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REMEMBERING RATES FOR THE SUBJECTS WHO LEARNED IN THE SCIENCE LESSON

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Abstract:
The purpose of this research is determining the rate of recalling of science subjects for students completing basic education. The qualitative research method was used in the study. In this context, face-to-face interviews, fully structured interviews and documents were reviewed. Homogeneous samples were used in the study. The sample consisted of 48 people. In addition, 7 people were interviewed face to face. A fully structured interview form, face-to-face interview and document review were used to collect data. Both descriptive and content analyzes were used to analyze the data. In addition, percentage and frequency values were used in document analysis. As result of the analysis the subjects most remembered by the participants are respectively living things and life, matter and nature, physical events, world and universe learning fields. Number of acquisitions of learning subject areas is consistent with frequency values of recalled subjects obtained in research. The most remembered subjects in the science lesson are the systems, the characteristics of living things and nature. As a result of face-to-face interview, it was determined that the methods and activities used by teachers in the classroom were effective in remembering the subject.

Keywords: science curriculum, science lesson, learning subject areas, remembrance, student views, qualitative research

1. Introduction

Science lesson is a lesson that tells the person about world and beyond, the properties of matter, the characteristics of living things and physical events. Through this lesson the person learns the place in the universe, the substances around him, the activities of vitality and the physical events that occur in nature. In other words, gains the progress of the food it eats, the water it drinks and the smell of the air in to the body (Gülen, 2018a; Yildirim and Meteroglu, 2016).

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From elementary school age the person learns the science lesson, in this lesson, they use what they learn in their daily life (Gülen, 2018b; Gülhan and Şahin, 2016). The basic purpose of the science lesson is to enable the person to gain the means to cope with the most basic problems related to science, nature, universe, matter and living in his daily life (Çalık and Aksu, 2018). The science curriculum is also prepared for this purpose. The science curriculum focuses on five key learning subject areas. These learning subject areas are prepared according to a certain number of acquisitions and the lesson hours are determined accordingly. The aim is to obtain these acquisitions by the student within the specified hours (Polat and Baş, 2012). Below are the five main learning areas and their contents.

A) World and Universe

Students in this learning area; learn about the earth and its satellite, planets, stars and its properties, galaxies, universe and possible life situations. In short, they structure information about the world and beyond according to the class steps.

B) Matter and Nature

At this step; students learn the structure and properties of the material in detail starting from their environment.

C) Living things and Life

In this area which is quite large space; students learn animals, plants and people together with their characteristics. They also learn about characteristics of inanimate entities in nature. They get a lot of information about the human body.

D) Physical Events

This is the area of learning that has the highest number of acquisitions and lesson hours in the curriculum. Topics such as strength and properties, pressure, electricity, mass and weight, light and sound are discussed in this chapter.

E) Science and Engineering applications

This learning area was added to the curriculum with the change in 2018. There is no number of acquisitions yet, but the hours are given. However, it has been put in the last two weeks of education at all grade levels. The aim of these applications is to ensure that the effectiveness and experiments carried out throughout the year are exhibited within the scope of science festivals and to create space for STEM applications.

These five learning subject areas described above were prepared according to the data of Ministry of National Education (MoNE) (2018a; b). The person meets these areas of learning especially in the third year of school life and starts to use them in his daily life. In addition, the curriculum is continuously revised to keep pace with the developing era (Bakırcı and Kutlu, 2018). In addition to these subject areas, the science lesson also provides information about the basic functioning of science (Demir and Akarsu, 2013). Science lesson teaches the ways of reaching scientific knowledge and solving problems (Cangüven, Öz, Binzet and Avci, 2017). In general, it is suggested that the science lesson and the curriculum provide this information to the person (Fitzgerald and Smith, 2016). In addition, in some researches, it was aimed to evaluate the effects of science on education, teaching and technology (Sheldrake, et al., 2017). The aim of these studies is to evaluate whether the individual's target areas of learning reach their

achievements within the determined lesson hours (Shirazi, 2017; Yaman and Çakir, 2018). In this study, the level of recalling the targeted gains of the individual was investigated.

