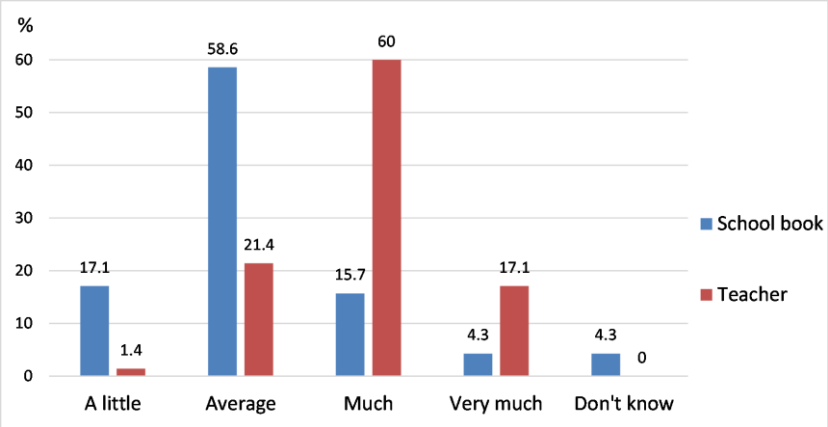

Figure 2. *Percents with which the tasks from schoolbook or given by teachers contribute to the development of mathematical aptitudes*

To find out how much training activities are focused on the development of students' mathematical aptitudes, a list was given to teachers (see Appendix), without specifying they are subcomponents of mathematical aptitudes. At each subcomponent respondents must give a value on a five values Likert scale. These subcomponents are part of the eight components of mathematical skills (Berar, 1991). In table 1 we made a centralization for these 8 components, which we will analize next.

1. *Ability to memorize mathematical data, relationships, and operations*

Table 1 shows that over 25% of teachers give a little importance to memorizing, while 70% of them assign it an average importance. This is a good fact because teachers realize that mathematics is not based on memory but on thinking. The average of this component is also the smallest of all. However, we also observe that 8.6% of teachers insist very much on memorizing in math activities. The only subcomponent that has received a score over 8 is the ability to perform mathematical calculations. Over 87% of teachers give a much or very much importance to the ability of students to perform mathematical calculations. Mathematical calculus is one of the most important mathematical skills.

2. Mathematical thinking

Regarding the ability to solve typical work tasks, the opinions are divided: 42.9% of the teachers give an average importance while 57.2% give a much or very much importance to it. It is remarkable that 87.1% of the teachers give a much or very much importance on students' ability to perform mathematical calculations.

3. Attention

There are only 4.2% of teachers who give a little importance on the ability to solve typical mathematical tasks requiring little change in the solution / approach, instead 55.7% of teachers who

give it much or very much importance. This is a gratifying fact because these problems are the first step in developing flexible thinking.

4. Adequate guidance in the given task

Almost three-quarters of the teachers, 74.3%, give a much or very much importance on adequate orientation in complex work tasks (developing thinking), while only 5.7% give a much or very much importance on solving problems with a higher degree of difficulty (developing creativity). The approach is not wrong because problems with a high degree of difficulty are addressed only to students capable of superior performance, while complex work tasks develop the ability to structure information that must be developed for all students.

5. Ability to generalize in the sphere of objects and mathematical relations

72.9% of teachers are concerned about developing this capacity, which is very good, especially since it is difficult to do such activities at a young school age.

6. Ability to perceive, represent and operate with figures and spatial relationships

More than three-quarters of the teachers, 77.2%, are focused on: data schematic writing, ability to solve a problem by several methods, to compose problems and to solve a problem through the figurative method. The percentage of 7.1% of teachers doing only a few of these activities makes us wonder how these teachers carry out their activities, because the schematic writing of problem data is an indispensable step in solving any math problem. The explanation may come from the fact that these teachers solve a small number of problems, with the emphasis on mathematical calculation.

7. Flexibility of cognitive processes

All three subcomponents of the flexibility of thinking are much or very much followed by over 70% of the teachers. However, a higher percentage of 78.6% of teachers give a much or very much importance to the ability to solve a problem by several methods.

8. Logical-mathematical experience

80% of teachers are concerned about solving logical and mathematical problems. This is surprising given that the mathematics school curriculum does not explicitly address the issue of such issues.

