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Effectiveness of RTI Model on Math Learning of 5th Grade Students with Special Educational Needs *

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Abstract

This study aims to reveal effectiveness of RTI (Responsive to Intervention) model on math learning of 5th grade students with special educational needs (SEN). The study also targets to reveal inabilities of students in learning math within the frame of general education through different approaches, test functionality of interventions for elimination of these inabilities, and determine whether students, who are thought to have SEN, are actually in need of special education. In the study, qualitative research method is adopted and holistic multiple case study design is used. Participants of the research consist of two students in the fifth grade in a state secondary school. Ten-week individual support educations, participant observation notes, video records, structured student interview forms, math achievement tests and daily math exercises are the data collection tools used in the research. Findings show that reasons arising out of teaching methods play a significant role in continuity of students' failures. Although participants, who were thought to have SEN at first, have poor mathematical skills, it is determined that observed behaviors of these participants are not directly related to general characteristics of learning disability.

Keywords

RTI
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Response to intervention
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Learning disability

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Introduction

Since each individual have different characteristics, learning environment are expected to be rich in learning methods. Additionally, some individuals cannot gain certain acquisitions they try to gain in the learning process at the same speed or they cannot find enough time to make them meaningful in their minds. While there are students using education opportunities provided to them in the best way, there also student who cannot keep up with normal education programs or encounter a number of preclusions from keeping up the same. Different programs, different methods and techniques or, in other words, special efforts, are needed for education of such individuals. In the math curriculum for secondary school, which was updated in 2013, it is stated that "For students with special educational needs, individualized education programs must be prepared and implemented in line with their attributes, education performances and needs on the basis of the education program for which they are

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responsible." (Ministry of National Education [MEB], 2013, pp. 16). However, National Council of Teachers of Mathematics (NCTM, 2000) emphasizes that all students should be provided with sufficient support and equal educational opportunities to teach them math, without regard to their personal characteristics, backgrounds and physical conditions.

A study on special educational needs and problems in America includes significant findings on common roles of special and general education in meeting educational needs of students. These findings have had a primary role in emergence of RTI (Response to Intervention). "The current system uses an antiquated model that waits for a child to fail, instead of a model based on prevention and intervention." (President's Commission on Excellence in Special Education [PCESE], 2002).

It is stated that the most distinct characteristic of students with SEN is their failure in school (Topbaş, 1998). Besides, there are also students who do not have learning disability yet fail in math lessons. Even though the difference between school failure and learning disability cannot be clearly established, such students without any learning disability may sometimes be identified as students "with learning disability" (Özyürek, 1981; Kavsaoğlu, 1993; Kırcaali İftar, 1998; Durmuş, 2007). Educators agree that it is important to use effective classroom management techniques and teaching strategies in the education of students with SEN as well as to provide educational services with special support besides the ordinary course of education. Khan (2013) suggests that, according to results of statistical researches in studies through individual supportive educations, there is a general improvement in math lesson. Altun (2006) emphasizes the importance of paying regard to individual differences of students and their related preliminary knowledge and skills, interests and needs in guiding the teaching process.

Learning principle, which is one of the six fundamental principles of "principles and standards" for school math, clearly express that students can learn math through understanding. Learning is improved in classrooms in a way to provide students with the change to evaluate their own ideas and ideas of others. Students are encouraged to make mathematical assumptions, test these assumptions and improve reasoning skills (Van De Walle, Karp, & Bay-Williams, 2013, pp. 24). Students are expected to develop different methods through their preliminary knowledge to establish a relation between mathematical concepts. "For meaningful learning, it is required to present relationships of mathematical concepts with their sub-concepts and super-concepts, and their connection with each other" (Dede & Argün, 2004).

It cannot be exactly identified whether the reason behind low academic success of students with SEN is caused by inadequacy of math education or by learning disability (Van De Walle, et al., 2013). These students, who try to study in normal educational institutions without being noticed, have difficulties through their entire educational lives and are forced into some kind of failure (Topbaş, 1998). On the other hand, RTI provides a model that requires early preventive measures, instead of waiting for the student to fail (IRIS, 2014; Van De Walle et al., 2013; Chidsey & Steege, 2010). RTI, which is the abbreviation of Response to Intervention, is described by National Center for Learning Disabilities (NCLD) as a multi-tier approach to the early identification and support of students with learning and behavior needs. In RTI, all students are observed in terms of outputs of special education, and targeted interventions are applied and monitored. Quality education and evaluation methods are systematically brought in. "It provides an opportunity for students to achieve." (Chidsey & Steege, 2010, pp. 5). Van De Walle et al. (2013, pp. 96) It is expressed that RTI is designed to distinguish underachievement caused due to inadequacy of math education and underachievement due to learning disability. Even if there is no single entirely researched and widely applied model of RTI, it is generally known as a three-stage school support model using research-based academic and behavioral interventions.

Application of RTI model starts with the tier of *qualified education and evaluation*. Students receive a qualified and science-based (manipulatives, conceptual emphasises, modelling etc.) to prevent any difficulty arising out of inadequate education (RTI Action Network, 2014). In order to establish an academic foundation and identify students in need of additional support, all students are periodically monitored and evaluated generally in eight-week periods (Fuchs & Fuchs, 2001). In the end of this period, students who step forward or make progress are parted from the tier 1, and students who do not make a sufficient progress in terms of expected knowledge and skills are transferred to the tier of *targeted interventions and evaluation*. Students who, according to results of evaluations, also fail to respond to interventions in this tier are transferred to the tier of *intense interventions and comprehensive evaluation*. Students who do not respond to these approaches despite a number of effective educational interventions are directed to receive services of special education (see IRIS and RTI Action Network for RTI and its tiers).

RTI Interventions for Math Education and Evaluation

In science-based education practices, education suiting to students' needs may be identified with interventions or exercises. The important thing is to see responses of students in these practices, regularly control and monitor their improvement and identify their needs with education (Chidsey & Steege, 2010). In this respect, RTI may be considered as a data-based decision-making system which provides the chance to make out a systematic plan for acceleration of learning in math. RTI may use various strategies in tier 2 such as individual diagnostic interviews, cooperation with special education teacher, modeling special behaviors and strategies. (For tier-2 RTI interventions in math education, see Van De Walle et al., 2013)

Johnson (2007) suggests that process monitoring in tier 2 must involve five fundamental components including skill tools, calculations, standard four-operation problems, general problem-solving skills and mathematical verbal repertoire (concepts, relations and communication). In the end of the evaluation, it is expected to receive answers to questions which students need math interventions, what kind of interventions do these students need and how effective these interventions are. Evaluation must be compatible with targeted acquisitions as specified in the math curriculum and may be made either through a comparison of performance of a student to performance of another student at the same grade or through a comparison of performance of one student or all students to performance expectations at that time of the year. Results of this comparison may be used in determining students in need of intervention.

