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DIFFERENTIATING THE CORRECTIVE INSTRUCTION IN THE LIGHT OF STUDENTS' REFLECTION

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Abstract: This study focuses on students' reflections on their prior learning, action plans generated by them, and the corrective instructional design process. The concern that initiates the beginning of this action research is two folds: on the side of students, to maximize students benefit from corrective instruction and on the teacher's side, being more aware of the students' lack of knowledge regarding related concepts in mathematics. This action research study is performed in three steps: Students' reflection on their current situation related to prior mathematics learning as a base for their prospective learning, a process for generating an action plan for corrective instruction and implementation of an action plan based on those evaluations. Besides, it aimed to give teachers a basis for the design of the next stage of instruction. The study's significance of prior learning on the effectiveness of new learning in mathematics offers concrete suggestions on how to design corrective instruction in light of students' reflections and action plans. For the theory of practice, both the process and the study results will provide valuable information for teaching mathematics.

Key words: Action research, design of instruction, mathematics education, prior learning, reflection

1. Introduction

1. 1. Students learning of mathematics and mathematics curriculum

Students learn in a variety of different ways and have different interests. However, there are some common issues that students use while learning mathematics. One of them is to use their existing knowledge in new learning processes (Beane & Brodhagen, 2001; Beier & Ackerman, 2005; Gatewood, 1973; Wolfe & Goldman, 2005). In other words, while learning new things, we construct this from prior learning (Baki, 2015). When the new information is coinciding with learning schemes existing in our mind, constructing new learnings on those existing learning schemes becomes easier.

It is not surprising that "from the known to the unknown principle" is the most well-known among the several learning theories; further, this is an essential element in the mathematical learning process as per developmental psychology principles. Conceptual learning, which has an important place in mathematical learning processes (Altun, 2001, Van de Walle, 2013), regards mathematics as "a network of interconnected concepts and ideas" (Baki, 2015, p.261). Students' success will be tremendous if they consider mathematics through its conceptual structure (Porter and Masingla, 2000). The extent of the students' networks of thought is established, linking prior knowledge and new knowledge.

The mathematics curriculum has its structure and includes interconnections. Thus, mathematic learning is most closely associated with the concept of "helical structure," as conceptual learning can be achieved by building on prior learning (Altun, 2001; Romberg, 2000; Sabean & Bavaria, 2005), and the intention is to make students construct new learning based on their prior (e.g., Baki, 2015; NCTM, 2000). Fundamental shortcomings in the students' prior learning lead to more significant deficiencies as time progresses and this, in turn, is a strong correlation with the program's helical structure. In this respect, teachers are expected to regard deficiency of prior knowledge and skill accumulation.

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The learners' understanding of fractions or the related procedural stages may affect other learning at that grade level or later, since the learning of fractions takes place in the program every year, with appropriate extensions. In the National Mathematics Program (MoNE, 2013; MoNE, 2017), the concept of "fraction" starts at the first-grade level or kindergarten with the concept of sharing and continues through to rational numbers at seventh grade. It can also be used frequently in other learning areas, such as length measurement, probability, graphing, and ratio. That is why the lack of learning on this concept has a negative influence on the learning of related concepts. This situation is right for many other concepts in mathematics.

1. 2. Differentiating the mathematics instruction

Some students encounter learning in most elementary classrooms; others are above the grade level, while the rest fit somewhere in between. A major problem of traditional instruction is that many teachers "teach to the middle" (Haager & Klinger, 2005, p. 19), meaning that the needs of a growing number of students are not met. In light of national and international programs' vision based on the consideration that each student can learn mathematics (MoNE, 2013; MoNE, 2017; NCTM, 2000), targeted planning is needed that considers students' individual learning needs. In this respect, the "teacher should start with what students know, not what he knows" (Baki, 2015, p. 350). This argument can be used for corrective studies as well.