Table 1. *Distribution and average in mathematical activities of components of mathematical aptitudes*

Components of mathematical aptitudes	**Subcomponents of mathematical aptitudes**	**Teachers %**					**Subcomponents average**	**Components average**
		Not at all (0 pt.)	**A little** (2.5 pt.)	**Average** (5 pt.)	**Much** (7.5 pt.)	**Very much** (10 pt.)		
Ability to memorize mathematical data, relationships, and mathematicalo perations	The ability to memorize mathematical formulas, methods and algorithms	1.4	24.3	44.3	21.4	8.6	**5.28**	**5.28**
Mathematical thinking	The ability to solve typical work tasks	0	10	32.9	42.9	14.3	**6.53**	**7.41**
	The ability to perform mathematical calculations	0	2.9	10	40	47.1	**8.28**	
Attention	The ability to	0	4.2	20	57.1	18.6	**7.25**	**7.25**

	solve typical mathematical tasks that require a small change in solving / approach							
Appropriate orientation in the given task	The ability to solve complex tasks that require proper guidance in the given task	1.4	1.4	22.9	50	24.3	**7.35**	**6.98**
	The ability to solve high level difficulty tasks requiring heuristic analysis	0	8.6	35.7	38.6	17.1	**6.60**	
Ability to generalize in the sphere of mathematical objects and mathematical relations	The ability to generalize certain results, methods, discovery of algorithms etc.	0	4.3	32.9	42.9	20	**6.95**	**6.95**
Ability to perceive, represent and operate with figures and spatial relationships	The ability to develop problem-solving models (schematic writing of data, drawings, etc.)	0	4.3	18.6	52.9	24.3	**7.43**	**7.43**
Flexibility of cognitive processes	The ability to solve a problem through several methods	0	2.8	18.6	50	28.6	**7.60**	**7.38**
	The ability to compose problems based on given requirements	0	4.3	21.4	51.4	22.9	**7.30**	
	The ability to make the transfer from a figurative representation to a concept and / or solve the problem	0	5.7	21.4	50	22.9	**7.25**	
Logical-mathematical experience	The ability to solve logical-mathematical problems	0	1.4	18.6	52.9	27.1	**7.65**	**7.65**
General average								**7.04**

3.5. Teacher's opinion on assessing pupils' math aptitudes

96% of teachers believe that math aptitudes is necessary to be evaluated at pupils, 1% think it is not necessary, and 3% "do not know" if the math aptitudes is necessary or not.

90% of teachers say they know methods / tools for assessing mathematical aptitudes, 4% think they do not know such methods, and 6% "do not know" if they know or not such methods.

Regarding the advantages of the tests for mathematical aptitudes evaluation, half of the teachers (50%) claim that through these evaluation tests the mathematical knowledge of the pupils is verified, the degree of acquiring them, the level of each student is known, the progress / regression recorded of it within a certain time frame, finding the shortcomings and difficulties. In our opinion these teachers confuse math aptitude tests with tests of knowledge that are give to students after a chapter / unit of learning taught.

31.42% of respondents believe that due to the mathematical aptitude test, talented students, those with special aptitudes or mathematical are found. Some teachers for primary education, 8.5%, consider to be an advantage that on the basis of the results of these evaluation tests they adapt in the future training strategies that will lead to the efficiency of the training process. There are also teachers, 5.7% of respondents, who assert that through these tests students develop their thinking. One person claims that the level of achievement of objectives is checked and another does not know what the benefits of these evaluation tests are.

Regarding the use of methods / tools to assess mathematical aptitudes in class, 57.1% of respondents said that at least every two weeks they use mathematical aptitudes assessment methods / tools. It is a good thing that evaluations of mathematical skills are achieved so often that teachers can achieve significant results. Unfortunately, 8.5% of teachers are not so concerned about assessing the mathematical aptitudes of students, making this assessment only once a semester, 2-3 times a year or not at all.

Three categories of evaluation tests were considered: initial, continuous and summative / final. In each of the three categories of evaluation tests, over 60% of teachers give much or very much importance to the evaluation of mathematical aptitudes. The average of the pupils' mathematical skills in each test category is shown in Fig. 3. The general average for assessing students' mathematical skills is 6.95.