Students at risk have difficulties of attention, motivation and self-control which may adversely influence their behaviors and learning processes mostly because of poor academic outputs (Fuchs et al., 2006; Ünay, 2012). These students benefit more from comprehensible education rather than discovery-based methods (Kroesbergen & Van Luit, 2003). Interventions in the area of basic skills for four operations, concepts, fluency and understanding improve achievement of these students in terms of operation solving, fluency and understanding (Kroesbergen & Van Luit, 2003; Vaughn, 2010). Education design for RTI practices starts with teaching a range of basic skills like counting by use of number combinations, making calculations, solving problems and cross-checking that students can apply to the entire curriculum (National Center for Learning Disabilities [NCLD], 2013).

In the literature, there are studies, which analyze students with SEN generally in the area of special education, involve researches limited to the field of psychology and mainly review opinions on determination of educational and social needs of inclusive and gifted students. It is also understood that studies using RTI model generally analyze effects of RTI on reading and, at the least, its effects on academic achievement in math (Fush et al., 2006; Vaughn, 2010; Ritchey, Silverman, Montanaro, Speece, & Schatschneider, 2012; IRIS, 2014). However, researches on determining effects on math achievement include comparisons of students' scores in exams. Accordingly, it is seen that, in the studies, quantitative methods are used and qualitative methods are ignored. One of the points distinguishing this study from

the literature is the use of qualitative research methods. It is thought that is is important to implement, and share the results of, this model, which constitutes the ground of this study and accepted as a useful model for revealing and identifying structure of learning by students in some countries, but the level of effectiveness of which is not exactly proved.

Due to the inadequacy of researches on the extent of students' learning primary school subjects, which constitute the foundation of math program in secondary school, this research focuses on the level of 5th grade. On the other hand, early math interventions may eliminate inadequacies (without being piled up) and prevent any potential inadequacies (Fuchs, Fuchs, & Karns, 2001; Griffin & Case, 1997; National Center for Education Statistics [NCES], 2003; Sophian, 2004; Clements & Sarama, 2007; U.S. Department of Education, 2008; IRIS, 2014). Therefore, improvement of math learning by students with SEN will be analyzed in scope of RTI model.

Method

This study aims to reveal effectiveness of RTI model on math learning of 5th grade students with SEN. In this respect, the research is designed on the basis of case study, which is a qualitative research method.

Participants and Research Environment

Participants of this research are 5th grade students studying in a state secondary school (socio-economically at a medium level) in one of the central districts of Ankara in the first semester of the academic year 2014-2015. In order to determine participants, math achievement tests (MAT) was firstly applied on all 4th grade and 5th grade students in the whole school and, accordingly, MAT-A was applied on the same grades and, one day later, MAT-B was applied only on 5th grade students (MAT-A covers acquisitions of the first 3 years of math curriculum of primary school and MAT-B covers all acquisitions of 4 years). An observer is appointed by the school management for these exams, and all students are put through the exams concurrently. These exams are read by the researcher within two weeks and results are shared and evaluated with the academician, who have brought MATs into the literature,

Since the data obtained from MATs do not constitute a reference value for achievement or failure, participants of the research are determined as follows: First of all, students within the intersection set of 5th grade students with a grade below the average of 4th grade students in MAT-A test and 5th grade students with a grade below the average in MAT-B test are determined. Then, academic results of tests taken by these students are evaluated in a meeting held by math teachers, primary school teachers of students in previous year(s) and school counselors. In consequence of these evaluations, 18 students are determined. These students are considered as students at the level of tier 2 according to RTI model (Due to the high number of branches and students and constraints of school management, teacher and teachers, students at the level of tier 2 are determined by means of MAT in this study). 6 students selected from the tier-2 level through simple random sampling are put through 12-week support educations and, as education in small groups is required at the tier-2 level, two of these students (coded as Yeşim and Sultan) constitute the population of the study (Bryant, Bryant, Gestern, Scammacca, & Chavez, 2008).

Both students gave correct answers to 12 questions in MAT-A, and Yeşim gave 12 and Sultan gave 13 correct answers. School-wide MAT averages are given in the following table.

Table 1. School-wide MAT Average

Grade	Exam Name	Number of Students Having Taken the Exam	Average	Maximum Achievable Score
4th Grade	MAT A	140	18.60	50
5th Grade	MAT A	117	23.15	50
5th Grade	MAT B	118	26.44	62

Yeşim and Sultan are students at the tier-2 level, which is also expressed as pre-orientation. These students could not reach to the expected achievement level; however, it is not certain yet whether they need special educational services. These students must receive additional target-oriented education (Van De Walle et al., 2013, pp. 96). Participants of the research are not gifted or inclusive students; they are students who have serious problems in learning at school, have considerable difficulties in gaining acquisitions and developing skills in the math curriculum, but do not have any other particular handicap (sensory disability, mental disability, social and emotional disability). Both students, who studies in the same primary school, have the general skills expected at their age and have no physical disability).

MATs, which are applied to determine participants, are also considered and evaluated as an indication of readiness levels of students. Even though they are called as tests, MATs are not multi-choice exams. Both tests are classical tests without partial scoring (Fidan, 2013; Olkun, Akkurt Denizli, Kozan, & Ayyıldız, 2013). Fidan (2013, pp. 93) suggests that these achievement tests can be used to determine individuals who have difficulties in learning in the area of math education and need special education. Finally, since double-shift schooling is applied in the concerned school and therefore there are lessons all day long in all classrooms, RTI support educations are given in the school library.

Data Collection

Researcher adapted acquisitions of the math curriculum of the 4th grade in primary school, and applied this curriculum for 12 weeks, being 2 hours a week. He took place in these support educations both as a practitioner and a participant. In this extent, qualitative data of the research consists of observation notes, video records, structured interview forms and subjects and homework of the lesson.

In this research, "Daily Practice Problems" designed for Delaware RTI program was adapted and prepared as formative assessment materials with the name of daily math exercises (DME) and used in support educations. Also covering homework given to students, GME contains targeted acquisitions specific for each week for a period of 12 weeks in total. In accordance with the MINISTRY of EDUCATION'S mathematics curriculum students follow their DME prepared as a tool for development. Delaware RTI program suggests that formative assessment must be used to monitor students' achievement and the best way to do is to apply daily math exercises (Delaware, 2010). DMEs, which are also used as diagnostic interviews, are significant documents including participants' answers, solution strategies, estimations, suggestions and post-intervention solutions. Diagnostic interview is a tool utilized for obtaining in-depth information about students' knowledge of a certain concept and their mental strategies (Van De Walle et al., 2013, pp. 87). In this extent, students were given an exercise or problem in every lesson and they were expected to express their opinions in the solving process. Two examples of questions in DME are given below.

