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A Qualitative Study for The Evaluation of The 1-4. Classes' Mathematics Curriculum Content in Terms of Spiral Program Approach[1]

Research Article

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ABSTRACT

The main purpose of this research is; to evaluate the content of the primary school mathematics curriculum according to the teachers' views in terms of the spiral approach. It was aimed that the content of the new mathematics teaching program put into practice in the primary school was evaluated according to the teachers' opinions in terms of the spiral approach, and the contribution to the filling of the space in this area and contribution to the works to be done was aimed. Because of the lack of studies about the evaluation of the primary education mathematics curriculum in terms of content editing approaches when the field is examined in summer. Assessment of the mathematics program at primary school level (1st, 2nd, 3rd and 4th grade) will lead to more specific results. Making the work in the real teaching environment through teacher opinions will contribute to the validity of the study. The research is a screening model and a qualitative study. The evaluation of the elementary mathematics curriculum content in terms of spirality was evaluated in terms of the principles of "repeatability as the place gets closer", "gradual expansion", "associating new learning with preliminary learning" principles. In this evaluation, the learning areas of the curriculum, the relations between the subjects in these learning areas and the concepts in the achievements are emphasized.

Keywords:
Curriculum, mathematics, content, spiral programming approach

Introduction

In the rapidly developing world, social, cultural, economic and technological changes are experienced, as a result of these changes, humanity faces with new and different problems. With this process, it is necessary

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to develop human resources and train individuals ready for the future life conditions, equipped with the new skills besides adapting themselves to the modern world by satisfying their own needs. Realization of this fact is possible with the education, one of the most important components of education system and more specifically the curriculum. Human rights defenders qualify education as a way of nationalization and restructuring for the states while accepting education as a structure that takes the responsibility of integrating individuals to the society and making their lives much more meaningful. According to sociologists, it is a tool for increasing the awareness of socialization. (Vegas ve Petrow, 2008). In this context Turkish National Education System aims to increase the prosperity and happiness of Turkish citizens and Turkish society; to support and accelerate economic, social and cultural development in a national unity and integrity and finally to make the Turkish nation a constructive, creative, elite partner of modern civilization. (Ministery of National Education, 1973). The curriculums of all the lessons with all dimensions and components, notably in mathematic lessons starting from primary schools to pre-university educational institutions are structured to realize this goal. These curriculums have to be renewed in themselves in order to adapt to the changes all over the World. As a matter of fact, there was a need to change the curriculum of the primary school math's lesson with "the social and political encouragement arising from innovation and also mathematical factors, educators" (Howson, Keitel & Kilpatrick, 2008). The curriculum was changed onwards July 18 2017, started to be applied at schools in 2017-2018 academic year.

There are researches about the curriculum of mathematic lesson in Turkey in terms of periods in which the curriculums were changed and started to be applied. It is clear that the mathematic curriculum is examined from the stand point of subjects and the contents (Uysal ve İncikabı, 2017), the process of learning and teaching(Bekdemir ve Baş, 2017; Sevimli ve Kul, 2015),the viewpoints of teachers and students(İskenderoğlu ve Uzuner, 2017), the general characteristics (Özmantar, 2017), the evaluation /assessment of the mathematic lesson and also mathematic curriculums are compared with each other in these researches. There is not any research examining in terms of the content of primary school mathematic curriculum renewed and implemented in 2017. When the primary school mathematic curriculum changed in 2017 and started to be applied in 2017-2018 academic year has been examined, it is showed that the curriculum is structured into two fields as "Primary school mathematic lesson "(1st-4th class) and "Secondary school mathematic lesson "(5th-8th class). It is clearly seen that the curriculum does not include a vision but also adopts a thematic, student-centered and unit-based approach. Teachers have flexibility chance about the approach they use in the sections of "overall objectives of the curriculum" and "values education in the curriculum" it ıs emphasized that teachers should decide which approach is more efficient and apply/use it. There are 13 items in the section of the curriculum "objectives". In 2017, 9 basic skills were emphasized in the mathematic curriculum but in the content 17 skills were determined to be acquired. In 2017, it was seen that 10 values were included /added into the" values" section of the curriculum for the first time but the interdisciplinary approach fell into disuse. 13 items were listed under a title as points to consider in the implementation/application of the curriculum. Primary school mathematic curriculum is created as "a whole" having its own characteristics with putting different disciplines together but ultimately it is not only a collection of these disciplines. At he same time with being open to interdisciplinary interaction the curriculum is designed with a content consisting not only the target/ objective but also the process/path. In mathematic learning and teaching process, students' expressing their own ideas verbally has an importance at understanding, interiorizing and configuration of the mathematical notions/concepts (MEB, 2017).