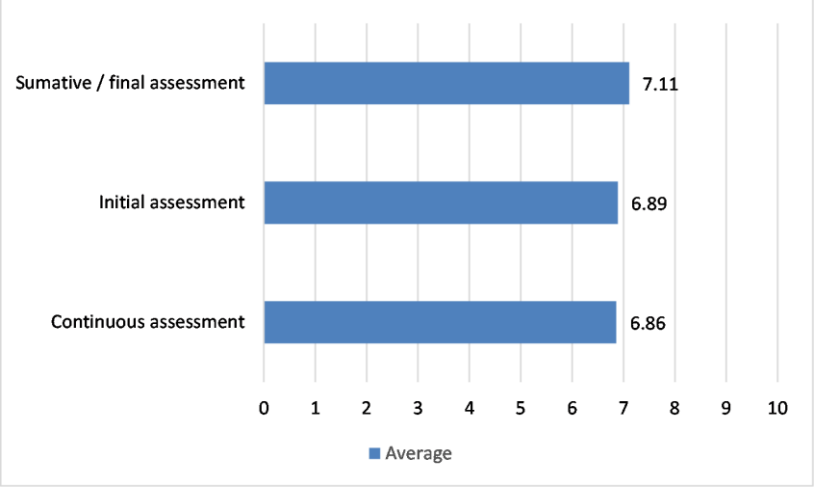

Figure 3. *The averages with which the aptitudes of students are assessed through each category of tests*

To find out how much training activities are focused on the development of students' mathematical aptitudes, a list was given to teachers (see Appendix), without specifying they are subcomponents of mathematical aptitudes. At each subcomponent respondents must give a value on a five values Likert scale. These subcomponents are part of the eight components of mathematical skills (Berar, 1991). In table 2 we made a centralization for these 8 components, which we will analize next.

1. Ability to memorize mathematical data, relationships, and operations

Table 2 shows that 28.5% of teachers assign little importance to the evaluation, while nearly 63% of them assign a medium importance of memorizing. The average of this component is the smallest of all components, however, surpassing the average of 5 pt. We note that 7.1% of teachers have a lot of emphasis on checking students' memory, which is not a good thing.

2. Mathematical thinking

While only 10% of teachers give a very much importance on assessing the ability to solve typical work tasks, there are 7.1% of teachers who give little importance to this component. The situation isn't the same on assessing the ability to perform mathematical calculations where 40% of teachers give it a very much importance. It is not surprising that 85% of teachers give a much or very much importance in assessment of mathematical calculations, since they are evaluated from the pre-school age. Teachers focus on mathematical thinking, the average of this component being the highest: 7.23, followed by a very small difference from the logic-mathematical experience with a score of 7.18.

3. Attention

Noteworthy is that 72.8% of teachers give much or very much importance to assess the ability to solve typical mathematical tasks that require a small change in solving / approach.

4. Adequate guidance in the given task

70% and 54.3% of teachers, respectively, give much or very much importance to assess the ability to solve complex work tasks, respectively with a high degree of difficulty. This trend is in line with the answers given by teachers to similar items for mathematical activities. However, there are teachers (1.4%) who do not give at all importance in assessment either for the task orientation or for solving the tasks with a high degree of difficulty, which is worrying.

5. Ability to generalize in the sphere of objects and mathematical relations

58.6% of respondents give much or very much importance to assess the ability to generalize certain results, methods, or to discover of some algorithms.

6. Ability to perceive, represent and operate with figures and spatial relationships

71.4% of respondents give much or very much importance to assess the ability to develop problem-solving models. This high percentage indicates that teachers regularly check students' ability to develop models.

7. Flexibility of cognitive processes

We also note the concern of teachers to assess the ability of children to solve problems by several methods, with 65.7% (much or very much) of this component. Even if fewer teachers check the ability to compose problems or to do the transfer, the percentages remain high above 60% (much or very much).

8. Logical-mathematical experience

68.5% of respondents assess much or very much the ability to solve logical-mathematical problems.