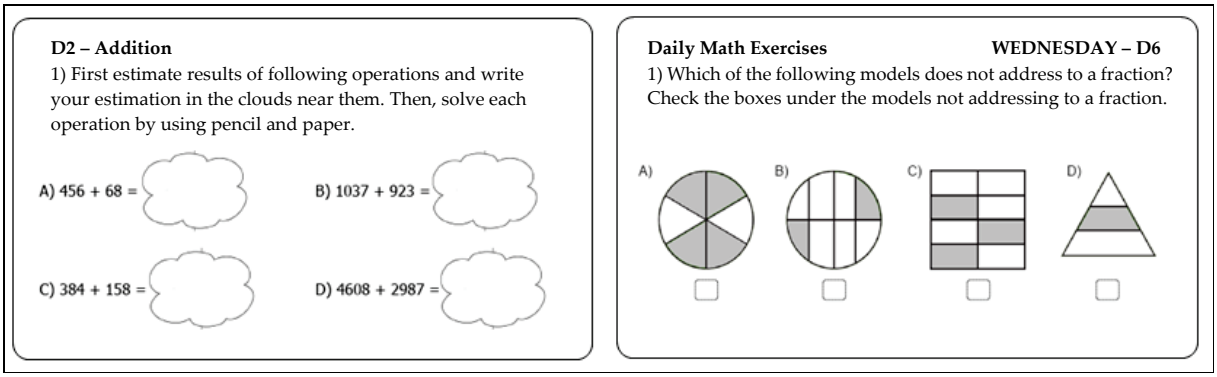


Figure 1. Daily Math Exercises

In support educations, answers of students were intervened and it was attempted to direct students to correct answers and they were expected to find solutions and different solution strategies. During educations, learning sub-domains of natural numbers and addition, subtraction, multiplication and division are addressed.

The school counselor provided collaboration within the process from determination of participants to the end of support educations, and improvements in participants were evaluated together every week. Besides the school counselor, math teachers of students also contributed to these evaluations. No exam was held, no score was given to students and no comparison was made between students in any stage of the evaluation. Two examples of interventions in support trainings are given below.

Probe	Probe
2) Write the numbers specified below. A) 7 tens and 4 units: … C) 50 tens and 2 units: … B) 7 hundreds and 13 units: … D) 81 hundreds and 5 units:…. E) 8 tens of thousands + 6 hundreds of thousands + 2 units + 1 thousands + 5 tens: …	**1)** Do the following operations. First estimate results of following operations and write your estimation in the clouds near them. Then, solve each operation by using pencil and paper. A) 46 x 7 B) 54 x 35
Intervention	Intervention
Base ten blocks were used. Since students had not seen them before, each part was introduced to them. After that, firstly 5 units (one's place), 4 longs (ten's place) and 3 flats (hundred's place) were modeled. Each student was made to make similar models and asked to write on the board the numbers he/she modeled. Each student was able to write on the board the number he/she modeled.	Students were expected to make good choices for estimations. Increasing one multiplier and decreasing the other for the number to be closer to the real answer was emphasized. Students were warned not to use pencils and papers. First of all, they were asked to increase 46 to 50 and 7 to 10 (option A) and estimate. Students gave the answer 500 as estimation. Then, they were asked to increase 46 to 50 and estimate again. They were asked to make estimations also for the option B and write result of each estimation on the board.

Data Analysis

Descriptive and content analysis methods may be used for analysis of data in qualitative researches (Glesne, 2012; Yıldırım & Şimşek, 2006). Both methods were used in this research. Different themes were created by means of content analysis for components of the intervention category, and an analysis was made according to components of math learning and learning disability categories, which were determined before through descriptive analysis.

Data analysis techniques of the grounded theory were used in the content analysis. Accordingly, the analysis aims to develop an abstract theory directly explaining what matters in data (Strauss & Corbin, 1998) This aim is achieved through codes and themes formed with these codes. In this context, comparative analysis method was used in the analysis of data. In this regard, video records and transcripts of interviews were taken as basis and the data were reviewed through open coding, and divided and coded. Then, codes were evaluated through axial coding and associated with each other. The intervention category was formed by means of these codes. Problem solving by participants, strategies used for solution, papers on which answers given after interventions are written, daily math exercises given as homework and collected one week later were analyzed through document review in the evaluation of data collected. Expressions and explanations of participants in problem solving processes were utilized for evaluation of the collected data. The collected data was organized and

interpreted on the basis of the problem of the research. Observation notes taken by the researcher during support educations were also used to control and support the mentioned data.

The researcher interacted with students as a participant observer for 12 weeks. Using the observation notes taken within this period, interview transcripts and video records, it was aimed to achieve reliability of the research. For consistency of the research, the formula "Reliability = Number of Agreements / Number of Agreements + Number of Disagreements) (Miles & Huberman, 1994). Accordingly, agreed and disagreed points on transcripts were discussed with an academician with a knowledge of the research subject and specialized in the field of math education, and necessary adjustments are made. Since the coding reliability was calculated to be over 70%, this result was considered reliable. Research design, participants, data collection tools, data collection process and data analysis were described in detail and thus it was attempted to ensure transferability of the research.

Findings

Lessons taught during the research process were prepared on the basis of acquisitions in the math curriculum of secondary education. Accordingly, students are expected to have gained acquisitions in learning sub-domains of natural numbers, addition with natural numbers, subtraction with natural numbers, multiplication with natural numbers and division with natural numbers. However, findings show that student did (could) not gain these acquisitions, which the students are assumed to have gained, as conceptual knowledge. Students associate rules they are skilled in basic operations to the meanings they bear. It was observed that interventions make an impact for students to notice these associations. Findings obtained in data analysis reveal that the reason behind academic failures of students arises from factors caused by teachers, rather than learning disability.

Current Status before RTI

To determine participants, MAT was made in the beginning of the academic year. In these achievement tests involving learning domains of numbers, geometry and measurement, answers of Yeşim and Sultan are significant indicators for revealing their academic standing. Accordingly, it was found out that Yeşim and Sultan did not have the acquisitions in the learning domains of math curriculum (1-4).

It was seen that both students could not give correct answers in multiplication and division operations. To the question asking to divide 52 into 4, Yeşim gave the answer "124" and Sultan gave the answer "14". Considering the operations they used, it was obvious that both students did not make the operation in accordance with basic rules of division. Students were asked to write the decimal notation "24/100" by using a comma, and both of them gave the answer "24,100", which was wrong. Again, the question "what is the digit value of 3 in the number 3725" was asked and Yeşim gave the answer "hundred thousand". Sultan named the digits as "units digit for 5, tens digit for 2 and hundreds digit for 7", but left the number 3 empty. Both students made similar mistakes in multiplication and division operations.

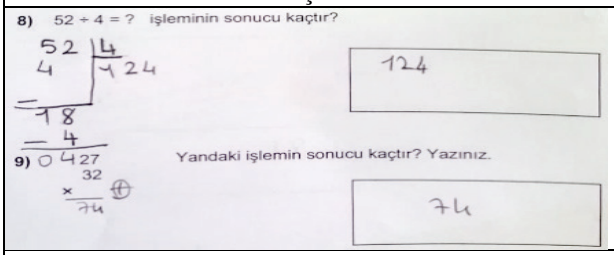
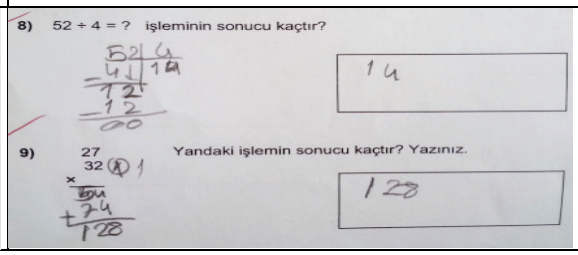
Yeşim	Sultan
	
8) What is the result of 52 ÷ 4 = 2? *9) What is the result of the operation on the left? Please write.*	

Figure 2. Answers for Division and Multiplication Operations (MAT-A)

It was observed that both Yeşim and Sultan did not have the necessary knowledge of concepts, they were unable to make operations with basic rules or in compliance with operational rules, they were unable to solve problems with two-step operations, they had an incomplete or incorrect comprehension and could not find the right answers for many questions. Mistakes of Yeşim are generally similar to basic mistakes of Sultan.