Teachers confront with the challenge of creating an environment in which all students' needs can be met (Greenspan, 2005; Tomlinson, 2000; VanTassel-Baska & Stambaugh, 2005). When the case is the different knowledge levels of students, it is valid for corrective studies. Differentiation makes teachers authorized to be responsive to the unique and individual personalities, backgrounds, and abilities found within students, and it involves proactive planning, based on assessment and comprised of a mix of whole-class, group, and individual instruction. (Tomlinson, 2001). Thus, differentiation might be a solution for the design of regular instruction and for planning for corrective instruction to fix students' learning needs regarding previous learning processes.

Thus, this action research study aimed to investigate how to design corrective mathematics instruction by starting with what the students know. Therefore, in this action research study, which has twofold, one of the aims, was to modify and differentiate the corrective instruction in the light of students' reflection on their learning. Thus, the study investigated the students' reflections related to their prior knowledge to form the ground for their new learning, their action plans related to lack of their learning, and how to use this information when designing appropriate corrective instruction. Simultaneously, the researcher had the students participate in a reflective process in which they assessed their prior learning.

2. Method

2. 1. Research design

This action research study was performed by a researcher working as a teacher of seventh-grade mathematics courses. Action research is often used to investigate specific issues or problems associated with classroom or school life (Stringer, 2008). Here, a specific issue is planning for the corrective instruction in the light of student reflections. This research is also designed for the action research study to enhance students' awareness about their learning process and progress. This study aims to identify students' reflections on their prior learning; action plans generated by them, and analyze the corrective instruction process's design. Thus, the research questions of the study are:

1. How the students reflect on their prior learning in mathematics?
2. Which action plans do students generate regarding their learning deficiencies and lack in previous learning?
3. What kind of a corrective instructional design should be made to eliminate students' deficiencies in their previous learning?

As some of the prior learning discussed in the study was conceptual and some were procedural, the prior learning was taken as a whole, but it is limited by the name of concepts or topics, terminology related to those concepts, and teachers' explanations related to that concept. In line with the aims, the study was conducted in several steps:

1. Making a self-assessment on prior learning
2. Creating an action plan according to the results
3. Using the results of those reflective thinking processes in designing the corrective instruction.

In the study, the action research model developed by Kemmis (1980) based on Lewin's work was implemented. Accordingly, the generated workflow is as in Figure 1.