The curriculum is a program designed to provide the students with knowledge and skills, which are generally composed of certain categories of knowledge and which focus on skill and practice in some schools, in line with the objectives of the training program and in a planned manner. It covers all activities related to teaching-learning processes; the course program is the whole (Küçükahmet, 2009). The curriculum includes the objectives, content, learning experiences and evaluation/assessment items. The content item designed

according to the objectives is one of the important dimension of the program and if the organizing approach is not chosen according to the quality of the knowledge, the desired efficiency cannot be obtained (Demirel, 2011). The spiral approach improved according to Bruner's "spiral learning" theory and also one of the approaches for designing the curriculum content is effective in integrating the subjects and activities that require continuity into the program and processing the new subjects being related to the previous learning and connecting with the basic subject (Sönmez, 2004). In this type of program, the content does not follow a linear order, with the horizontal linkage the subject is associated with the new knowledge and the preliminary information in a deepening and expanding manner in the same teaching process. The subject is distributed over the years in a deepening and expanding manner with vertical linkage. There is a sequence in each subject within its subjects, the subjects that will be learnt and the learning process are under control. (Demirel, 2010). It is clear from this point of view that regulation of the content and the understanding under this arrangement for the efficiency of the program are important factors.

It can be said for 2017 primary school mathematic curriculum that it has a student -centered and regarding conceptual understanding viewpoint. It can be said that the curriculum highlights the correlation of 8 key competences identified in the Frame of Turkey Qualifications (FTQ) and the values such as flexibility, aesthetics, equality, justice and sharing with appropriate acquirements. From this aspect primary school mathematic curriculum includes a learning process students perceive the knowledge by discovery and construct the knowledge in the form of the problem-discovery-hypothesis-validation-generalization-association in their minds. In order to functionalize this process and the subjects learned to remain in memory for a long period of time, being involved the spirality factor indicated in the program with its horizontal and vertical linkage features into the mathematic curriculum and being considered the spirality feature of the program content by the teachers are quite important. Teachers' consciousness of the spirality approach that is one of the organizing approach is important for the teachers to question the content of program draft, to see negative and positive aspects of the content spirality, to ensure looking the content from different perspectives. In this context, it is necessary to determine primary school teachers' views about spirality organizing approach that is one of the 1st-4th classes mathematic curriculum content element's designing.

There are not any research about the new content of the primary mathematic curriculum because the primary school mathematic curriculum renewed in 2017. The fact that the deficiency will be eliminated with this study, will increase the importance of the research. In addition, the teachers' views about the content of the primary school mathematic curriculum will be examined qualitatively and deeply, also the spirality feature of the curriculum will be revealed.

Problem Sentence

What are the teachers' views about editing the content of the primary school mathematic curriculum in terms of spiral approach?

Subproblems

1)What are the characteristics of the content of primary school mathematic curriculum in terms of spirial approach?

2)What are the views of the teachers about the content of primary school mathematic curriculum?

3)According to teachers' views, how is the content of primary school mathematic curriculum in term of the spiral approach?