RTI Process

In the 12-week process of RTI support educations, considerable developments were observed in academic standing of both students starting from the sixth week. Observation of this process has made it possible to identify students on the basis of formative evaluation data and reveal positive impacts on their academic standing. Themes involved in mathematical competence observed in participants during the process are gathered under the title of mathematical learning; and behaviors during the same process are gathered under the title of relations with general characteristics of learning disability.

Math Learning

In answering the question for revealing comprehension of concepts of natural numbers and digits, Yeşim expressed that natural numbers are "*1, 2, 3, 4, 5, ...*" and digits are "*units, tens, hundreds*". In return, the researcher asked "what about 0 and 100" and she answered "they are natural numbers, too". For the same question, Sultan stated that natural numbers are "numbers like 0, 1, 2, 3" and digits are "units, tens, hundreds", similar to the answer of Yeşim. When the researcher showed "2/1" and asked "Is this a natural number", they both said that it was not a number, but a fraction. When they were asked to explain why it was not a number but a fraction, Yeşim said "*Because it has a denominator*" and Sultan said "*Numbers are not shown like that*". It was understood that students named every natural number as a number; however, when different representations of natural numbers were given, they did not consider it as a number.

It was observed that Yeşim acted quickly with the intent of solving before her friends. It was seen that this behavior, which was repeated in the subsequent lessons, caused Yeşim to make mistakes more frequently. Yeşim could not write four- or five-digit natural numbers and Sultan could not write six-digit numbers, readings of which were given. It was determined that students had incomplete knowledge of the concept of digit. Before the lesson started, the researcher showed base ten blocks on the table and asked students whether they had seen them before. It was understood that Yeşim and Sultan had not seen base blocks before. After that, the researcher introduced base ten blocks to students and showed them example models. He explained that thousands consisted of 10 hundreds or 100 tens or 1000 units. Then, he modeled the numbers, pronunciations of which were written on the board, by using the base blocks. Yeşim and Sultan were asked to make a model similar to the one made by the researcher, and they could model a four-digit number. They could also read a number modeled with base blocks. Base blocks highly attracted attentions of both students. It was seen that they constantly took some parts in their hands and made models in their own way. In consequence of this demonstration and explanation in front of the board, it was observed that both students changed their answers and corrected their mistakes.

Yeşim and Sultan can round a three-digit natural number to the closest ten and to the closest hundreds. It was determined that, when four- and five-digit numbers were given, Yeşim could round by looking at the last two digits of the number, but she also rounded the first two numbers. For the number 156, Yeşim found the number 160 when she rounded it to the closest tens, and found the number 200 when she rounded it to the closest hundreds. However, for the number 2463, she found 2060 when she rounded it to the closest tens, and found 20500 when she rounded it to the closest hundreds, which were both wrong. Here, Yeşim rounded the number 63 correctly to 60, and rounded the number 24 incorrectly to 20. When she was asked how she rounded 2463, she said 24 should also be rounded to the closest tens, namely 20. She also made a similar rounding for the number 49.248. It was seen that she rounded it to 50 250 as the closest tens. It was observed that Sultan also made similar mistakes in rounding. It was seen that Sultan rounded four-digit numbers to the closest hundreds and repeated the

same mistake for several examples. For example, for the number 156, she found the number 160 when she rounded it to the closest tens, and found the number 200 when she rounded it to the closest hundreds. However, for the number 2463, she found 2460 when she rounded it to the closest tens, and found 2460 when she rounded it to the closest hundreds, which were both wrong. At this point, it was understood that, when Sultan rounded numbers with more than three digits, she thought that only the units digit should be turned to zero. She rounded the number 49.248 to 50 000 as the closest tens. When she was asked how she rounded the number, she said that numbers other than the first one should be turned to zero. It may be suggested that both Yeşim and Sultan made overspecialization. Limited conceptualization of rules of rounding by both students leads to overspecialization (Bingölbali & Özmantar, 2012, pp. 9).

It is understood that frequent mistakes in Yeşim's homeworks are generally caused by her rush in solving. In Tuesday's homework, she gave the answer 0568 to the question asking to find the smallest four-digit number by using each of the numbers 0, 6, 5 and 8 once. The researcher noticed that, generally for numbers she wrote, she kept writing 0 to the leftmost of the number. When she was asked why she did this, she answered "*My teacher told us to always write to the beginning when asked for the smallest number*".

It is understood that Yeşim did not pay attention to the rule of four digits while writing the asked number. It is understood that, in her past experiences, her teacher taught them to write zeros to be beginning without any limitation to the number of digits. Yeşim's attempt to write the smallest natural numbers one can write with four numbers when there is a limitation of digits is considered as overgeneralization, which is a kind of misconception. It is also seen that Yeşim made a habit of writing zero to the left of the number in a way to form three-digit numbers while writing numbers in orders. For example, when the number read as "eighty six thousand three hundred and seven" is given, she writes it as "086 307".

It was observed that Sultan did not make close estimations in addition operations with natural numbers. However, she can find the correct result of addition of two natural numbers by using pen and paper. It was observed that she could correctly apply the basic rules of addition. Sultan estimated the sum of 54 and 8 as 500. She could not answer the question how she found this estimation, which had nothing to do with the correct answer. After that, the researcher made an intervention for teaching the estimation strategy. It was explained that results of such operations could be determined by rounding without calculation. Accordingly, it was stated that, while estimating the result of 54+8, 54 could be rounded down to 50 and 8 could be rounded up to 10, and the result could be found as 50+10=60. It was also suggested that a similar strategy could be used for 963+534, and Sultan was asked to make the rounding. Sultan said that 963 could be rounded to 900 and 534 could be rounded to 600, but she was unable to add these rounded numbers in her mind. It was stated that it would be easier to round 963 to 1000 and round 534 to 500. A few more examples were given and direct estimation strategy was taught to Sultan.

It was observed that Yeşim made close estimations in addition operations with natural numbers. Although she could make close estimations for addition of two natural numbers, she could not find the correct answers by using pen and paper most of the time. For addition of natural numbers written side by side, she preferred adding the numbers by writing them one under another. Yeşim made many mistakes in the concept of carry in addition, even though she knew about the concept. When looked into the operations she made, it is understood that she can see her mistakes and these mistakes are mostly caused by the desire to find the answer fast, namely before her friends. She could not make the additions correctly due to her concern for finding the solution faster than her friends. The researcher noticed that and called her to the board. Upon this intervention aiming for her to find her mistakes herself, she was able to do the same additions without any outside guidance.

