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Opinions of the 6th class matter and heat unit on the technique of the students working with the station technique

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Abstract

The aim is to reveal the views of the sixth grade Matter and Heat Unit on the technique of the students who work with the station technique. Qualitative method was used. The study group of the study was 25 students in the sixth grade who attended Ataturk Secondary School in the Cinar district, they were in the second year of the 2016–2017 academic year. They worked with the station technique. The application was applied in a total of 16 lessons including the Matter and Heat Unit. The researcher conducted the implementation process. Five stations including poetry, story, picture, song and slogan were created and worksheets and workbooks were used. Semi-structured interview form consisting of five questions was applied to 25 students to get opinions of the students about the station technique. Their answers were categorised and the percentages and frequencies were found. Research results determined that the students enjoyed the station technique and they wanted to use this technique in the other subjects of the Science course and in the other courses.

Keywords: Science, station technology, matter and heat unit.

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1. Introduction

The question of science is an extremely difficult question to answer. For there is no simple and definitive definition of science based on a common view by the authorities (Cepni, 2006). We can explain science as an attempt to examine and explain the assets and events in the vicinity, to find generalisations and principles related to them and to predict future events through these principles (Kaptan & Korkmaz, 1999). The aim of science is to develop theories by developing logical and systematic explanations for natural phenomena. By using scientific processes in learning environments, students are expected to understand how the scientific knowledge develops by doing research to understand the world and actively participating in the process (Milli Egitim Bakanligi (MEB), 2017). In the sciences, the natural beings and events are examined for the same purpose. Science can be defined as a systematic study of nature and natural phenomena, and efforts to minimise events that have not yet been observed (Kaptan & Korkmaz, 1999). It is not right to think of science as a sum only of facts related to the universe. Science is also a way of thinking and research based on experimental criteria, logical thinking and ongoing inquiry. Scientific methods include observing, hypothesising, testing, collecting information, interpreting data and presenting findings. In scientific studies, imagination, creativity, openness to new ideas, mental neutrality and questioning are very important. Therefore, it is very important in Science teaching to develop the enthusiasm for learning by changing the way of seeing and restructuring the events as they learn, learning to reach the correct information by direct exploration of the target individuals, and gradually learning. This feature was taken into consideration when the learning–teaching evaluation activities were determined (MEB, 2006). With science teaching, it is aimed that students develop research, questioning, critical thinking, problem-solving skills, being lifelong learners and maintaining a curiosity about the near and distant environment they live in (Aydogdu, 2006).

Science courses are generally found in school programmes for the following purposes;

1. Giving general information on science subjects (science literacy).
2. Gaining mind and hand skills through science lessons.
3. To provide a basis for vocational education related to science or technology.

The above general explanation reveals the importance of the science course in educating thoughtful, inquisitive, accessible and creative individuals (Kaptan & Korkmaz, 1999). Science courses provide students with problem-solving skills that enable them to come up with the challenges they face in everyday life. It is expected that the individuals who find creative solutions to the problems they face will be able to look more positively and delight in happiness. Education and training for science should be a form of self-reliance, motivation and curiosity that will make it easier for students to love science and relate it to everyday life. In science, the process should be towards students being researchers, questionable individuals (MEB, 2006). Science is the life itself, not only the writings, formulas, rules and how to do it, which are written on the pages of the book, but also the experimental guidelines that are told for a long time. Science is the phenomenon that has been experienced, experienced and will have been experienced in the world. Rapidly advancing science and technology, adults' knowledge and experience gained in a short period of time causes insufficient. Science is a social experience. Science plays an important role in raising new generations as individuals with the spirit of research and in accelerating development by meeting the need for trained technical staff who have an important place in the development of a country. It should not be forgotten; Scientific knowledge may arise and change as new ideas are introduced and tested. There is a need for trained staff to keep up with the day-to-day pace of information and technology. There are many changes and developments in the world. The head of these changes and developments, no doubt; with the emergence of information societies. Technology is the application of information obtained by testing the correctness (Hancer, Sensoy & Yildirim, 2003). Individuals are informed of the information they learn and technological developments through the science and technology course, and they have the opportunity to use technology with this knowledge they get. This situation is especially important