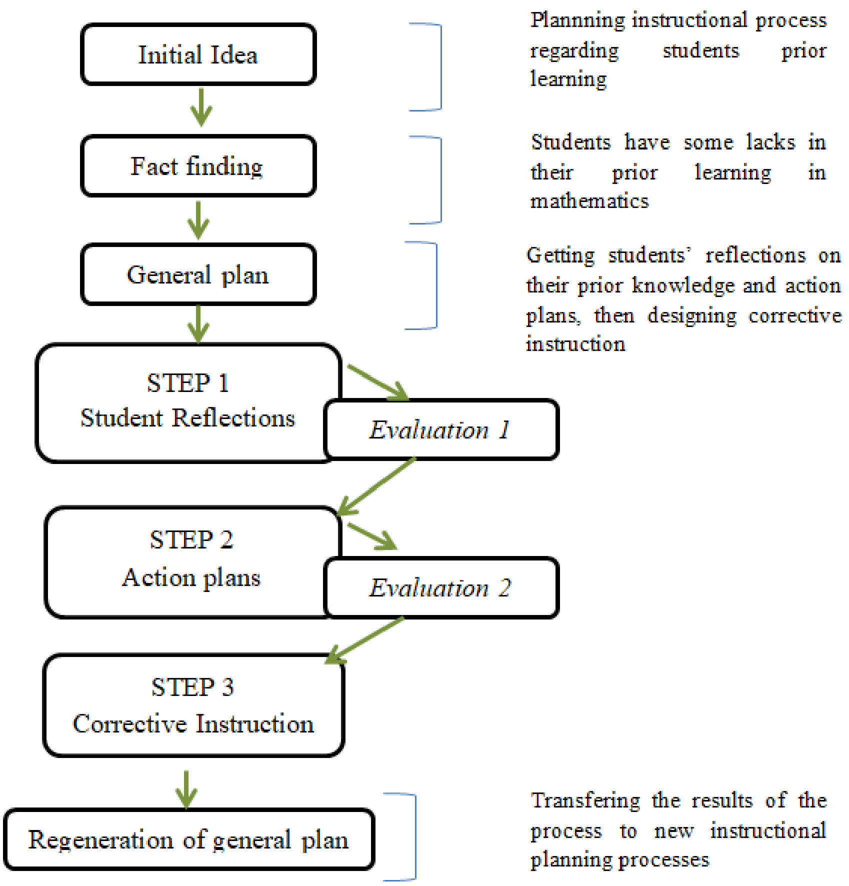

Figure 1. *Workflow of the study*

In Figure 1, Step 1 is making a self-assessment on prior learning. After this self-assessment process, the results are organized and used in Step 2, creating an action plan according to this self-assessment process. Then in Step 3, which uses the results of those reflective thinking processes in designing the corrective instruction, the design process results are discussed.

2. 2. Participants and the Research Site

The study was conducted with 70 seventh-grade students attending a school affiliated to one of Ankara's education foundations in Turkey. The school prioritizes learner-centered education and implements the national curriculum based on the perspective of international programs. The students were generally the children of university staff or parents with high educational or socioeconomic status. In each class, the total number of students was similar.

2. 3. Data collection

2.3.1. Data collection instruments

The students reflect on their prior learning via a single document Self-Assessment, and Action Plan Form (SAAPF) was prepared as follows by the researcher:

1. Determination of the eighth-grade contents defined in the MoNE curriculum.

2. Sketching out which prior learning was related to the achievements in the eighth-grade curriculum.

3. Examination of "learning trajectory" studies performed on international mathematics programs and revision of the draft content list.

4. Formation of the SAAPF and checking by experienced mathematics teachers and mathematics teacher candidates.

5. Preparing the final draft of the SAAPF.

The list of prior learning was prepared in the light of "learning trajectory" studies in the literature (Confrey, Maloney & Nguyen, 2011; Cross, Woods & Schweingruber, 2009; Sarama & Clements, 2009) and on the several years of experiences as being a mathematics teacher. The frequently used resource in the study was the "Turn-onCCMath" (https://turnonccmath.net) project performed by a group of academics from North Carolina State University. The SAAPF was designed by creating different tables according to the eighth-grade curriculum; thus, the prior information required for some eighth-grade subjects may also belong to another learning area. For example, while learning the "triangles" concept in the eighth class, it was necessary to use the knowledge related to "integers," which is a concept included in "numbers and operations." Figure 2 shows a sample from the SAAPF.

Eighth grade curriculum	Which prior learning is related to this subject?	How do you evaluate your current level of learning? (Please score between 1 and 4)	What is your action plan for these issues? (Please write a separate action plan for the sections you gave 1, 2, and 3 points.)
Factors and multiples	Prime numbers (sixth grade)		
	Prime factorization (sixth grade)		
	Divisibility (sixth grade)		

Figure 2. *A sample from the SAAPF*

The SAAPF was examined by an experienced mathematics teacher who has been teaching mathematics at various grade levels at the middle school for 13 years. Besides, an expert from the education field analyzed the form in terms of format and content. As a result, the SAAPF found appropriate, except some minor corrections were proposed regarding the format. The total number of content and processes was 31 as prior learning of different subjects from the eighth-grade curriculum. Among those, 14 were in the numbers and operations learning area, 5 in algebra, 3 in data, and 9 in geometry and measurement. In the application process, the researcher gave information about essential understandings as examples for each sub-learning area.

In the mathematics program (MoNE, 2013) actively being used during the study, the probability learning area occurs for the first time in the eighth grade. The researcher assessed the four primary operational skills in new learning related to probability. Table 1 lists the titles of the content and processes related to prior learning by only indicating sub-learning areas.