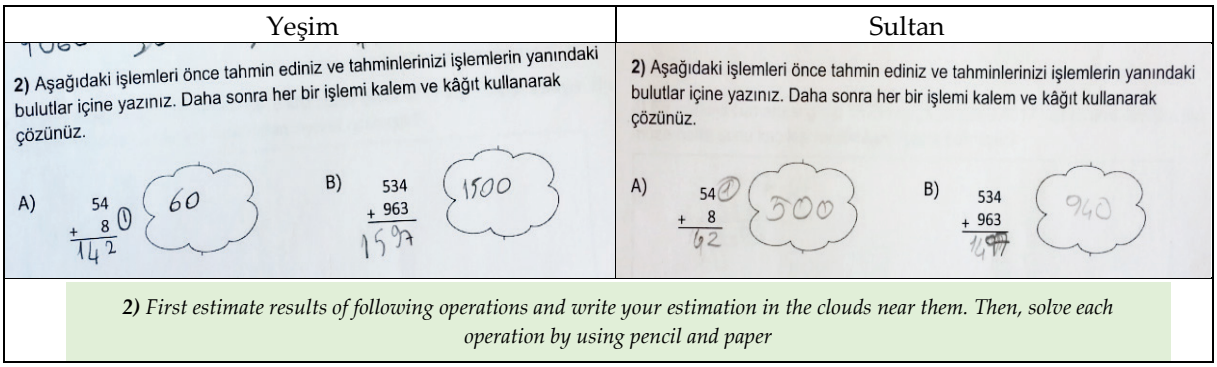


Figure 3. Answers for Addition

It was observed that Yeşim's estimations in subtraction with natural numbers were not close the correct result. When she was asked to explain the strategy she used, she answered "*I round the numbers*". Although rounding operations were taught in the lesson in the previous week, she could not round to the closest tens, hundreds and thousands. For example, to the question asking to calculate the result of "38 - 5", she rolled 38 to 30 and 5 to 0 and gave the answer 30. However, it was seen that, in this question, Sultan rounded 38 to 40 and 5 to 10 and found the difference as 30.

One addition and one subtraction questions with carry "1" were asked to understand whether both students know addition and subtraction either operationally or conceptually. In these operations, to the question whether the carries given as "1" represent the same amount, both students have the answer "*They are the same*". After that, the researcher (Rs.) had a brief conversation with Yeşim about the question and Sultan also took part in the conversation. A part of the conversation is given below.

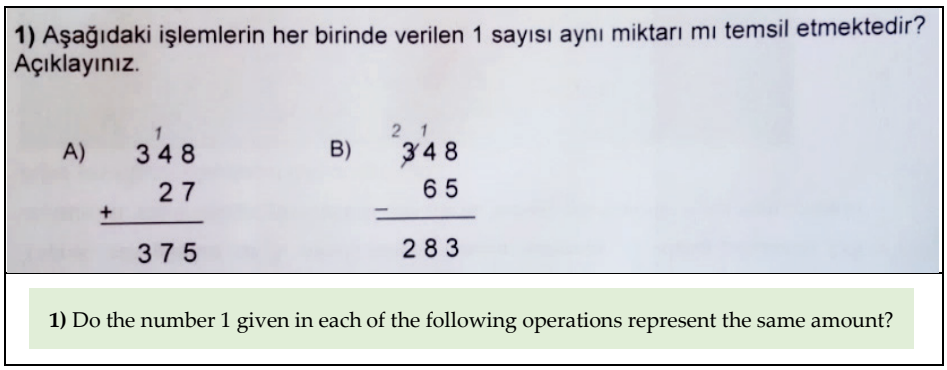


Figure 4. Addition and Subtraction with Carry

Rs. : In the addition (in option A), to which number did you add 1?
Yeşim : 4.
Rs. : So, what did you find when you add?
Yeşim : 5.
Rs. : In the subtraction (option B), to which number did you add 1?
Yeşim : I added it to 4, too.
Rs. : So, what happened when you added?
Yeşim : (*thinking*) 14.
Rs. : Then, are amounts represented by these two 1s the same?
Yeşim : (*thinking*)
Rs. : While 1 is added to 4 in option A, 10 is added to 4 in option B. Why?
Yeşim : (*does not (cannot) answer*)
Sultan : Because, if we add 1, 6 is not subtracted from 5.

It is understood that Yeşim and Sultan paid attention to the place value operationally, but could not structure it conceptually. It may be suggested that both students poorly associate the rules, about which they become skilled in addition and subtraction operations, to meanings they have. It is seen that both students have poor conceptual skills of place value.

It is observed that Yeşim and Sultan are unable to make close estimations for multiplication of two natural numbers. For example, for the result of 18 x 75, Yeşim estimated it as "2000" and Sultan estimated it as "1000". To the question of which strategy they used in estimating, Yeşim could not give an answer and Sultan gave the answer "*I turned 18 into 10 and 75 into 100*". Not seeming sure about her answer, Yeşim waited for a while silently and just said "Well...". At this point, it was understood that Yeşim and Sultan needed an intervention to learn the estimation strategy for a multiplication. Increasing one multiplier and decreasing the other for the number to be closer to the real answer was exercised for a few minutes with both Yeşim and Sultan. In the example multiplication, it was asked to increase 18 to 20 and decrease 75 to 70 and it was seen that both students gave the answer 1400 in a short time. It was repeated that, in order to estimate the result of 18·75, numbers were rounded and the result was found as 20·70 = 1400. They were asked to notice that one of these numbers was rounded to the upper tens and the other was rounded to the lower tens, and thus a better estimation was made. It was emphasized that, if both numbers were rounded up, an overestimation would be made.

It was observed that Yeşim was able to multiply a two-digit natural number by a one-digit natural number; however she was unable to multiply two two-digit numbers. When she was asked questions according to her answers, it was understood that she did not know rules of multiplication. After that, Yeşim (and also Sultan) was given a previously prepared 10·10 multiplication table and she was asked to blacken the frames for each multiplication she knew. Yeşim blackened most of the frames in the table, but she did (could) not blacken certain frames like 54, 56, 63, 72 (It was observed that Yeşim was happy to blacken a high number of frames). Sultan blackened all frames.

It was understood that Yeşim was unable to multiply 9 by numbers higher than 5. For this reason, the researcher showed her as a strategy that she could use her fingers for multiplication by 9. It was also explained for both Yeşim and Sultan that 7·9 was 7 less than 7·10 and 8·9 was 8 less than 80 and 9·9 was 9 less than 90. It was expressed that there was enough exercise on these subjects in homeworks and they needed to solve these exercises. It was noticed that Sultan frequently interrupted during explanations of the researcher. From her behaviors like pointing out the ringing school bell sometimes, standing up and looking at students in the schoolyard, attempting to show every question she answered to the researcher, asking permission for drinking water or going to bathroom, it was understood that Sultan easily become distracted during lessons and lost her interest. It is understood from these behaviors, which were observed in almost every lesson except for the first one, continued in spite of the researcher's warnings and they were involuntary behaviors.