for the students to contribute to the technology in the future. With an effective science and technology teaching, students are taught to think like a scientist and acquire high-level mental skills. The main purpose of our education system should be to acquire the skills of accessing information rather than conveying the current knowledge to our students. This is achieved by senior mental process skills. In other words, learning by grasping by reciting requires the ability to come up from the problems of new situations encountered and scientific method process skills. Science lessons are one of the lessons in which these types of qualifications are gained. Science is a systematic study of nature and natural phenomena, and effort to cut down on events that have not yet been observed. Individuals can make predictions about some incidents and phenomena that have not yet happened thanks to science information. Individuals who learn about science-related events can perceive a number of events that can be realised by perceiving events happening in their surroundings and can make life easier. In contrast to learning through memorisation, thanks to science course students learn to ask questions, identify problems, make observations, build hypotheses, collect data and analyse data, and learn how to achieve generalisations. In today's technological society, individuals have to be knowledgeable about many scientific problems (Kaptan & Korkmaz, 1999). Today, one of the aims of science education is to answer the questions that children and young people always ask about nature in an effective way. The second is to ensure that children adhere to a constantly changing and developing environment. Therefore, science and technology are very important for the development of both ourselves and our society (Kaptan & Korkmaz, 1999; Temizyurek, 2003). Countries are constantly updating their education policies to begin with the primary education levels, especially in science education, with the awareness that technology can be bought but science cannot be bought. In Europe and America, many researches are being done to improve students' positive attitudes towards science and to increase science achievement. It is seen that the knowledge and skills gained in the first years of school life constitute the basis of other teaching periods, especially focusing on improvement of curriculum programmes, provision of necessary facilities for the implementation of these improved programmes and proper methods development (Bozdogan & Altuncekic, 2007). The choice of the method-technique to be used in teaching the science course is very important. We can define the teaching method as the way to reach the goal in teaching activities (Altun, 1998). On the other hand, the teaching method is to apply existing tools and methods (Temizyurek, 2003). In other words, it is the whole process of applying a teaching method or in the learning environment (Demirel, 2012). The method is to design the teaching–learning process (Temizyurek, 2003). The method is a way in which the teacher and the student walk together with the target and target behaviours (Tosuntas, 2013). There can be multiple ways to deliver the student to the target and target behaviours. The age, gender, abilities and interests of the students, the socio-economic and cultural characteristics of their families, the environment they grew up in, etc. it may have an effect on the choice of these pathways to the target. A self-taught teacher should be able to offer different ways when necessary, according to the characteristics of the students in the class. A course made without taking into consideration the characteristics of the students is like a course taught to the air or a stone taken in the dark (Varol, 2007). In addition, teachers should have good skills in terms of time and classroom management. One of the techniques used in science is the station technique. The station technique is a type of course processing in which students perform a number of learning activities using specific guidelines established by the teacher or teacher-student in the special areas created by the students (Benek & Kocakaya, 2012). Learning stations are one of the modern methods frequently used in recent years. In this method, students who can work independently from each other have the opportunity to use plenty of tools and materials, and they are actively involved in the learning process by getting rid of the course listening monotony. It enables the information learned through visualisation to be permanent (Demirors, 2007). Erdagi (2014) defines training as a way of moving a work done from the place where it was built, into a project technique that brings a new breath into the programme with a constructivist approach. A station technique is a technique that offers active learning and rich experiences, either inside or outside the classroom, individually or as a group, for the first time to learn or repeat a theme, to direct students to explore. In this technique, the responsibility of learning is on the learners and learn how students learn (Benek & Kocakaya,

2012). Different techniques have been put into practice in science education in recent years (Demir, Sincar & Celik, 2015). One of these techniques is the station technique. It is not a mistake to say that the station technique individualises teaching when it is thought that each student's ability and interest is different. With this knowledge of the station technique, every student learns how to learn better. The station technique offers students the opportunity to explore their talents. Because the training environment in the station technique is arranged according to the student, it is very important for the students to participate actively in learning. In recent years researches on science teaching and station technique have gained speed in the world and our country. This research is thought to contribute to further research.