Acquisitions determine the level of learning subject areas in the curriculum, what knowledge, skills and concepts should be conveyed to persons and society. Research shows that science subjects and their acquisitions are more remembered level (Eke, 2018; Seheroğlu, 2014). This situation can be interpreted as aiming to be able to keep the subjects and acquisitions in the memory of the learning person. It is important that teachers who apply the science lesson according to the curriculum organize activities in this direction (Anagün, Kılıç, Atalay and Yaşar, 2015). An individual's recollection of science subjects will show that these acquisitions have reached their goal. Can person who have completed basic education remember science subjects? At this stage, teachers need to organize different activities in order to increase the level of remembering of subjects. In a study, it was found out that teachers preferred the homework for remembering science subjects (Gedik, Altıntaş & Kaya, 2011). The methods and activities used by teachers to comprehend and keep in mind the subject areas are important. Are the persons who have completed their basic education learned by what methods or activities?

The science lesson provides information that can be used in daily and academic life. Thanks to the lessons learned, the problems encountered in daily life are solved. In addition, thanks to the subjects learned in this lesson, knowledge about other sciences is acquired and the basis of the profession chosen in the future is created. Therefore, the subjects learned in the science lesson must be remembered and used by the individual. The level of remembering and using this information by the individual is important. In this study, the level of recall of the subjects learned in the science lesson of a group of students who completed their basic education was investigated. As a result of this research, got information about the subjects most remembered by the persons who completed the basic education, the ratio of these subjects with the targeted acquisitions and the reasons for remembering these issues as well as the methods and activities applied in teaching them.

1.1. Purpose of the research

The purpose of this research is determining the rate of recalling science subjects which students completing basic education. For this purpose, the answers to the following questions were sought.

1) What are the ratio of subject areas of science lesson according to lesson time and acquisitions?
2) What are the rates of remembering the subject areas of science lesson?
3) What is the comparative analysis of remembered subjects according to the number of acquisitions?
4) Which subjects are remembered most in science lesson?
5) What are the reasons for remembering the most remembered subjects?

2. Methodology

Qualitative research method was used in the study. This method is used to determine the causes of research questions (Glesne, 2013). In the content analysis conducted to ensure validity of the study, direct quotations were given and the accuracy of the research results was shown. In the reliability study, the situation of the sample group was explained in detail, the existing roles were explained, and the conceptual framework and data collection and analysis were presented. In addition, these data were supported by descriptive analysis (Yıldırım and Şimşek, 2013).

2.1. Participants

Homogeneous (analogous) samples were used in the study. The aim in the analogous sample is to determine the status of groups with similar characteristics in a subject in order to collect qualitative data effectively (Merriam, 2013). As a matter of fact, the research was conducted with the first-year students of the Vocational High School in Eastern Anatolia Region during the 2018-2019 academic years. Class size was determined to be 48. In addition, 7 of these participants were interviewed face to face. It was determined that the participants were from the same region and their socio-economic status was similar. These participants have completed their primary and secondary education.

2.2. Data collection tools

A fully structured interview form was used to obtain data from multiple participants simultaneously. Face to face interviews were conducted to determine the reasons for remembering the subjects. In addition, a document review was carried out to determine the number of subjects in the science curriculum and the number of lessons per hour (Yıldırım and Şimşek, 2013). Document review is considered as an objective way of analyzing and analyzing the data in the light of certain criteria (Çokluk, Yılmaz and Oğuz, 2011). A fully structured interview form has the following question: What did you learn in the science lesson during your their primary and secondary education?

In face-to-face interviews, the reasons for recall were questioned. In this context, the ways in which information was acquired and the methods and activities used by the teachers were questioned.

2.3. Analysis of data

The fully structured interview form data was coded and analyzed both descriptively and content. The face-to-face interview data was recorded and written to the content analysis. MoNE (2018a; b) documents are analyzed in terms of number of acquisitions and lesson hours and presented as percentage (%) and frequency (f) values. Participants are coded with numbers 1 to 48.

3. Findings

In this section, the data obtained in the scope of the research questions are presented in order.

3.1. Ratio of learning subject areas according to lesson hours and acquisitions

The science curriculum is placed on five main learning subject areas (MoNE, 2018b), which are presented in percentage and frequency values in Table 1, from 3 to 8 grades, according to the number of acquisitions and number of hours per lesson.