When they were asked to multiply two-digit natural numbers with their units zero, it was seen that Yeşim always forgot one zero in multiplication. For example, for 80x30, she gave the answer 240. After repeating the same mistake in four similar multiplications, Yeşim was asked to write a rule for multiplications with zero (where the units digit is zero). Yeşim gave the answer "*Firstly we multiply the number and put a zero in the end*". She was asked why she did so and she showed the first multiplier with her pencil and said "*My teacher told. He had told us to multiply the numbers first and then put zero".* After that, she was reminded that she should not forget the zero in the second multiplier, and two examples were solved at the blackboard. It was understood that Yeşim used as the second multiplier the numbers from 1 to 9 in similar multiplications in the past, and she became operationally skilled in such use. However, it was seen that she did the same thing in all similar operations. This was considered as overspecialization, which is a kind of misconception. However, it was observed that Sultan could multiply two-digit numbers units digit of which is zero without using pencil and paper.

When answers to questions for determination of whether three-digit natural numbers could be divided by natural numbers with maximum two digits were analyzed, it was seen that Yeşim could do the division when both dividend and divisor were multiples of 10. However, it was seen that, when at least one of dividend or divisor was not a multiple of 10 or when the quotient was two-digit, she was unable to use rules of division. As seen in Figure 6, when she was asked to divide 366 by 24, she multiplied 5 in the units digit of the quotient by 4 in the units digit of the divisor and wrote in the respective area. However, she could not multiply 5 by 2 in the tens digit of the divisor. Yeşim focused only on units digit of the divisor. She made the division in the option C wrong and therefore she found the wrong remainder. She could not understand that she needed to multiply 2 in the units digit of the quotient by 23. However, it was seen that Sultan found correct answers of divisions in the options A and B, but failed to correctly do the division in the option C. In that option, she tried to multiply the dividend number by the quotient number. It was observed that, even though Sultan did the division correctly, she could not associate division to multiplication. At this point, an intervention was made directly by method of teaching.

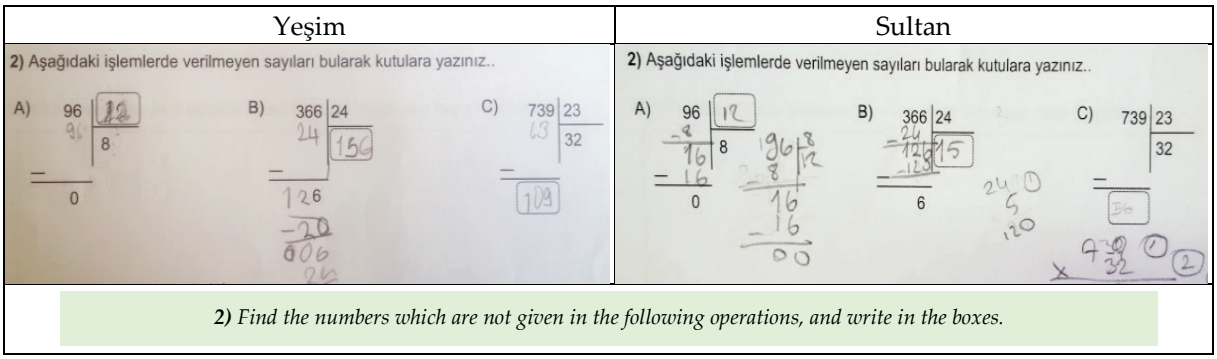


Figure 5. Answers for Division

Examples were given for teaching rules of division; students were called to the blackboard and asked to do similar divisions. It was ensured that they checked whether the division was correctly solved by associating it to multiplication. It was observed that both students had vulnerabilities in learning rules of division. It was determined that these vulnerabilities made a negative impact on learning rules of divisions; students could not associate multiplication and division to each other or become skilled in these rules. For example, they could not mentally calculate the answer of the question "what is the result of 72÷8"; to the question "what is 8 times 72?", Sultan gave the answer "9" and Yeşim started to count rhythmically and could answer after a long while. It was noticed that Yeşim could not associate 72÷8 to 8·9.

Relationship with General Characteristics of Learning Disability

It is aimed to associate mathematical competence and behaviors of Yeşim and Sultan observed within the process to characteristics (Ünay, 2012) of learning disability. Findings from RTI process Yeşim and Sultan frequently experience only the attention deficit, which is a characteristic of learning deficit. It is understood that they have difficulty in using previously acquired information, even if rarely. Besides, it is observed that neither Yeşim nor Sultan have behaviors which are generally and directly linked to characteristics of learning disability.

It is clear that they do not act carefully in the problem-solving process. Their inability to read the problem or have a fluent reading and tendency to swallow words or syllables causes them not understand the problem. Yeşim makes mistakes frequently or acts inattentively, because she rushes to answer. She tries to read questions fast and find the answer before her friends and therefore she experiences attention deficit. It is seen that both students can write mathematical expressions and numbers fast and legibly as their peers. It is observed that they can understand verbal instructions of the researcher and do exercises. They can make solution-oriented explanations when they read problems slowly and repeatedly through rhythmic counting and mental simple calculations. They can see relationships between figures or number patterns and they do not have problem in hearing or expressing.

They can keep the given information in their minds. They can correctly write on their notebooks or work sheets any question or example written on the blackboard. They can solve problems with one-step operations, but they have difficulty in solving multi-step problems. It is understood that Yeşim and Sultan can correctly perceive numbers and other mathematical expressions and it cannot be suggested that they have memory problems.

It is observed that they try to solve the whole problem, even if the result is not correct. It is determined that, if they fail to solve, Sultan asks for help from the researcher and Yeşim does not ask for any help, but often look out of the corner of her eyes what her friends do. They can easily read four-digit natural numbers and have problems in reading numbers with more than four digits. It is observed that they can generally continue a given figure or number pattern, but they have difficulty in generalizing. Even though they have certain background information about concepts, they cannot express this information with math language and do not make explanations most of the time. It is observed that they are not much successful in using in their explanations the information they have learned or acquired before. For example, both students used the expressions "1, 2, 3, ..." for the concept of natural numbers and "units, tens, hundreds" for the concept of units. They stated that the expression "2/1" was not a number, but a fraction. When they were asked about the reason, Yeşim said "*Because it has a denominator*" and Sultan said "*Numbers are not shown like that*". Argün, Arıkan, Bulut, and Halıcıoğlu (2014, pp. 2) suggest that, in explaining concepts, student explain meaning of the concept within the context and therefore their comprehension of that concept is generally superficial. Although it is observed that both students sometimes have difficulties in using information, it is estimated that these difficulties depend on poor learning or non-reinforcement of past information.

To sum up, according to the findings, it is determined that these two students do not have full knowledge of mathematical concepts in scope of acquisitions, but they do not have much difficulty in doing the relevant operations and can find the correct answers through interventions. Even though Yeşim and Sultan do not have a sufficient level of conceptual knowledge, it may be suggested that they have sufficient operational skills at the basic level. It is possible to make the comment that they have not fully comprehend the subject, but they have made a great number of exercises on the subject in the past. It is seen that they are able to apply rules of operation and do addition, subtraction, multiplication and division with natural numbers. It is understood that students' attention deficit prevents conceptual learning or perception of mathematical relations. It is seen that mistakes in operations are caused by incorrect or incomplete knowledge and, when the necessary intervention is made, students can correct their mistakes. It is observed that they generally do not have problems with using math language, but they do not have self-confidence in such cases. Data obtained from parent interviews also support the researcher's observations. Parents state that they cannot show enough interest in their children, and previous teachers have also used similar expressions in relation to attention deficit. They express that, besides math, similar problems are also experienced in other lessons. In short, findings obtained from the research show that, although Yeşim and Sultan have poor mathematical skills, observed behaviors of these students are not directly related to general characteristics of learning disability.