Research Objective

The main purpose of the research is to evaluate the content of primary school mathematic curriculum in terms of spiral approach according to teachers' point of views. It is considered that evaluating the content

of the new mathematic curriculum applied in primary schools in terms of spiral approach according to the teachers' views can both fill the gap and contribute to the studies that will be done in this field. When the literature reviewed it is noticed that there are limited number of studies especially about the primary school mathematic curriculum in terms of content editing approaches.

Evaluating the mathematic curriculum in primary school level (1st,2nd,3rd,4th classes) will provide obtaining much more specific consequences/results. Holding the research through teachers' views in a real learning environment will contribute to the validity of the study.

Method

Research Model

This research, in which the evaluation of the contents of primary school mathematic curriculum spiraling is aimed, is a screening model and qualitative study. The studies that aim to pick the opinions of a particular group about a specific subject are described as screening research (Büyüköztürk at all, 2008). Screening models are research approach that aim to describe a stuation in the pas tor at present with its current position. In this model, the individual or object that makes up the subject of the research is tried to be defined as it is in its own state (Karasar, 1999).

Study Group

The primary school teachers, who work at a primary school located in the periphery of Burdur Province in the 2017-2018 academic year, participated in the study voluntarily. The registration area of this school is the first settlement area of the families who have migrated from other regions of Turkey and from outside the country. Therefore, it is a primary school that can be considered as socially disadvantaged, where the children of families with low educational and economical level are educated. As there was a branch at each grade level in this primary schoolthat is based on volunteer participation, it is limited to do the research on just four teachers. The teachers included in the study were coded as T1, T2, T3 and T4. T1 has twenty-two years seniority, T2 is twenty-two years seniority, T3 is thirty-nine years seniority, and T4 has twenty seven years seniority.

Data and Gaining Data

Interview and document review technique was used to obtain qualitative data. In order to determine the opinions of teachers about the evaluation of the content of the mathematics curriculum in terms of spiraling, the interview form was used to examine the program designe within the same aim. Teachers' views on the current situation were taken; it is not intended to determine the level of difference between teachers' opinions or the reasons for their opinions. The reason for using interview and document review for the same purpose is to diversify data sources and methods, to increase the reliability and validity of the results achieved, and to obtain more scientific inferences by linking data from two data sources.

Questionnaire obtained based on "reproducibility", "increasingly expansion" and "associating new learning with pre-learning" principles of the subject that reflects the spirality characteristic of the content of the mathematics curriculum in the application of the interview technique has been used (Çakır, 2014). The process of creating and analyzing the question expressions was evaluated by Mehmet Akif Ersoy University, Institute of Educational Sciences, Faculty Educational Programs Development and Teaching within the scope of qualitative approaches in the scientific research process and contributed to the opinions of the lecturer as field experts. The opinions of the participants were taken in writing in the form of the questions. Then, interviews were made with the same questions by face to face individual interview technique. The interviews with the participants were conducted in a quiet and comfortable environment by the researcher in the schools

where the teachers worked. In the interview, probing questions were identified in order to prevent deviation from the purpose of research and to provide in-depth information. Probes are statements that enable the interviewee to give more detailed answers or to make additional explanations (Yıldırım & Şimşek, 2013). In order to increase the reliability of the interview and also to prevent data loss, the interview was recorded on the digital recording device with the permission of the interviewed individuals. The mentioned written forms and records were translated by the researchers after the meeting and the examinations were carried out through these documents. During the analysis of the data, the participants were interviewed for the second time and the opinions were added to the written section. The interview statements in written form were sent to the participants in the mail environment and feedback was received for the correct transfer of their statements.

After collecting data through document review, it is determined where to obtain these documents after determining which types of documents will be used to respond to the problem and sub-problems of the research (Yıldırım & Şimşek, 2013). In order to be able to respond to the sub-problem of the study, the Primary Education Curriculum of the Ministry of National Education (MoNE, 2017) prepared by the Board of Education of the Ministry of Education has been investigated in terms of the helicality of the program content by being scanned in both width and depth. As the subject area of the research was limited to the primary school 1-4th grade class mathematics curriculum, only Elementary Mathematics Lesson Curriculum which was published by the Ministry of Education (2017) was used in the document review.