Table 1. *Prior sub-learning areas list for eight grade subjects*

1. Exponents	17. Height
2. Prime numbers	18. Angle bisector
3. Factorization	19. Inequalities
4. Divisibility	20. Absolute value
5. Simplification	21. The position of the point on a coordinate plane
6. Integer operations	22. Coordinate system
7. Decimals	23. Transformational geometry
8. Fractions	24. Similarirty
9. Rational numbers	25. Ratio
10. Linear relationship	26. Polygons
11. Linear equations	27. Circle and circular area
12. Angles	28. Volume
13. Drawing graphics	29. Range
14. Ordering numbers	30. Frequency table
15. Four operations	31. Operations with fractions
16. Triangle	

2.3.2. Data collection process

As an activity of Step 1, The researcher applied the SAAPF. The first session focused on the self-assessment part only and to score the prior learning from 1 to 4 for each content or process. At the beginning of the process, the researcher said that participation in this study is voluntary. In addition to this, participating in such a study would not have any positive or negative effect on the seventh-grade mathematics course grades. In the SAAPF, one = 'I do not remember at all,' two = "I have to review," three = "I am good, but I have to do some further studies," and four = "I am very good at this content or process." Before starting, the researcher asked whether they needed further explanation, and the discrimination between the points was clear enough. The students indicated that there is no need for an additional explanation for both questions. They were also reminded that prior learning related to one of the eighth-grade subjects might also be associated with the others.

After the students completed the self-assessment part, the forms were collected and examined by the teacher to evaluate Step 1. The researcher highlighted the subjects given 1, 2, and 3 points with different colors so that students could focus more easily on gaps in their prior learning while preparing their action plan. Also, students' responses were analyzed, and the the researcher determined the frequencies of the results. In Step 2, the forms were re-shared with the students during the next lesson, and they were asked to create separate action plans for the contents and processes they gave 1, 2, and 3. The researcher asked students to use short, clear, and concise expressions in the action plan and specify specific information, such as time and content. Then the evaluation of the second step was performed by the teacher. The third step was identifying elements in the light of student reflections to be used in decisions related to the corrective instructional design process.

2. 4. Data analysis

Data related to them each step of the study analyzed separately:

1. A frequency table was prepared regarding self-assessment scores, and the distribution of the data was analyzed from different perspectives.
2. Common points and prominent differences in the action plans were analyzed.
3. The teacher's actions from the study results and their reflections on the instructional design process were collated.

The results first two cycles were classified under appropriate categories of corrective instruction plan. In each step, teachers' reflective notes were used to sustain the study's flow throughout the steps.

3. Results

3. 1. Reflections and self-assessments related to prior learning

In the first cycle of the research, the aim was to make students reflect on their prior and related learning. The results of this process on prior learning according to learning areas and sub learning areas were given in Table 2.

Table 2. *Assessments according to areas of learning in the SAAPF*

Content	Numbers and operations	Algebra	Data	Geometry and measurement
1 point	1.29	2.2	0.67	1
2 points	6.64	6	3	4
3 points	20	15.2	9	13
4 points	42.07	46.6	57.3	46

In all areas of learning, the students gave a maximum of 4 points. Data was the learning area given 4 points by most students and numbers and operations the least. Almost the same number of students gave geometry and measurement, and algebra learning areas 4 points. In the learning areas given 3 points, numbers and operations were given 3 points by most students and data the least. Almost the same number of students gave geometry and measurement and algebra learning areas 3 points. In the learning areas given 2 points, numbers and operations were given 2 points by most students and data the least. Almost the same number of students gave the algebra and numbers and operations learning areas 2 points. Fewer students gave 1 point for any learning area. In the learning areas given 1 point, algebra was given 1 point by most students and data the least. Almost the same number of students gave the geometry and measurement and numbers and operations learning areas 1 point.

For each learning area, almost 60 students gave 3 or 4 points. It was also possible to analyze the situation in the sub-learning areas, concepts, and processes by looking at them separately in this context. Table 3, Table 4, Table 5, and Table 6 present specific content in each area of learning. For all learning areas, if the number of students who gave 4 points was less than 40, that content was defined as the priority area, if it was between 40 and 50, then it was defined as the second priority area, and if it was over 50, then it was defined as the third priority area. Table 3 shows the number of students according to the numbers and operations learning area's points.

Table 3. *Distribution of points according to content in the numbers and operations learning area*

Content	1	2	3	4	5	7	8	9	15	20	25	31	$\bar{X}$
4 points	40	31	31	50	55	38	43	37	54	36	41	51	42
3 points	26	20	23	17	12	26	22	26	10	24	19	16	20
2 points	3	16	13	2	3	5	4	10	6	7	9	3	7
1 point	1	3	3	1	0	1	1	2	0	3	1	0	1

According to Table 3, most of the students needed to review the prime numbers and factorization concepts. Exponents, fractions, ratios, and proportion concepts were the second priority for revision.