2. Purpose of the research

The purpose of this research is to reveal the opinions of the students who work with the sixth Grade Science Course Material and Heat Unit by the station technique on the station technique.

For this purpose, the following questions were sought.

1. What are the opinions of the pupils about the station technique?
2. What are the opinions of the students whether they want the other subjects of the science course to be processed by the station technique?
3. What are the opinions of the pupils about the other courses being processed by the station technique?
4. What are the opinions of the learners about the activity-gain they most liked in the station learning technique?
5. What are the opinions of the students about the activity-acquisition that is least liked in the station learning technique?

3. Method

The research was conducted in accordance with the qualitative research traditions. Qualitative researches provide depth and a philosophical dimension to scientific research (Altiparmak & Nakipoglu, 2005). The qualities possessed in qualitative variables can only be explained by separating them into certain categories (Bahar, Nartgun, Durmus & Bicak, 2012). In this study, special case studies were used from qualitative research methods. The special case method is an assistive method for the researcher to obtain the information by examining in depth the environment where the event occurred (Cepni, 2007; Yin, 2002).

4. Study group

The study group of this study is composed of 25 students in the sixth grade who are studying at Ataturk Secondary School in Cinar district of Diyarbakır in 2016–2017 academic year.

5. Data collection tool

Interview Form was used as data collection tool. Five open-ended questions were applied to examine the opinions of students participating in the research on the station technique. Prior to the application of the questions, the opinions of an educational science specialist and a science education specialist were taken. The adaptation was applied in a total of 16 lesson hours covering the matter and heat unit. Twenty-five students, who constituted the study group of the study, trained with the station technique. A total of five stations, poetry, story, picture, song and slogan, respectively, were created in order to distribute the students heterogeneously while creating stations.

6. Data collection process and analysis of data

Care was taken by the investigator to change the location of the students after 8 minutes at the stations. At the end of the exercise, the Interview Form was implemented to obtain the views of the working group on the station technique. Analysis of the answers given to the first three questions of the interview form; positive, negative and partly positive. These categories have frequency and percentages within the group. In the last two questions, the students were asked about the activities they liked best and least liked about the station technique and the answers given by the students were tabulated and the frequencies and percentages within the whole group were determined. In addition, the opinions of some students are quoted. In order to ensure the reliability of the Interview Form, the opinions of two independent experts were compared to test the suitability of the categories. For the reliability of data analysis, Miles and Huberman (1994); Reliability = Opinion Alliance: (Opinion Alliance + Visibility Separation) × 100 formula was used and the reliability value was found to be 90%. Since this value was greater than 70%, it was considered reliable for this study (Miles & Huberman, 1994).

7. Findings

The findings from the interview form analysis are presented below in the form of titles.

Table 1. Students' opinions about the stations learning technique

Student opinion	*f*	%
Positive	24	96
Partially positive	1	4

According to Table 1; 96% of the students used positive expressions for the technique. None of the students reported negative opinions about the station technique. The number of students who found the station technique to be partially positive; 1, only 4% of the participants. The majority of students who responded positively to this question expressed that they enjoyed the activities and learned the subjects more easily.

One of the participants, who stated that your technique was partly positive, expressed his opinion as follows;

'I like the Station Technique very much, but my group of friends would not have liked it' Participant 1

Some of the participants, who stated that your technique was positive, expressed their views as follows;

'I like it very much and I learned it' Participant 2

'Thanks to the station technique we have increased our knowledge' Participant 3

'I loved this technique. A very nice thing I was unaware of the Matter and Heat Unit' Participant 4

'Thanks to this technique we learned a lot from ourselves' Participant 5

'Thanks to the change of the stations with my friends, I had a lot of fun and learned a lot. I think it was great' Participant 6

'The station technique was very nice because we exchanged information with our friends' Participant 7

Table 2. Opinions of the students about whether they want the other subjects of the science course to be processed by the station technique

Student opinion	*f*	%
Positive	22	88
Negative	1	4
Partially positive	2	8

When the students' opinions on whether they want the other topics of the science course mentioned in Table 2 to be processed with the station learning technique, a large part of the class (88%) responded positively. Students who respond positively expressed their thoughts about the success of this technique and therefore the success of other issues. Part of the participants (4%) stated that they did not want other subjects to be treated with this technique, while the remaining students (8%) were undecided about whether they could be positive.