Analysis of Data

The analysis of the data obtained from this study was done by content analysis. The purpose of content analysis is to combine the relating concepts, maket hem meaningful and comment them (Yıldırım & Şimşek, 2013). The findings obtained from the data sources have been tested through examination, investigation and inquiry processes. In this research, the process of analyzing the data obtained through document analysis, preparing and editing the data for analysis, reading and examining the data, determining the codes and themes and interpreting the findings consist of (Creswell, 2007). Firstly, descriptive data were collected and the data collected for teacher views was defined by document analysis for primary school mathematics curriculum content. These data were classified in the second stage for coding. The themes created in this categorization are as described in the previous section and the codes related to them are given in Table 1.

Table 1. Themes and Codes

Themes	**Codes**
Features of Primary School Mathematics Curriculum	The succession of subjects
	From easy to difficult
	From simple to complex
	Repetitive
Reproducibility	To be related with the previous subject
	In the same year, no repeating
	In the different year, repeating in
Increasingly expansion	In the same year, no expanding
	In the different year, expanding in
	Expanding without repeating
	Relation in

Associating new learning with pre-learning	Relevant to the subject of the previous year	
	No repeat of previous subject	

Findings

In this study, which aims to determine the opinions of primary school teachers about spiraling features of the content of the mathematics curriculum, the findings are presented in this section. The findings of semi-structured interviews and document analysis were analyzed and interpreted by making direct quotations from the participants' views.

Features of Primary School Mathematics Curriculum

In the research, firstly the question "What are the features of primary school mathematics curriculum in therms of the spiraling approach?" was tried to be answered. When the primary school mathematics curriculum is examined in terms of content structure, it is determined that four learning areas are determined as "numbers and operations", "geometry", "measurement and data processing"; these areas are seen in six units. In this program, where a unit-based approach was adopted, the achievements were placed in six units and the teacher was advised to plan for the pre-lesson course on mind. Within the scope of these units, it is seen that there are a total of 229 acquisitions, including 36 at first class level, 50 at second grade level, 72 at third grade level and 71 at fourth grade level. Some explanations have been made for some of the achievements, some of which have been explained and examples of events are given. Lesson hours are set on a class-by-unit basis and are set for a total of 180 hours per class. Evaluation; recognition, follow-up, result-oriented, and peer evaluation are presented as a method. The evaluation of the content of elementary mathematics curriculum in terms of helicality, and the evaluation of the knowledge in terms of "reproducibility", "increasingly expansion" and "associating new learning with pre-learning" principles. This evaluation focuses on the learning areas of the curriculum, the issues in the learning areas and the concepts related to achievements. In the structure of the curriculum of primary school mathematics curriculum, the concept of spirality was not included in any way. In the explanations to be taken into consideration in the implementation of the program, it was emphasized that, in addition to giving flexibility to teachers, determining the previous learning of the students and building their new learning on the previous concepts. In this respect, it can be said that the winding approach of the content of the program carries the principles of "reproducibility" and "increasingly expansion". The explanation for this is on page 18 of the program (MEB, 2017 s:18):

"*Teachers are given flexibility in the determination of the teaching approach and in the organization of learning environments, provided that they remain within the framework of the proposals and achievements of the program.*

Students' previous learning should be identified, and activities that support effective learning should be offered to students to build new mathematical concepts on previous concepts and students should be encouraged in this process."