Table 1: Science curriculum subject areas and class level statistics

Subject areas	3.grade (f)		4. grade (f)		5. grade (f)		6. grade (f)		7. grade (f)		8. grade (f)	
	N.A.	L.H.	N.A.	L.H.	N.A.	L.H.	N.A.	L.H.	N.A.	L.H.	N.A.	L.H.
World and Universe	5	9	5	15	7	24	5	14	10	16	3	14
Matter and Nature	4	17	10	21	6	26	13	28	16	28	17	28
Living things and Life	11	24	8	24	9	32	22	42	15	34	25	46
Physical events	16	58	20	39	14	50	19	48	26	54	16	44
Science and Engineering	0	0	0	9	0	12	0	12	0	12	0	12
Total	36	108	43	108	36	144	59	144	67	144	61	144

N.A .= Number of Acquisitions, L.H. = Lesson Hours

Table 1 is based on MoNE (2018a: b) weekly lesson hours schedule and science curriculum. Table 1 shows the number of acquisitions and lesson hours according to the subject areas of the science curriculum. Accordingly, the science curriculum is based on five main subject areas. These subject areas are world and universe, living things and life, physical events, matter and nature, and finally science and engineering. As the number of acquisitions increases, the number of lessons hours increases. Table 1 shows 108 hours in the 3rd and 4th grades, and 144 hours in the 5th, 6th, 7th and 8th grades. The number of acquisitions varies by class level.

Table 2: Number of acquisitions and lesson hour's statistics according to science curriculum subject areas

Subject areas	Total (f)		Percent (%)	
	N.A.	L.H.	N.A.	L.H.
Physical events	111	293	36.75	36.99
Living things and Life	90	202	29.80	25.51
Matter and Nature	66	148	21.85	18.69
World and Universe	35	92	11.59	11.62
Science and Engineering	0	57	0	7.20
Total	302	792	100	

N.A .= Number of Acquisitions, L.H. = Lesson Hours

Table 2 shows the percentage and frequency values of the learning subject areas in the science curriculum. When we look at the subject areas in the curricula over the total

lesson hours, the first place is physical events with 36.99%. Afterwards, 25.51% of the subjects were living things and life, 18.69% of their matter and nature, 11.62% of the world and the universe, and the last with 7.20% of science and engineering applications.

3.2. Recall rates of learning subject areas

The results of the analysis of the responses of the participants to the fully structured interview form are shown in Table 3.

Table 3: Statistics of science curriculum according to participants' recall rate

Subject areas	Frequency (f)	Percent (%)
Living things and Life	105	68.18
Matter and Nature	32	20.78
Physical events	15	9.74
World and Universe	2	1.30
Science and Engineering	0	0.00
Total	153	100

Table 3 shows the frequency and percentage values of the subject areas remembered by the participants during their basic education. According to this, the most remembered are living things and life with 68.18%, matter and nature with 20.78%, physical events with 9.74% and world and universe subject areas with 1.30%.

3.3. Comparison the number of learning area acquisitions with remembered subject

The number of acquisitions in the learning subject areas and the frequency values of the subject areas that are remembered are compared as in Table 4.

Table 4: Comparison of the most remembered statements with the number of acquisitions

Number of Acquisitions			Remembering		
Subject areas	Frequency (f)	Percent (%)	Subject areas	Frequency (f)	Percent (%)
Physical events	111	36.75	Living things and Life	105	68.18
Living things and Life	90	29.80	Matter and Nature	32	20.78
Matter and Nature	66	21.85	Physical events	15	9.74
World and Universe	35	11.59	World and Universe	2	1.30
Science and Engineering	0	0	Science and Engineering	0	0.00

In Table 4, the learning areas in which the most remembered statements are found and the numbers of acquisitions of these learning areas in the science lesson are compared. According to the science lesson and curriculum, physical events with the highest acquisitions (36.75) are in the third rank according to the percentage of learning area remembering level. It should also be noted that although there is no number of acquisitions in the field of science and engineering learning, there is no such learning area during the basic training of participants. Apart from these data, it is seen that the number of acquisitions between the other learning areas is proportional to the recall values.

3.4. Most remembered topics

The relationship of the most remembered subjects in the science lesson with learning subject areas is presented below.