Some of the participants, who stated that your technique was positive, expressed their views as follows;

'I would like it in the Light and Sound unit as well because it increased my success'. Participant 8

'Yes, because I would like to have fun with the lessons'. Participant 6

'I wanted to because I think it will come to many good topics'. Participant 10

'Yes, because I have not fully understood what I've been working on. They used to work with this technique, so maybe I understood them'. Participant 3

'I would like to say, because thanks to this technique our ideas are developing'. Participant 7

One of the participants, who stated that the technique was negative, expressed his opinion as follows;

'No, I would not want to because the subjects were confused'. Participant 4

The two participants, who stated that the technique was partially positive, expressed their views as follows;

'Yes, but my group of friends wish I had changed'. Participant 5

'If my group will change, maybe I would like it to be'. Participant 1

Table 3. Opinions of the students about the processing of the other lessons with the station technique

Student opinion	*f*	%
Positive	20	80
Negative	2	8
Partially positive	3	12

According to Table 3; 80% of the students stated that they wanted to increase their success in science lessons thanks to the technique of station and that they would also want them to work with this technique in order to increase their success in other lessons. Some of the students (8%) answered negatively, thinking that the station technique did not match the structure of the other courses. The rest (12%) indicated that they were unstable in this regard.

Some of the participants, who stated that your technique was positive, expressed their views as follows;

'Yes, I would like to improve our imagination'. Participant 6

'Yes, I would like because some of our friends who did not attend classes attended the lesson with this technique'. Participant 10

'This technique allows us to learn other lessons because I would like it'. Participant 2

'Yes, I would like to develop our imagination'. Participant 15

'Yes, I would like to have fun and learn'. Participant 17

Two participants, who stated that the technique was negative, expressed their views as follows;

'' No, I would not want to because it is difficult ''. Participant 7

'' No, I would not want to, because we have to do it at every dersten station. '' Participant 11

Some of the participants, who stated that your technique was partially positive, expressed their views as follows;

'Yes, I would, except for English course'. Participant 8

'I did not want some in some of you. For example, mathematics is very difficult and we could not learn ourselves'. Participant 19

'I would like to study science lessons but I think it would be difficult in others'. Participant 24

Table 4. Opinions of the students about the most favourable activity-winning in the stations learning technique

Student opinion	*f*	%
Story	8	32
Slogan	6	24
Poetry	4	16
Song	3	12
Idea production	3	12
Opinion shopping	4	16
Group work	5	20
Picture	3	12

When the data on the most favourite activities and achievements of the students in the station technique are examined in Table 10, slogan (24%), group work (20%) and activities, in general, as a story station (32%) in the first place.

Besides, some students expressed that they enjoyed the idea generation (12%), the idea exchange (16%) from the poetry station (16%), the song station (12%) and the picture station (12%).

One of the students, who stated that their favourite activity-story is the story of the achievement, expressed this thought.

'Story station. Because we wrote a story at the story station and wrote the information we learned in the story'. Participant 9

One of the students who stated that the most favourite activity is the slogan of the achievement,

'I like the slogan station very much. Because it was very fun'. Participant 10

One of the students who stated that their favourite activity-gain was in-group idea shopping, expressed this thought;

'I liked going shopping at the station'. Participant 11

Table 5. Opinions regarding the efficiency-winning of the students with the minimal likes in the stations learning technique

Student opinion	***f***	**%**
Song	1	5
Picture	2	10
Exclusion to	3	14
Noise	4	19
Slogan	1	5
Passive group	6	29
Do not know the technique	1	5
Poetry	2	10
Story	1	5
Intervention of others	2	10