The four learning areas that make up the primary school mathematics curriculum are given at each class level, while some sub-learning areas are introduced after a certain class. The numbers and operations started to take place in the first class according to the concepts in the learning area, subjects and achievements as figures from the second unit and numbers up to 20 and as ranking, decimal and unity work. The concept of addition and subtraction in the third unit, as addition and subtraction process; the fourth unit was included in the discovery. In the second class, numbers and operations were expanded by learning area, subjects and gains, from the first unit up to 100 geniş readings, and as numbers from less than 100; In the second unit, the unattended and manual collection, the decoding process requiring or not requiring decimals, continued as problems in the third unit, and in the fourth unit as multiplication and division concepts. In the third grade,

numbers and operations started with three-digit numbers starting from the first unit by expanding the learning area, subjects and gains. Roman numerals, three-digit numbers and addition and subtraction operations were also included in the same unit. The problems in the second unit continued with the multiplication and division by two-digit numbers in the third unit. In the fourth class, 4, 5 and 6 digit numbers in the first unit, addition and subtraction with these numbers, in the second unit problems, in the third unit with three-digit numbers are included as division and division operations. The relationship between whole and half fractions in first grade; second, half, and quarter relationship; the concept of fraction in the third class with part-whole relation; in the fourth year there are simple, compound and integer fractions and introduction to addition-subtraction procedures. According to this, the subjects of the program are expanded according to years and the subject of the next year is built on the subject of the previous year. Although it does not repeat in the same year, it is observed that it has expanded again in the following year.

Geometry of learning, as assessed by using the concepts in positions and shapes triangle geometric objects and achievements in the fifth unit in the first class, square, rectangular and circle display, identification, name, according to the number of edge-corner located as classification. In the second class, the sixth unit is the subject of the circle, while in the third grade the subject is expanding with the cube, square and rectangular prism in the fifth unit. In addition, the faces, corners and edges of geometric objects are included. In the fourth grade, the fifth unit includes drawing of these figures using ruler and determining their diagonal. Spatial relations in the first class; direction and movement along the second grade; in the third and fourth grade, the symmetry of the geometric objects was drawn. On page 14 of the curriculum, it is stated that basic concepts are discussed after the third year considering the students' readiness, and that the new learning is included in relation to the previous learning:

"The lower areas of learning basic concepts in geometry, addressing the students after 3rd grade readiness of mind, thought to be appropriate. Students point, line, ray, as part of their right to express more abstract concepts by recognizing the environmental angle and are expected to give examples. In the 4th grade, the students are expected to recognize the plane, to illustrate, to determine the edges and corners of the angle, to name and classify the angles."

In the primary school mathematics teaching program about measurement subject; length, money, time measurement, weighing and liquid measurement are obtained in the 1st and 2nd grades, while measurement and environmental measurement are included in these titles in the third grade. Recognition of these concepts, conversion into units within them and solving problems related to them are included in the grade-level gain. There are also gains for associating the square and rectangle with the multiplication and addition process. In this respect, topics are repeated in the content order and associated with previous learning.

In the area of data processing, the subjects were included in the first year by associating the numbers and operations with the learning area and the gains were prepared in two dimensions. The first of these is "teaching data" and the second is "creating, interpreting tables and graphs". In the first class at most two data sets with simple reading tables, data collection for a research question given in the second class, data tables, and object to interpret whether represented by a graph, to read to prepare the frequency table and figure charts, with a maximum of three data sets in the third grade simple tables It is expected to read, interpret and edit the data obtained from the table. In the fourth grade, it is aimed to examine and form the column graph.

The Views of Primary School Mathematic Teachers About Curriculum Content

The content of the curriculum of elementary school mathematics teacher to have taken their views concerning the question of what characteristics and evaluated. Teachers' opinions are as follows:

T1: "*As the program content, topics row, from simple to complex, from easy to difficult, moving from the abstract to the concrete. But in practice only staying in knowledge. Application level remains missing. The sequential arrival of the topics is also very much between years.*

T2: *"The topics are listed consecutively in the program. But this ranking exists between years. From simple to complex, from somt to abstract. For example, rhythmic counting before the collection process, to predict the results, and then making process of the mind, is progressing as transaction processing and problems. As in going from easy to difficult problems are correct. This is the way in the same year and the issues between the years is moving in this way. In this respect, it also fits into learning theories. However, the gains remain at the level of knowledge. Behavior can not be translated"*