Table 5: Frequency values of the most repeated statements according to the learning subject areas

Order	Subject areas	Statements	Frequency (f)
1	Living things and Life	Systems	16
2	Living things and Life	Characteristics of living things	16
3	Living things and Life	Characteristics of nature	9
4	Living things and Life	Organs	9
5	Living things and Life	DNA structure	7
6	Living things and Life	Vegetation	6
7	Living things and Life	Human and features	6
8	Living things and Life	Heredity	6
9	Matter and Nature	Properties of matter	6
10	Matter and Nature	Acid-Base properties	4
11	Interesting	Experiments	9
12		Those who don't remember anything	6
13		Curious	1

Table 5 shows the frequency values of the statements that the participants remember the most. The subject areas of these statements are also indicated. Apart from these, a section which can be considered as de interesting has been added. The most repetitive first three are the systems (16), the characteristics of the living things (16) and the characteristics of nature (9). In addition, it was stated that some participants remembered doing the experiment (9). Apart from these, it is determined in the statements that do not represent the subject areas of science but which are important for the research. According to this; statements such as those who do not remember anything (6) and curiosity (1) have been identified.

A) The most remembered subjects in the science lesson

The topic-learning area relationship (Table 3) obtained from the classification of the subjects most remembered by the participants and the most commonly used statements (Table 5) are presented above. In addition to the descriptive data mentioned above, the content analysis codes and categories are presented below. The content analysis obtained from the fully structured interview form of the most repetitive statements under this theme is presented.

a. Systems

Quotations for systems in this category are presented below:

> *"There are 602 bones in the human body. The skeletal body is made up of a bone that allows the body to stand upright, the digestive system, excretory system." (K39)*

"The internal organs of people, the activities of the lung, the excretory system, the activities of the pancreas in."(K36)

"Digestive system, discharge system." (K20)

"I loved the subject of systems because I wonder more about what is going on in my own body."(K3)

The excerpts indicate that participants remembered "*bone and bone number*", "*digestion*", "*excretion*", "*internal organs*" and "*body*". It can be said that the participants remember the systems we have because they are curious. Similarly, the characteristics of living things are also remembered below.

b. Characteristics of living things

In this category, participants recall the general characteristics of vitality*:*

"...the creatures in nature are the way they live." (K45)

"I learned the life of the living things I learned from science lesson, which helped me to look at living things from a different angle…" (K19)

"…The common characteristics of living things are the basic components of living things." (K17)

"According to the law of nature, each living lives and lives in a subclass. If one species has more species, the balance is disturbed and the nature deteriorates." (K2)

The above excerpts are remembered by the "*living*" organisms, their "*common characteristics*", the "*classification*" and nutrition among the living things and their characteristics. As understood from the quotations, the characteristics of living things are remembered. It is shown below that nature's characteristics are remembered apart from the characteristics of living things.

c. Characteristics of nature

The nature and characteristics of the participants are presented below:

"Nature and natural events." (K6)

"I remember the nature and rules in the science lesson". (K23)

"I have learned how human beings are connected to life, the rules of physics in life and in nature." (K31)

"… nature and disasters in nature…" (K48)

It is understood that participants remember "*nature and events*", "*rules*" and "*disasters*". Participants remember the nature and features can be said.

3.5. Reasons for remembering topics

The most remembered subjects in the science lesson are indicated by the quotations above. At this stage of the study, it is investigated why these issues are remembered. Why are these subjects recalled within the subjects of science lesson? In addition, the reasons for the statements are interesting. For this reason, three people of the highest frequency expressions and four people of the least frequency statements in Table 5 were interviewed face to face. Interview analysis is given below.

B) Reasons for recall of learning areas

Under this theme, the reasons of the most remembered subjects in the science lesson are presented under the following categories.

a. Most remembered topics

In this category, three people were randomly selected from among the participants who statements the most remembered topics and face to face interviews were conducted to determine the reasons for this. The interview data is presented below:

"We had an experimental class at school. Our teacher would put on gloves and say what you want. He/she used to guide us all the time. He/she used to take us out into the garden. He/she used to tell the food chain, living things. He used to describe the interaction between living things. He would tell us about the destruction of the system with the destruction of a living thing. I can say that my knowledge about living things has always remained up to date. This was my primary school teacher, and thanks to him I liked the science lesson." (K2)

"My science teacher brought the skeletal system to the class, brought the human body model, and allowed us to study them. And he/she always told us about his/her organs. We were always in class but always giving examples of daily life." (K30)

"Our teacher used to say very well, he/she would do experiments in class. We've always been in the classroom, and we've taught outside. More about the rules of physics and nature would tell us. And he gave many examples." (K31).