Discussions, Conclusions and Suggestions

It is determined that these Yeliz and Sultan do not have full knowledge of mathematical concepts in scope of acquisitions, but they do not have much difficulty in doing the relevant operations and can find the correct answers through interventions. Bryant et al. (2008) suggest that interventions at tier 2 increase reasoning of numbers and performance in arithmetic of students having difficulties in math. It is thought that these students are skilled in these operations, since they solved a great number of exercises in similar operations in the past. However, it is understood that this high number of exercises has not helped in gaining conceptual knowledge. It is observed that these two students are able to apply rules of operations and do addition, subtraction, multiplication and division with natural numbers and they do not have much difficulty in learning conceptual information. However, it is also determined that, even though interventions supported with concrete materials have been made, they have not fully learned the concept of digits yet. It is a fact that students' understanding of the concept of digits and developing strategies to solve the given problems will improve and become deeper in time and, in teaching these concepts, use of materials like abacus, base blocks, cubes etc. is useful (Kaplan, 2008; Arslan, Yıldız, & Yavuz, 2011; Yenilmez & Demirhan, 2013).

It is known that, according to RTI model, two students considered to be in tier-2 (pre-orientation) category in the beginning were not at the expected success level during tier 1. However, it is not certain that these students are in need of special education and it is seen that their mistakes were generally caused by incomplete and incorrect information and, after appropriate interventions were made, they could correct these mistakes. Even though they had certain background information about concepts, they could express this information with math language. Students, who are content with explanations most of the time, need intervention at these points. It is observed that students, who generally hesitate to use math language in their class, act comfortably during support educations. It is understood that students' self-confidence (mathematical and verbal) increase through the communication they use and improve during support educations and, accordingly, they reflect their increased courage on general classes. To sum up, although Yeşim and Sultan have poor mathematical skills, it is determined that observed behaviors of these participants are not directly related to general characteristics of learning disability. Fuchs and Fuchs (2005) suggest that RTI provides an ideal diagnosis as an intervention and evaluation process where progress-monitoring data are used to systematically monitor student development and take decisions on teaching modifications.

In light of the foregoing results, use of a RTI model approach in teaching is effective for students, who are considered to have SEN, to learn math. In consequence of implementation of this model, it is concluded that students, who were considered to have SEN in the beginning, are not actually in need of special education. It is observed that, when interventions fitting to needs of students are made within the scope of general boundaries of education, deficiencies may be eliminated and academic achievement of students in math can reach to the same level as their peers (Ölmez, 2015).

Van De Walle et al. (2013, pp. 97) suggest that students with SEN have specific strengths and weaknesses, despite their deficiencies, and there are ways to support these students in all stages of planning math lessons, teaching math and evaluating results. However, they express that certain strategies including students' thinking aloud, visual and graphical representations of problems, peer-supported learning activities, formative evaluation data, open strategy teaching must be used for teaching at tier 2, and use of these strategies are also recommended by NCTM.

For students up to the 5th grade, math learning is structured by primary school teachers. In Turkish education system, students meet a math teacher in the 5th grade for the first time and, in terms of method, go through a math education different from the years of primary school. Each participant of this study was the student of a different primary school teacher and, therefore, encountered different teaching approaches. Considering their age level, it is understood that such changes have made a negative impact on math learning of students. It is observed that low academic achievement, which is caused by different teaching methods, of students with SEN mostly come out at the level of 5th grade.

Neal (2010) expresses that variability of teaching methods due to change of teachers has a direct influence on learning at small ages. Besides, Zembat (2007) associates low academic achievement of students, as one of the reasons, to teachers' poor and inadequate conceptual analysis in certain learning sub-domains of math.

In this study, two students who are considered to have SEN are taken as the focus. However, there are a lot more similar students in the school. Since it is determined in the study that two students, who were considered to have SEN in the beginning, were not actually in need of special education, it is assumed that, among other students, there are also ones who are not in need of special education. Use of RTI model may assure to identify such students in a better way and take preventive measures for academic failures.

In this study, it is assumed that students' difficulty in gaining mathematical acquisitions occur in the primary school and this mostly reveals itself in the 5th grade. The reason may be the intensity of data obtained at the 5th grade level and, accordingly, extent of the impact of the grade level being different on the study could not be predicted, but it is assumed that there may be a relation. From this point of view, use of RTI model at different grade levels is recommended.

For the acquisition "they can do multiplication of two natural numbers, where the product is a natural number with maximum five digits", it is preferred in support educations to ensure that the product has maximum four digits or multipliers are small numbers. It is observed that, through this adaptation, students could work more independently and focus on the main idea. Accordingly, it will be beneficial if teachers adapt acquisitions to students who are considered to have SEN.

According to experiences gained in the research, students with SEN generally get low marks in ordinary classes and this chronic situation leads them to undertake a passive role. Therefore, it is recommended for teachers not to give marks while (compared to standards) trying to obtain information about the level of students, who are considered to have SEN. It is observed that these students often make mistakes in operations with numbers with more than two digits. If the lesson is built on operation skills, it is recommended to use easy numbers in small group lessons. Participants having difficulties in following up verbal expressions cannot do a fluent reading, swallow certain words or syllables, cannot understand problems and cannot follow up instructions. For this reason, it is recommended to use short and clear instructions and mathematical sentences.

References

Altun, M. (2006). Matematik öğretiminde gelişmeler. *Uludağ Üniversitesi Eğitim Fakültesi Dergisi*, *19*(2), 223-238.

Argün, Z., Arıkan, A., Bulut, S., & Halıcıoğlu, S. (2014). *Temel matematik kavramların künyesi*. Ankara: Gazi Kitapevi.

Arslan, S., Yıldız, C., & Yavuz, İ. (2011). Basamak değeri kavramının öğretim durumlarının incelenmesi. *e-Journal of New World Sciences Academy Education Sciences*, *6*(1), 490-507.

Bingölbali, E., & Özmantar, M. F. (2012). Matematiksel kavram yanılgıları: Sebepleri ve çözüm arayışları. In *İlköğretimde karşılaşılan matematiksel zorluklar ve çözüm önerileri* (pp. 1-30). Ankara: Pegem Akademi.

Bryant, D. P., Bryant, B. R., Gestern, R., Scammacca, N., & Chavez, M. M. (2008). Mathematics intervention for first and second grade students with mathematics difficulties: The effects of tier 2 intervention delivered as booster lessons. *Remedial and Education*, *29*(1), 20-32.

Bryant, D. P., Bryant, B. R., Gersten, R. M., Scammacca, N. N., Funk, C., Winter, A., ... & Pool, C. (2008). The effects of tier 2 intervention on the mathematics performance of first-grade students who are at risk for mathematics difficulties. *Learning Disability Quarterly*, *31*(2), 47-63.

Chidsey, R. B., & Steege, M. W. (2010). *Response to Intervention. Principles and strategies for effective practice*. London: The Guilford.