Table 2. *Distribution and average in mathematical tests of components of mathematical aptitudes*

Components of mathematical aptitudes	**Subcomponents of mathematical aptitudes**	**Teachers %**					**Subcomponents average**	**Components average**
		Not at all (0 pt.)	**A little** (2.5 pt.)	**Average** (5 pt.)	**Much** (7.5 pt.)	**Very much** (10 pt.)		
Ability to memorize mathematical data, relationships, and mathematical operations	The ability to memorize mathematical formulas, methods and algorithms	1.4	27.1	34.3	30	7.1	**5.35**	**5.35**
Mathematical	The ability to	0	7.1	41.4	41.4	10	**6.35**	**7.23**

thinking	solve typical work tasks							
	The ability to perform mathematical calculations	0	1.4	12.9	45.7	40	**8.1**	
Attention	The ability to solve typical mathematical tasks that require a small change in solving / approach	0	2.8	24.3	57.1	15.7	**7.15**	**7.15**
Appropriate orientation in the given task	The ability to solve complex tasks that require proper guidance in the given task	1.4	1.4	27.1	48.6	21.4	**7.18**	**6.83**
	The ability to solve high level difficulty tasks requiring heuristic analysis	1.4	8.6	35.7	38.6	15.7	**6.48**	
Ability to generalize in the sphere of mathematical objects and mathematical relations	The ability to generalize certain results, methods, discovery of algorithms etc.	0	8.6	32.9	35.7	22.9	**6.83**	**6.83**
Ability to perceive, represent and operate with figures and spatial relationships	The ability to develop problem-solving models (schematic writing of data, drawings, etc.)	0	7.1	21.4	51.4	20	**7.10**	**7.10**
Flexibility of cognitive processes	The ability to solve a problem through several methods	1.4	4.3	28.6	47.1	18.6	**6.93**	**6.89**
	The ability to compose problems based on given requirements	0	2.8	32.9	50	14.3	**6.9**	
	The ability to make the transfer from a figurative representation to a concept and / or solve the problem	0	4.3	34.3	45.7	15.7	**6.83**	
Logical-mathematical	The ability to solve logical-	0	2.9	28.6	47.1	21.4	**7.18**	**7.18**

experience	mathematical problems							
General average								**6.82**

3.6. Comparative analysis of the mathematical aptitudes' components between activities and tests

For a comparative analysis of the average of mathematical aptitudes' components between activities and tests we made Figure 4. It is observed a small difference below 0.5 pt. between averages of activities and test across all components. The biggest difference, of 0.49 pt. is on the flexibility of cognitive processes. This shows a good correlation between what is done in the classroom with what is being evaluated by the tests. We also find that only component has an average close to 5 namely memory capacity, all other components having averages between close to 7 pt. up to almost 8 pt. Teachers assign in activities the greatest importance to students' logic-mathematical experience, although at tests mathematical thinking seems to be the most targeted. It is surprising that logical-mathematical experience is placed on the first place in activities and on the second place at tests, since school curricula for primary classes contain only very few elements regarding logical-mathematical thinking.