Table 4. *Distribution of points according to content in the algebra learning area*

Content	10	11	19	22	$\bar{X}$
4 points	43	47	42	49	47
3 points	17	19	14	14	15
2 points	6	4	11	6	6
1 point	4	0	3	1	2

According to Table 4, none of the content in algebra was covered by the first priority area. However, linear relations, linear equations, inequalities, and the coordinate system were in the second priority area.

Table 5. *Distribution of points according to content in the data learning area*

Content	13	29	30	$\bar{X}$
4 points	58	58	56	57
3 points	10	6	11	9
2 points	2	5	2	3
1 point	0	1	1	1

When we look at the sub-topics in the data learning area in light of Table 5, most of the concepts, such as graphs, range, and frequency were remembered. In this context, these contents were not included in first and second priority areas.

Table 6. *Distribution of points according to content in the geometry and measurement learning area*

Content	12	16	17	23	26	27	28	$\bar{X}$
4 points	49	51	50	60	53	43	35	46
3 points	20	14	13	6	15	17	22	13
2 points	1	5	7	2	2	8	8	4
1 point	0	0	0	2	0	2	5	1

Table 6 indicated that volume was included in the first priority area, and angles, circles, and circular areas were included in the second priority area for the geometry and measurement learning area. Triangles, height, transformational geometry, and polygons were included in the third priority area. In the geometry and measurement learning area, transformational geometry was the most remembered subject among the sub-subjects in all learning areas. Prime numbers and factorization in the numbers and operations learning area were the subjects that students remembered least. The content in the priority areas is summarized in Table 7.

Table 7. *The content in the priority areas according to the learning areas*

	First priority area	**Second priority area**	**Third priority area**
Numbers and operations	Prime numbers Factorization Rational numbers	Exponents Fractions Ratio	Divisibility Simplification Four operations Operations with fractions
Algebra	-	Linear relations Linear equations Inequalities Coordinate system	-
Data	-	-	Drawing graphs Range Freqency table
Geometry and measurement	Volume	Angles Circle and circular area	Triangles Height Transformational geometry Polygons

3. 2. Action plans according to the self-assessment results

In light of the self-assessments, the students prepared action plans for the areas they awarded 1, 2, and 3 points. Table 8 shows the different methods generated by the students.

Table 8. *Methods determined by the students*

Method number	Method
1	Recaptulating the subject
2	Solving multiple choice questions
3	Relating the mathematical concept to everyday life
4	Getting help from family members
5	Solving the questions of an activity on a worksheet
6	Working on lecture notes
7	Reviewing from course book
8	Working from internet sources
9	Passing over solved questions
10	Using Moodle
11	Focusing attention
12	Getting support from a private tutor
13	Compiling questions from different sources

Table 9 shows the frequency of the students' preferred methods.

Table 9. *Frequency of the students' preferred methods*

Method number	3: I am good but I have to do some further studies	2: I have to review	1: I do not remember at all
1	2	-	-
2	63	20	9
3	2	-	-
4	9	2	3
5	5	1	1
6	24	22	6
7	6	9	2
8	5	8	2
9	-	-	1
10	2	-	-
11	2	-	-
12	3	2	2
13	2	1	-

The second and sixth methods, namely solving multiple-choice questions and working on lecture notes, were the most preferred. Solving multiple-choice questions was the most preferred method by the students overall. Besides, when the students preferred more than one method, solving multiple-choice questions and working on lecture notes were the chosen combination. As seen in Table 9, some methods were preferred by only one or two students, such as passing over solved questions, using Moodle, and focusing attention. Passing over solved questions was preferred for the consolidation of subjects that were not remembered at all, and using Moodle and focusing attention were preferred for the activities related to point 3. Some methods were preferred in the action steps for each level. For example, solving questions on worksheets, in an activity, was found in action plans that correspond to self-assessments at all three levels. It was also seen that students had developed one or more methods. Table 10 shows how many methods were preferred by the students.