Clements, D. H., & Sarama, J. (2007). Effects of a preschool mathematics curriculum: Summative research on the building blocks project. *Journal for Research in Mathematics Education*, *38*(2), 136-163.

Dede, Y., & Argün, Z. (2004). Starting point of mathematical thinking: The role of mathematical concepts. *Educational Administration in Theory & Practice*, *39*, 338-355.

Delaware Department of Education. (2010). Delaware Department of Education. Retrieved from http://www.doe.k12.de.us

Durmuş, S. (2007). Matematikte öğrenme güçlüğü gösteren öğrencilere yönelik öğretim yaklaşımları. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, *8*(13), 76-83.

Fidan, E. (2013). *İlkokul öğrencileri için matematik dersi sayılar öğrenme alanında başarı testi geliştirilmesi* (Master's thesis). Ankara University, Institute of Educational Sciences, Ankara.

Fuchs, D., & Fuchs, L. S. (2001). Principles for the prevention and intervention of mathematics difficulties. *Learning Disabilities Research & Practice*, *16*(2), 85-95.

Fuchs, D., & Fuchs, L. S. (2005). Responsiveness-to-intervention: A blueprint for practitioners, policymakers and parents. *Teaching Exceptional Children*, *38*(1), 57-61.

Fuchs, L. S., Fuchs, D., & Karns, K. (2001). Enhancing kindergarteners' mathematical development: Effects of peer-assisted learning strategies. *The Elementary School Journal*, *101*, 495-511.

Fuchs, L. S., Fuchs, D., Compton, D. L., Powell, S. R., Seethaler, P. M., Capizzi, A. M., ... & Fletcher, J. M. (2006). The cognitive correlates of third-grade skill in arithmetic, algorithmic computation, and arithmetic word problems. *Journal of Educational Psychology*, *98*(1), 29-43.

Glesne, C. (2012). *Nitel araştırmaya giriş* (A. Ersoy & P. Yalçınoğlu, Trans.). Ankara: Anı.

Griffin, S., & Case, R. (1997). Re-thinking the primary school math curriculum: An approach based on cognitive science. *Issues in Education*, *3*(1), 1-49.

IRIS. (2014). Center Peabody College Vanderbilt University Nashville. Retrieved from http://iris.peabody. vanderbilt.edu/module/rti

Johnson, K. (2007). A response-to-intervention (RTI) model for mathematics: Description, illustration and some data. Retrieved from http://apbs.org/Archives/Conferences/fourthconference/Files/Kent_J.pdf

Kaplan, H. A. (2008). *An examination of 8th grade students' construction about 'place' and 'place value' concepts* (Master's thesis). Gazi University, Institute of Educational Sciences, Ankara.

Kavsaoğlu, Z. S. (1993). Öğrenme güçlükleri. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi*, *26*(2), 6001-607.

Khan, S. (2013). *Evaluating the effectiveness of response to intervention in ela and math for sixth, seventh, and eighth grade students* (Master's thesis). Louisiana State University, USA.

Kırcaali İftar, G. (1998). Özel gereksinimli bireyler ve özel eğitim. In *Özel eğitim* (pp. 3-13). Eskişehir: Anadolu Üniversitesi Açık Öğretim Fakültesi.

Kroesbergen, E. H., & Van Luit, J. E. H. (2003). Mathematics interventions for children with special needs: A meta-analysis. *Remedialand Special Education*, *24*, 97-114.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. California: SAGE.

Ministry of National Education. (2013). *Milli Eğitim Bakanlığı, ortaokul matematik dersi (5, 6, 7 ve 8. sınıflar) öğretim programı*. Ankara: MEB.

National Center for Education Statistics. (2003). *The condition of education*. Washington DC: Department of Education.

National Center for Learning Disabilities. (2013). What is RTI?. Retrieved from https://www.rtinetwork.org

National Council of Teachers of Mathematics. (2000). Principles for School Mathematics. Retrieved from https://www.nctm.org/standards/content.aspx? id=16909

Neal, S. M. (2010). *Student academic growth in mathematic sthrough teacher practices in tier 2 response to intervention: A mixed methods study* (Doctoral dissertation). Austin State University, USA.

Olkun, S., Akkurt Denizli, Z., Kozan, S., & Ayyıldız, N. (2013, May). *İlkokul öğrencileri için matematik dersi geometri ve ölçme öğrenme alanlarında başarı testi geliştirilmesi*. Paper presented at XII. Ulusal Sınıf Öğretmenliği Eğitimi Sempozyumu, Adnan Menderes University, Aydın.

Ölmez, Y. (2015). *A review on effectiveness of RTI model on math learning of 5th grade students in need of special education* (Doctoral dissertation). Gazi University, Institute of Educational Sciences, Ankara.

Özyürek, M. (1981). Öğrenme güçlükleri. *Eğitim ve Bilim*, *6*(31), 32-37.

President's Commission on Excellence in Special Education. (2002). *A new era: Revitalizing special education for children and their families*. Washington, DC: United States Department of Education.

Ritchey, K. D., Silverman, R. D., Montanaro, E. A., Speece, D. L., & Schatschneider, C. (2012). Effects of a tier 2 supplemental reading intervention for at-risk fourth-grade students. *Council for Exceptional Children*, *78*(3), 318-334.

RTI Action Network. (2014). Learn about RTI. Retrieved from http://www.rtinetwork.org/learn/what/whatisrti

Sophian, C. (2004). Mathematics for the future: Developing a head start curriculum to support mathematics learning. *Early Childhood Research Quarterly*, *19*(1), 59-81.

Strauss, A. L., & Corbin, J. M. (1998). *Basics of qualitative research: Techniques and procedurs for developing grounded theory*. Sage Publications.

Topbaş, S. (1998). Öğrenme güçlüğü gözlenenler. In *Özel eğitim* (pp. 55-73). Eskişehir: Anadolu Üniversitesi Açık Öğretim Fakültesi.

U.S. Department of Education. (2008). The final report of the national mathematics advisory panel. Washington, USA.

Ünay, E. (2012). *The effects of the resource room instruction of mainstream students on math achievements and self-efficacy* (Doctoral dissertation). Dokuz Eylül University, Institute of Educational Sciences, İzmir.

Van De Walle, J. A., Karp, K. S., & Bay-Williams, J. M. (2013). *İlkokul ve ortaokul matematiği: Gelişimsel yaklaşımla öğretim* (S. Durmuş, Trans.). Ankara: Nobel.

Vaughn, S. (2010). Response to intervention for middle school students with reading difficulties: Effects of a primary and secondary intervention. *School Psychology Review*, *39*(1), 3-21.

Yenilmez, K., & Demirhan, H. (2013). Altıncı sınıf öğrencilerinin bazı temel matematik kavramları anlama düzeyleri. *Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisi*, *20*, 275-292.

Yıldırım, A., & Şimşek, H. (2006). *Sosyal bilimlerde nitel araştırma yöntemleri*. Ankara: Seçkin.

Zembat, İ. Ö. (2007). Sorun aynı-kavramlar; kitle aynı-öğretmen adayları. *İlköğretim Online*, *6*(2), 305-312.