T3:*"The program is ranked from easy to difficult, but it never comes again.*

The program appears as a helix content, the order of the issues in this way, but in practice not spiral. A subject is being processed and left"

T4:*"The content should be from easy to difficult. These are the topics listed in the mathematics program. But the topics taught for a year in a class is not related to each other. You're goig on a new subject after teaching the last one. A top state of a subject, is placed in a higher grade. There are one-digit numbers in the 1st grade, two-digit in the 2nd grade, and three-digit numbers in the 3rd grade. If the child didn't learn the two-digit numbers in the second grade, it ended. In the third grade, he cannot learn three digits. You don't have the chance to do that again, according to the program. Because the extra time is needed and the important problem is that the program did not give it."*

It was seen that teachers either directly or indirectly used the concepts related to the program content. They emphasized in the program that the subjects should be consecutive, easy to difficult, simple to complex, repeat, and a subject should be related to the previous topic. In the current program, it was stated that the subjects were sequential, easy to difficult, from simple to complex.

Evaluation of Primary School Mathematics Curriculum Content in Terms of Spiraling Program Theory According to Views of Teachers

The opinions of the teachers about the properties of the elementary mathematics curriculum in terms of the spiraling approach were taken and these views were evaluated based on the principles of "reproducibility", "increasingly expansion" and "associating new learning with pre-learning". They believe that all of the teachers in the evaluation of the primary school mathematics curriculum in terms of "reproducibility", the subjects are not repeated in the same year and they are repeated the following year. Their statements are as follows:

T1:*"Within the program, it is necessary to relate the subjects as they come, to associate with the previous learning. In the mathematics program it does not repeat. The subject is being processed and finished. Moving to a new topic. Then this issue does not take place again throughout the year. Or the time when it comes to planning a new topic on this issue can not be included again. So I repeat it myself, except the program, here I do not fit the program This time is not enough time. I'm taking time from other lessons. There are so many issues already, I'm just trying to give knowledge. No opportunity to practice, nor to give the child a chance to explore…"*

T2: *"In the same year the knowledge needs to be repeated as the place arrives. The student completes the points that he/she does not learn and learns the new topic more easily. But in the same year, the topic is going to be done, the new topic is passed and this issue does not come back again in that year.*

I go out of the plan and go back to the beginning and I repeat the topic before the new topic. That's why time isn't enough and the lessons don't catch up."

T3:*"Subject are individual throughout the year. That's OK, you teach the collection, then it goes to subtract. One is not completed before the other, but this is the pre-learning of the next year. In the same year, this issue is not included. The next year, we recognize that the child has learned this, but many have forgotten about it. In this case, the child has difficulty learning the subject and hates mathematics."*

T4:*"There aren't repetitions for the same year. There are repetitions for different years. For example, in the second class, there is a two-digit numbering operation, and in the third class there is a three-digit numbering operation. It's a spiral. But there's no repeat of the two digits. We assume that students know. And if student doesn't, it's not gonna know. That's why I repeat the subject. But this isn't in the program.*

Subjects need to be repeated as they come. But in the program it does not exist again over the year. I do this repetition myself. Because as I said, if the child has not learned the two-digit numbers completely, or has forgotten until the next year, he cannot learn the three digits. In this case, the course time is not enough."

When the opinions of the teachers are evaluated in terms of "increasingly expansion" principle, it is stated that once a subject is completed again within the same year, it does not take place again, and that the same subject is included as an upper learning in the following year. The teachers' statements are as follows:

T1: *"The program have repetiton but this is for the next year. It also comes to expand the subject. It is accepted that the student has learned the subject in the previous year. If he didn't, it's hard. To avoid this, I have to repeat."*

T2: *"This year's subject is again in the next year, but further expanding. It is directly involved in the repetition of the previous year. In this case, I have to do it again, even if it is not included in the program.*

Subjects do not repeat or expand in the same year. The subject is being processed and it is not coming back. The next one begins.