Table 10. *Number of preferred methods and number of students*

Number of methods	3: I am good but I have to do some further studies	2: I have to review	1: I do not remember at all

1	21	9	2
2	30	19	8
3	12	6	3
4	-	-	-
5	1	-	-

As seen in Table 10, students preferred at most two methods at each of the three assessment levels. Only one student preferred five different methods, and no students preferred four methods at once.

3. 3. Designing corrective instruction in the light of student reflections

The teacher defined the first, second, and third priority areas for complementary activities as "studies to be done for the whole class," "studies to be done as a group," and "studies to be done individually." Table 11 shows the sample analysis chart prepared by the teacher.

Table 11. *Analysis chart for action plan*

Studies to be done for the whole class (first priority area)	**Studies to be done as a group (second priority area)**	**Studies to be done individually (third priority area)**
Prime numbers Factorization Integer operations Rational numbers Absolute value . . .	Group 1: Simplification Group 2: . . .	S1: 3: Factorization Linear equations Triangles Height Volume 2: - 1: -

According to the analysis chart, the teacher planned to conduct a complementary study for the whole class when the number of students who gave 4 points in self-assessment was less than 40. When the number was between 40 and 50, different groups were formed to review the concepts as a group. Finally, studies were to be carried out for the individual needs where more than 50 students gave 4 points in the self-assessment. The teacher preferred different strategies and methods for these different types of studies. For example, one of those strategies was to allocate time for the review of prior learning before the new related learning in the eighth-grade program. Activities were planned, such as giving pre-tasks, determining the readiness, and using expert groups to help students remember their prior knowledge.

In the second priority area, creating different groups for the topics, giving pre-tasks to the groups, creating complementary studies for the needs of the groups at lunchtime, setting separate time slots for different topics, ensuring that only the students participate who need to review that part, were some strategies that the teacher considered and planned to use. Figure 3 shows an example related to participants in group work.

Group 1: Simplification

Students: S8, S10, S11, S14, S16, S22, S23, S28, S37, S40, S42, S53, S55, S63

(Underlined students, S22, S53 and S55 gave 2 points to simplification in their self-assessment.)

Figure 3. *Example of a section on the SAAPF*

For the students' individual needs, studies were planned individually in the time they determined and with their methods. The teacher's role was to check their progress, give feedback, and record the results. The teacher had a copy of the students' action plans and created a chart to track individual complementary studies, to be used starting from the first week of the eighth grade. Figure 4 shows an example of such a follow-up chart.

	Subjects to be covered	Methods	Situation and reccomendations
S1	Factorization (3) Linear equations (3) Triangles (3) Height (3)	Making a recap of the subject (1) Solving multiple choice questions (2)	
S2	. .		

Figure 4. *Follow-up chart of individual studies*

The subjects planned to be covered by the whole class in the chart indicated with a single line. The subjects to be covered as a group indicated with double lines. For example, for S1, factorization should be covered by the whole class, linear equations should be covered in groups, and “triangles” and “height” should be covered individually.

Discussion

Self-assessments regarding prior learning showed that the students have the most deficiencies in the numbers and operations learning area. The students gave the highest points about their prior learning to the data learning area. One of the reasons for this may be that concepts in this learning area included visual elements, the content was related to real life, and learning those concepts supported students from different perspectives. When the sub-topics were examined in some cases, transformational geometry was given the highest score. One of the reasons might be that since the content includes visual elements, it was presented to the students with an art-related theme. Another reason may be that the topic had been completed recently.

The students had the lowest scores on self-assessment regarding factorization and prime numbers topics. These were the first and second topics of the first period of sixth grade, respectively. Assuming that almost two academic years had elapsed, the students' deficiencies in their prior learning might be related to time, and it might be relevant in particular for the concepts not sufficiently covered in the learning process. According to the results of the self-assessment, the students determined thirteen different methods for their action plans. As indicated by Elliot (1991), for students, reflection initiated action and action initiated reflection. Therewithal, in the second part of the study, the students' steps in their action plans can shed light on the most preferred mathematical learning process strategies. This result can be used for teachers and prospective teachers who want to support their prior learning gaps in this context. While evaluating the results obtained, the teacher's action steps were prepared by the teacher in response to the different needs in various learning areas. Additionally, such a study presents concrete suggestions and examples for a mathematics teacher's reflective thinking process.