As can be seen from the quotations, participates stated that they remembered the teachers through "*experiments*" in the classroom, focusing on the "*nature and physical rules*", giving many "*examples*", using the "*garden*", studying the "*living things*" on the spot, bringing the "*models*" to the class like the "*skeletal system*" and the "*human body*" and telling the "*organs*" on it. These quotations can be said that the teachers present the

acquisitions of the lesson with different activities by choosing the methods in which the students are active thus they still remember the students despite the years passed. Other than remembering issues, the reasons for not remembering were questioned. These quotations are presented below.

b. Inability to remember anything

In this category, three of the participants who did not remember anything were randomly selected for the face-to-face interview. The data obtained are presented below:

> *"My teacher was telling me well. I liked the lesson, but I couldn't think of anything at all." (K47).*
>
> *"I had a science teacher. He/She was teaching the lesson, but I'm forgetful, that's why I don't remember." (K18)*
>
> *"The teacher talked about everything except the lesson. He/She had a hygiene problem. He wouldn't even open the door by hand, she/he'd hit us with his feet, we would open up. I was a little indifferent, but I don't think she/he taught you well." (K29)*

As it is understood from the quotations, two of the participants stated that they "*did not remember*" because of "*personal reasons*" such as "*being satisfied*" with their teachers or "*being forgetful*", but not because of the "*hygiene problem*" in their teachers and doing "*extracurricular*" activities. According to these data, the reasons for not remembering the subjects are mostly caused by the student but may also originate from the teacher. The reason of this situation was questioned after the participants stated that what he / she remembered in the science lesson was curiosity. The interview data with the participant is presented below.

C. Curiosity

The data obtained from the participant are as follows:

> *"I have a lot of curiosity about it, but my teacher used to do sightseeing, use visuals, do experiments and let me discover something new. Thus, my sense of curiosity has improved and I am very curious about especially historical things." (K48)*

As stated by the participant, he stated that there was a sense of "*curiosity*" about him/her, but that the teacher used "*visuals*" in his class and that making "*trips and experiments*" enabled him to discover "*new things*", especially the historical subjects, and the feeling of curiosity. From these data, it can be said that scientific methods used in the classroom provide the development of emotions like curiosity in the individual.

4. Discussion

In this section, data are presented in a comparative manner during the questions of the research.

It is placed on the five basic learning subject areas of the science lesson prepared within the scope of the science curriculum. These subject areas are world and universe, living things and life, physical events, matter and nature, and finally science and engineering. Science lesson subject 108 hours in the 3rd and 4th grades and 144 hours in the 5th, 6th, 7th and 8th grades in total. The number of acquisitions varies by class level. When we look at the subject areas in the curricula over the total lesson hours, the first place is physical events with 36.99%. Afterwards, 25.51% of the subjects of living things and life, 18.69% of the matter and nature, 11.62% of the world and universe and the finally 7.20% science and engineering applications are the subject areas (MEB, 2018b). Similarly, Idin and Kaptan (2017) found that most of the doctoral theses in 2004 to 2017 were related to physical events learning area. As it is seen, it is understood from the researchers that they are aware of the problems of the physical events learning area and they are doing the studies accordingly.

The learning areas most remembered by the participants were living things and life with 68.18%, matter and nature with 20.78%, physical events with 9.74% and world and universe with 1.30%. Aydın and Çakıroğlu (2010) stated that science curriculum aims to make the learning permanent. However, as seen above, there is a very high recall rate in some subject areas, while in others it is low. According to the science lesson and curriculum, physical events with the highest acquisitions (36.75) are in the third rank according to the percentage of learning area recall level. Apart from these data, it was determined that the number of recoveries between the other learning areas was proportional to the recall values. According to this, living things and life, matter and nature, world and universe are the subjects (Deveci, Konuş and Aydız, 2018; Tüysüz and Aydın, 2009). In addition, although there is no number of acquisitions in the field of science and engineering learning, it was determined that there was no such learning area during the basic education of the participants.

The first three of the most remembered subjects in the science lesson were the systems, the characteristics of living things and the characteristics of nature. All three of these subjects are in the subject area of living thing and life learning. In addition to those who do not remember anything other than the data, it is determined that the participants in the sciences express that they have developed a sense of curiosity. As a result of the analysis of the data; It was determined that the participants remembered the systems we had because of their being curious about the body we live in, the characteristics living things and the nature they learned about the events and rules. Similarly, in the study of Gülen (2018c), it was determined that the individual was more actively involved in solving problems in the immediate environment.