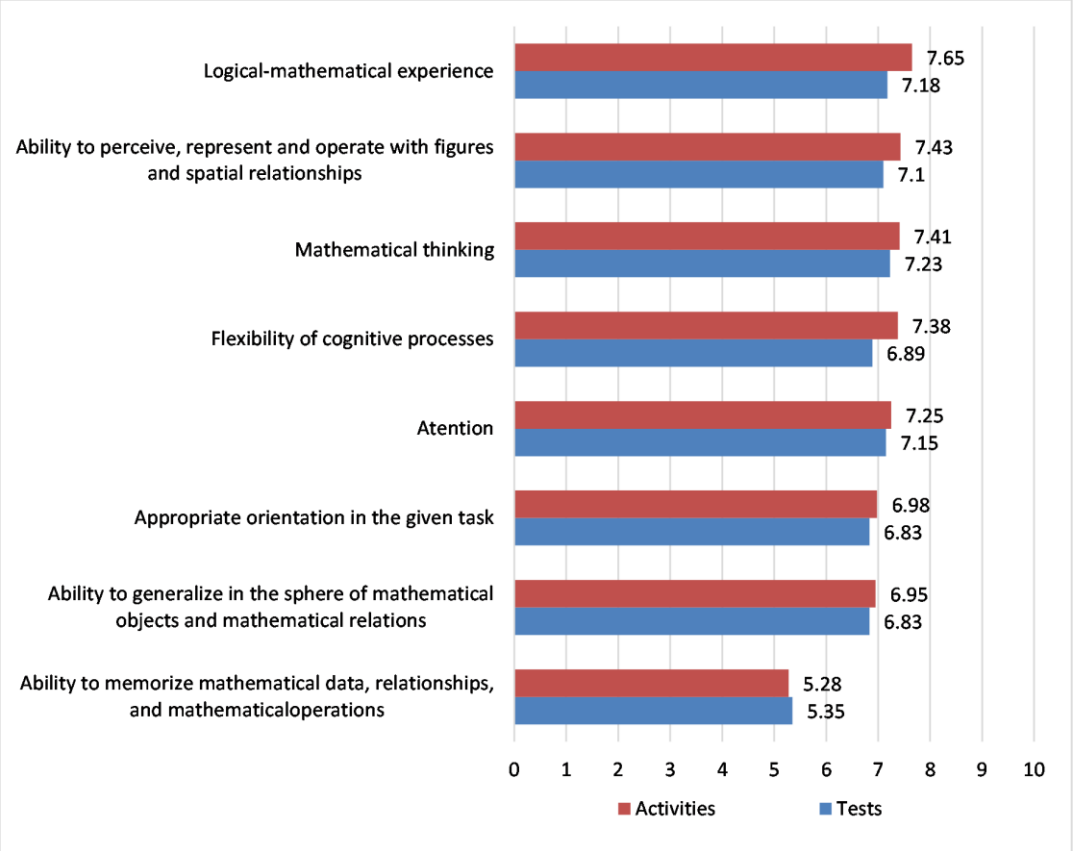

Figure 4. *Averages with which components of mathematical aptitudes are taken into account by teachers*

Another analysis can be made by comparing the general averages obtained in the last two items with the average of the teachers awarded at the previous items. Thus, comparing the general average of 6.82 on the mathematical aptitudes components in tests with the average of 6.95 that teachers have given to the extent to which they assess the mathematical aptitudes of students on different test categories, there is an insignificant difference. The general average of 7.04 of components of mathematical aptitudes from activities, although lower than the average of 7.325 that teachers have

provided on the extent to which their training activities contribute to the development of mathematical aptitudes, is also consistent with these. These results show that teachers are self-assessing correctly.

4. Conclusions and recommendations

We have found that the mathematics curriculum of the 4th grade does not refer to mathematical aptitudes. Also, the opinion of the teaching staff is that the tasks in the mathematics schoolbook contribute at most at an average level to the development of mathematical aptitudes. As a result, we can assume that the hypothesis H1. Mathematical curriculum documents aim at developing the mathematical aptitudes of pupils in primary education, is denied.

The results of the questionnaires applied to the teachers lead us to the conclusion that the hypothesis H2. Teachers systematically pursue the development of mathematical aptitudes of pupils in primary education, is confirmed. Teachers stated that through their training activities, they pursue much or very much the development of mathematics aptitudes. Teachers declare that use methods / tools to assess mathematical skills and give a much or very much importance to the evaluation of mathematical aptitudes in initial, continuous and summative / final evaluation.

At the theoretical level, the present study brings its contribution by realizing conceptual clarifications, supporting the necessity of cultivating and evaluating mathematical aptitudes. The development of mathematical aptitudes can start from the young school age because, since this age, forms of their manifestation appear.

Following the issues discussed above, as well as discussions with several primary school teachers, we propose a possible follow-up of the study. It would be interesting to investigate the relationship between mathematical aptitudes, rapidity in reactions, personal interests (motivation for mathematics) and factors that could influence the pupil's educational performance. The teacher can play an important role in the development of mathematical skills by changing the content of learning, focusing on competencies that predict the development of mathematical aptitudes, using methods that stimulate logical, mathematical thinking, and individualizing teaching-learning-evaluation activities. Improving the curriculum and introducing tests to assess mathematical skills in the 4th grade may be beneficial for the development of special secondary school classes for students with mathematical aptitudes. Also, a study might be made taking into account the age of students: 10-year-old, respectively 11-year-olds or the area where they are from (urban or rural). An eventual follow-up longer study could be a prediction of the performance until the students will finalize the secondary school.