Subjects are expanding over the years. This is good from one point of view; students with good development can improve themselves better. Bad aspect; The student who forgot the subject of the previous year, who is not good at the background, has difficulty in learning the upper level or fails. In this respect, it is important again next to enlargement."

T3:*"The subjects in the program are coming in succession. But according to the year. Not in the same year. For example, in october I am processing the addition. It ends. Don't go back to addition. Then the extraction, multiplication, division four operations are finished. Then the solving problems continue. The next year, addition becomes harder and more complicated. But without the repetition of the previous year. Subject, according to the years and rank of the class, is expanding; it gets harder, but in the same year there is no such thing. Processing and ending."*

T4: *"An upper case of a subject is in a higher class. There are one-digit numbers in the 1st grade, two-digit in the 2nd grade, and three-digit numbers in the 3rd grade. If the child didn't know the two-digit numbers in the second grade, it is so hard. In the third grade, he cannot learn three digits. You don't have the chance to do that again, according to the program. Because the extra time is needed and it's a problem.*

The subject remains in the year when it was processed. The next year we are processing again in a wider manner."

When the views of the teachers are evaluated in terms of "associating new learning with pre-learning" principle, it is stated that the subjects and the achievements in the program are associated with the previous learning, but that new learning on a subject is included in the next year, in a higher class. The teachers' statements are as follows:

T1: *"Learning is easier if a new subject is relevant to the previous subject. However, in a classroom, we process the subject, we finish it, and we do not return to that subject again, or repeat it again. It takes place again in the following year, making it harder and wider. Naturally, new learning is not going back to the previous one. During the year, independent subjects are interdependent between years. But the time schedule in the program does not repeat."*

T2 :*"The current program recognize the student learn the subject in the previous year. The students who are missing the lower level, not gain their dominance on the subject in the upper echelons. However, when the teacher realizes this and repeats it, the subject becomes clear.*

It's nice and important to relate new learning to pre-learning. Thus, subject that require continuity are included in the program. However, a prior learning in the program takes place unrepeated, remains missing."

T3: *"In the new curriculum, it is aimed to provide new learning based on the old learning and to make appropriate learning for the students.*

Here I would like to point out that when we are trying to give new skills to the students, we lose a lot of time by reminding and re-working in order to make sense of knowledge.

For example, students who learn to multiply in 2nd and 3rd grade have difficulty in multiplication with 2,3,4 digit numbers in 4th grade. We have to go back to class 2 and 3 again. This time, the acquisition of the 4th class gains in time is prevented. For this I think that the time allocated for the mathematics lesson should be increased."

T4: *"An upper case of a subject is in a higher class. There are one-digit numbers in the 1st grade, two-digit in the 2nd grade, and three-digit numbers in the 3rd grade. If the child didn't learn two-digit numbers fully in the second grade, it is very difficult. In the third grade, he cannot learn three digits. You don't have the chance to do that again, according to the program. Because the extra time is needed."*

Discussion and Conclusion

This research, which aims to evaluate the content of primary school mathematics curriculum in terms of spiraling, is a qualitative study in screening model. Interview and document review technique was used to obtain qualitative data. In the application of the interview technique, the questions obtained based on the principles of the subject reflecting the spiraling of the content of the mathematics curriculum have been used as "reproducibility", "increasingly expansion" , "associating new learning with pre-learning". Cakir (2014) in the study, the aim of that is to investigate English language teaching curriculum content of the 6th, 7th and 8th level, from the perspective of the teacher views and curriculum design, for the purpose of evaluation of the themes formed in the analysis of the data has been found as "reproducibility", "increasingly expansion" , "associating new learning with pre-learning". Our research on the spiraling of the content of the mathematics program complies with the themes created by this research for the spiraling of the content of the curriculum.

The study group of research consists of four classroom teachers working in the primary school determined on a voluntary basis. Since there is a branch at each grade level in this primary school, it can be considered that this number decreases the scope validity of the study as the number of teachers interviewed is limited to four. In this study, gathering data from interview and document analysis is considered that the study of the content of the primary school mathematics program is not only addressed in terms of subjects but also the study of the subjects within the scope of the learning areas and acquisitions in the units increases the scope validity of the research.