As a result of the analysis of the interview data with the participants, it can be said that the teachers present the acquisitions of the lesson with different activities by choosing the methods in which the student is active apart from the traditional methods,

and therefore the students still remember after the years. Other than remembering issues, the reasons for not remembering were questioned. According to the obtained data, it can be said that the reasons for not remembering the subjects are mostly caused by the student but also by the teacher. Apart from these data, it can be said that scientific methods such as excursion, observation and experiment applied in the science lesson provide the development of emotions like curiosity in the individual. In contrast to this finding, Bekmezci and Ateş (2018) found in their study with teachers that the curriculum of science is not intended to increase the student's sense of curiosity.

In general, it can be said that different methods and activities used in science lesson keep information in memory for a long time. Similarly, Gülen, Taş, and Darga (2015) stated that different activities in the class affected the recall, Tarkın-Çelikkıran and Aydın-Günbatar (2017) determined that different activities in science lesson increased the retention rate of subjects. In the same way, Moore, Stohlmann, Wang, Tank and Roehrig (2013) and Bozkurt-Altan, Yamak and Invention-Kırıkkaya (2016) stated that the methods used in the lesson increased the level of information retention.

5. Conclusions and recommendations

The results obtained in this study and the suggestions given in parallel are presented below.

1. As a result of the study of science curriculum, it is determined that science lesson is prepared within the framework of five learning areas. Although the number of acquisitions varies from grade 3 to grade 8, there are 108 hours science lessons in grades 3, 4 and 144 hours in grades 5, 6, 7 and 8. When we look at the subject areas of learning in the curriculum through the total lesson hours, physical events, living things and life, matter and nature, world and universe, and finally science and engineering applications are the following. It has been determined that the number of acquisitions and lesson hours of these learning subject areas are directly proportional to one of the lessons. As the grade levels of the students increase, the number of lessons learned and the number of lessons are increased. Depending on the number of acquisitions of learning subject areas, it can be examined whether success levels have changed.

2. The subjects most remembered by the participants are living things and life, matter and nature, physical events, world and universe learning fields, respectively. There are no data related to science and engineering learning subject area. As a matter of fact, there was no learning area during the basic training of the participants. It is thought that this relationship between recall rates affects the areas where the individual interacts most. Depending on the high recall rate of the participants, it can be investigated whether the students have an effect on the subject. The reasons for not remembering learning areas with low recall rates can be investigated.

3. According to the science lesson and curriculum, the ranking of learning subject areas acquisitions and the frequency values of the recalled subjects obtained in the research are proportional to one. Only physical events that do not fit this ranking are the subject of learning. As a matter of fact, the level of recall of the physical events

learning area with the highest acquisitions is at the third rank according to the recall percentage values. This recall should be taken into account in the education of science subjects. The reasons of low recall rates of participants for physical events learning area can be investigated.

4. The first three of the most remembered subjects in the science lesson are the systems, the characteristics of living thing and the characteristics of nature. All three of these subjects are in the subject of living things and life learning. When the reason for the high rate of recall of these subjects is examined, the data of the fully structured interview form are analyzed; It was determined that the participants remembered the systems we had because of their being curious about the body we live in, the characteristics of living things and nature which they learned about the events and rules. In line with this result, it can be said that the level of recalling the subjects of the close environment of the individual is high. It is necessary to emphasize that the subjects that are as distant as the subjects close to the environment are also important in the science education.

5. As a result of the analysis of face-to-face interview data, it was determined that the methods and activities used by teachers in the classroom were effective in remembering the subject. According to this, it was determined that the methods in which the student was active and the different activities in the classroom affected the recall of the subject despite years. It can be said that in the science education, the students will interact and the methods that will be active provide a more permanent learning of the subject. In addition, it was determined that the reasons for not remembering the subjects were caused by both students and teachers. In the planning of science education, attention should be paid to both aspects.

In addition to these results, scientific methods such as excursion, observation and experiment applied in the science lesson provide the development of emotions such as curiosity. This result is important for future generations to use scientific methods and play an active role in scientific processes. In the science lesson, the proportion of such activities that will stimulate the most basic scientific motivation of the individual should be increased.

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