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Authors

Magdaş Ioana, Babes-Bolyai University, Cluj-Napoca, Romania, e-mail: magdas_ioana@yahoo.com

Sale Claudia Alexandrina, pre-school teacher, Grădinița cu Program Prelungit nr.5, Zalău, Romania, e-mail: klapress@yahoo.com

Annex: Questionnaire for primary school teachers

1. Teaching experience: under 3 years / 3-5 years / 5-10 years/ 10-15 years/ 15-20 years/ 20-30 years/ 30-40 years/ over 40 years
2. Latest studies completed: Pedagogical high school/ Post-secondary school/ Bachelor's degree / Master's degree / Ph.D.
3. Didactical grade: debutant/ definitive teacher/ IInd grade/ Ist grade
4. How difficult is the fourth grade mathematics syllabus for middle level students?
    - Very easy
    - Easy
    - Average
    - Difficult
    - Very difficult
5. Give some characteristics of students with mathematical aptitudes: .....
6. Do you think mathematical aptitudes of students can be developed through appropriate training strategies?
    - Yes
    - No
    - I don't know
7. Do you think mathematical aptitudes of pupils need to be evaluated?
    - Yes
    - No
    - I don't know
8. Do you know methods / tools for evaluating the mathematical aptitudes of students?
    - Yes
    - No
9. To what extent the 4th grade mathematics schoolbook is adapted to:

	Not at all	A little	Average	Much	Very much	I don't know
The general development level of children aged 10-11 years						
Each pupil's category (weak, medium, good, very good)						
The needs of personal development of gifted pupils						

10. To what extent do the schoolbook's exercises contribute to the development of mathematical aptitudes of students?
    - Not at all
    - A little
    - Average
    - Much
    - Very much
    - I don't know
11. To what extent do the instruction activities you realize contribute to the development of mathematical aptitudes of students?
    - Not at all
    - A little

- Average
- Much
- Very much
- I don't know

12. How often do you use methods / tools to evaluate math aptitudes in class?
    - Once a week
    - Every 2 weeks
    - Every 3 weeks
    - Once a month
    - 2-3 times per semester
    - Once a semester
    - 2-3 times a year
    - Once a year
    - I don't use it
13. To what extent do each category of the assessment tests you give to the pupils contain items for mathematical aptitudes?

	Not at all	A little	Average	Much	Very much	I don't know
Initial assessment						
Continuous evaluation						
Sumative / final evaluation						

14. In your opinion, what are the advantages of tests for mathematical aptitudes?
15. Besides math classes where do students have the opportunity to demonstrate their math aptitudes? Give examples.
16. To what extent did your training activities focus on:

	Not at all	A little	Average	Much	Very much
The ability to memorize mathematical formulas, methods and algorithms					
The ability to solve typical work tasks					
The ability to perform mathematical calculations					
The ability to solve typical mathematical tasks that require a small change in solving / approach					
The ability to solve complex tasks that require proper guidance in the given task					
The ability to solve high level difficulty tasks requiring heuristic analysis					
The ability to generalize certain results, methods, discovery of algorithms etc.					
The ability to develop problem-solving models (schematic writing of data, drawings, etc.)					
The ability to solve a problem through several methods					
The ability to compose problems based on given requirements					
The ability to make the transfer from a figurative representation to a concept and / or solve the problem					

The ability to solve logical-mathematical problems					

17. To what extent do your assessment tests measure:

	Not at all	A little	Average	Much	Very much
The ability to memorize mathematical formulas, methods and algorithms					
The ability to solve typical work tasks					
The ability to perform mathematical calculations					
The ability to solve typical mathematical tasks that require a small change in solving / approach					
The ability to solve complex tasks that require proper guidance in the given task					
The ability to solve high level difficulty tasks requiring heuristic analysis					
The ability to generalize certain results, methods, discovery of algorithms etc.					
The ability to develop problem-solving models (schematic writing of data, drawings, etc.)					
The ability to solve a problem through several methods					
The ability to compose problems based on given requirements					
The ability to make the transfer from a figurative representation to a concept and / or solve the problem					
The ability to solve logical-mathematical problems					