According to Demirel (2010); spiraling is an approach based on the learning of repetitive learning situations as time and place of learning. Each repetition of content is given in depth, abstraction and complexity. This arrangement is used in the case of a sequence between the sub-topics of each subject. Previous learning is the basis of subsequent learning. Concepts are organized in depth and relational. Each subject is distributed to time and class according to the succession in itself. The subjects are organized in each class by opening and deepening. Subjects are organized from simple to complex, easy to difficult, concrete to abstract, special to general, away from time and environment, and prerequisite principles when spreading over years. It can be said that the subjects are sequential according to the learning areas and achievements, and that the new learning is associated with the previous learning, as a result of the interpretation of the data obtained with the question expressions obtained based on the principles of the subject reflecting spiraling of the primary school mathematics curriculum as " reproducibility", "increasingly expansion" , "associating new learning with pre-learning". Again, the subject is expanding by years; again, it can be said that it is ranked from simple to complex, easy to difficult, concrete to abstract, special to general and far away from the environment. It is also seen that the repetition is between years and there is no repetition in the same year. In this respect, it can

be said that the content of the primary school mathematics curriculum carries the feature of spiraling in many aspects.

On the other hand, it has been observed that the concept of "spirality" is not included in the structure of primary school mathematics curriculum. In the explanations to be taken into consideration in the implementation of the program, it was emphasized that, in addition to giving flexibility to teachers, determining the previous learning of the students and building their new learning on the previous concepts. Ersoy (2006) investigated the mathematics curriculum at primary level in terms of purpose, content and achievements. In this study Ersoy; in 2005, the content of the primary education mathematics program is based on the spiral approach, content editing is made in this direction, therefore, four learning area (numbers, geometry, measurements, data) in the basic concepts of each class is discussed and tried to knit as a rope, it has been found that the relative depth of knowledge, understanding and skills has increased and the scope has expanded. In this respect, it can be said that although the findings of the study conducted by Ersoy (2005) show similarity, it is stated that the content of the program content has a helicality, although it is not stated in the content of the curriculum that 2017 elementary mathematics curriculum content is taken as the basis.

When the teachers were evaluated according to their opinions, it was seen that the teachers directly or indirectly used the concepts related to the program content. They emphasized in the program that subjects should be consecutive, from easy to difficult, simple to complex, repeat and a subject should be related to the previous topic. In the current program, it was stated that the subjects were sequential, easy to difficult, from simple to complex.

According to all of the participating teachers' opinions; elementary school mathematics curriculum is not repeated in the same year, is repeated in the next year of assessment in terms of "reproducibility". It was observed that a subject was not repeated once again after it was processed during the year, therefore new learning could not be associated with the previous one, and they interpreted what they did in cases requiring repetition as non-programmatic.

When the content of the program is evaluated in terms of "increasingly expansion" principle of spiraling approach, it is stated that once a subject is completed in the same year, it does not take place again. In this case, it can be said that the expansion is not in the same year according to the opinions of the teachers and it is included as a higher level of learning among the years.

When the views of the teachers are evaluated in terms of "associating new learning with pre-learning" principle, it is stated that the subjects and the achievements in the program are associated with the previous learning, but that new learning on a subject is included in the next year, in a higher class. Therefore, this association is not in the year, but between years. However, it is stated in the section where the explanations about the learning areas of the program are related to the gains in other subjects during the year (MEB, 2017, p.15). In this case, the description in the program varies with the teachers' opinions.

In addition to determining the ideas of the content of the elementary mathematics curriculum in terms of the spirality or content of the curriculum, it is possible to carry out the phenemological researches in which they think about what they think in this way. Interview technique was used as a method of data acquisition. This can be achieved by adding observation to obtain more in-depth data. It would be useful to include similar studies in secondary education and other courses, including the curriculum, and even include the views of students.

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