Many of the methods were in line with effective mathematics learning strategies in the literature (e.g. Cai, Moyer and Wang, 1997; Wood and Wood, 1996). One of the remarkable results was that students preferred solving multiple choice questions more than other methods. Especially considering the scores on levels 1 and 2, thinking about using this method without having a conceptual understanding is questionable. Notwithstanding this, it is worth noting that these preferences were mostly made by students with low achievement levels, although it is not within the scope of this study. Besides, it was seen that students often tend to use more than one method. The most preferred methods were working on the lecture notes and solving multiple choice questions. It is possible that the use of multiple methods at the same time and in the appropriate order might be supportive in providing conceptual understanding.

In the light of student reflections, the teacher started to plan for corrective instruction with essential tips regarding students' current situation. As a general culture, students were familiar with that kind of self-assessment process. Therefore, their self-reported lacks in their prior knowledge seem to be valid data about their perceptions. Besides, the data kept throughout the year related to students' learning support these statements' validation. The teacher defined the students' problems due to the prior learning and designed a corrective learning process as a practice. Teachers should try to respond to students' learning needs with individualized help and maximize this help according to students' needs (Guskey, 2007). Action research is a form of inquiry that "enables practitioners everywhere to investigate and evaluate their work" (McNiff and Whitehead, 2006, p.7). The teacher's action plan was developed by taking the students as a whole class, as a group, or individually, in light of the differentiation principles and their needs. Initial implementation of these corrective studies has transformative potential for the design of the next action research and instructional processes.

It is also worth mentioning some points that can illuminate future research work. This study may provide a guiding framework for action research in every grade of mathematics. Additionally, an analysis of a differentiated corrective instructional process can be designed due to this study. However, there are some limitations. The study was conducted with 70 students who were familiar with self-assessment when considering the entire instructional process. Besides, the teacher was investigative, experienced, and reflective and was familiar with such processes. Thus, both performances of students and teachers should be considered within this context. Another limitation is that the prior learning list defined in the SAAPF was limited to the subject, concept, or process titles and explanations of the teacher. Even if the students were familiar with the concept, they might not have enough learning to consider details. With this, the SAAPF form should be utilized in that way. In this study's scope, the teacher prepared an action plan by knowing the students for a long time.

From the application point of view, the study can shed light on the tools used in practice and how the results can be handled for more considerable work to be done with all class levels. In this context, the SAAPF used in the transition from seventh to eighth class can be used as an example for in-service and prospective teachers in planning such a study. Furthermore, the study gives suggestions about how it is possible to define the National Mathematics Program's scope and sequence (MoNE, 2013; MoNE, 2017) as learning trajectories that emphasize the horizontal and vertical relationships of the concepts. In this regard, networks or learning trajectories will form a practical guideline for teachers who want to complement the gaps in students' prior learning.

Conclusion and Implications

The role of teachers in teaching is to support students to be self-automated learners. As a way of achieving this, teachers have an essential role in bringing students to the point where they need to be, in order to make students realize the importance of their previous learning in a spiral-based curriculum, to enable them to make self-assessments on these learning processes and to complete their learning deficiencies. In this study, the students took an essential step towards taking this responsibility and had the opportunity to reflect on their learning processes. The research provided explanations regarding the learning processes defined in the sub-learning area.

As an action researcher, the teacher aims to evaluate the work, modify and differentiate the corrective instruction in the light of students' reflection on their learning and research process future studies that measure the effectiveness of the results obtained after implementing the created plans. On the other hand, the current study process was valuable in terms of the implementation of action steps in the light of research at each stage. Based on the data emerging at all learning levels, the teacher planned whole class studies, group studies, and individual studies. In practice, this is a challenging task to follow such an action plan, as it requires a systematic follow-up and recording process. It is necessary that such planning is a requirement, not an option when teaching is started from where the student is. Notably, such instruction is indispensable for permanent and meaningful learning.

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