When the results of the responses given by the students in Table 5 that the students did not like or least liked in the station technique were examined; Since four of the students did not report any negative opinions, the answers of 21 students were included in the calculation. 28.5% of the students stated that their group friends were very passive, 19.04% of the students stated that there was a lot of noise in the class, 14.2% were excluded by the group and their opinions were not taken seriously and 9.5% said that they did not like the painting station because they think there is no painting ability. Besides, some students said that they do not like songs (4.7%), poetry (9.5%) and slogan (4.7%) stations. One student (4.7%) reported negative feedback, saying he did not know the technique well and did not understand what to do during the study. Students who were disturbed by the intervention of other students (9.5%) also reported their thoughts on this. One of the students who said that the least-favoured activity-gain was the passivity of the group;

'I do not like some friends in our group never to join us'. Participant 12

One of the students who said that the least favuorite activity—the noise of the acquisition—is that this idea is stated as follows;

'Disruption and turmoil while arranging the legends (Too much noise)'. Participant 23

One of the students who said that his least favourite activity-acquisition is exclusion/intervention,

'Someone writing and writing a word to make fun of him'. Participant 14

One of the students who voiced that there was nothing they did not like, explained this reason with the following sentence;

'Obviously there is nothing I do not like on this station'. Participant 21

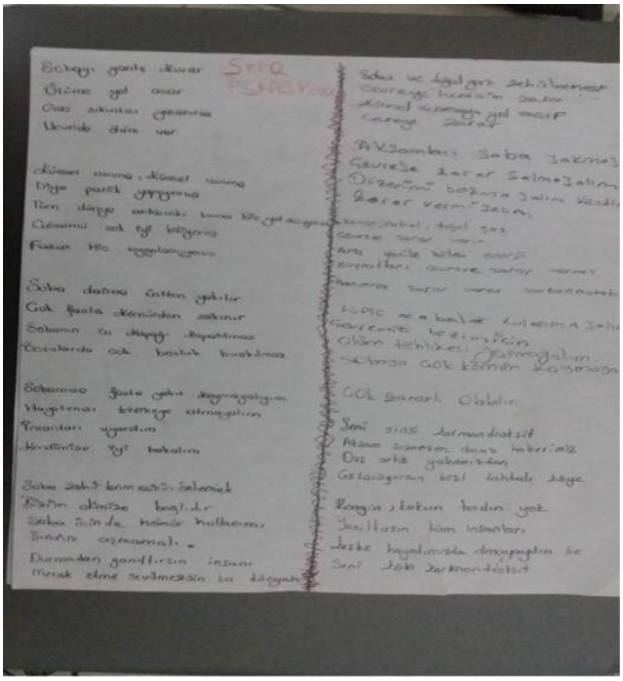

Figure 1. Poetry station study

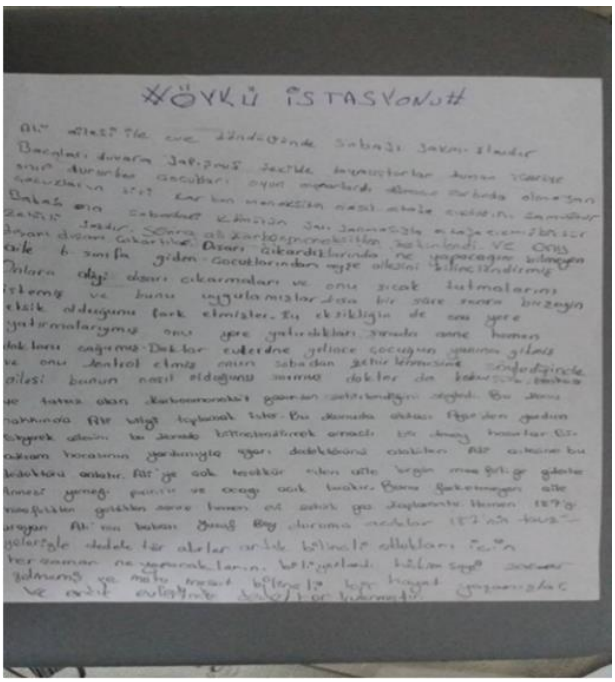

Figure 2. Story station study

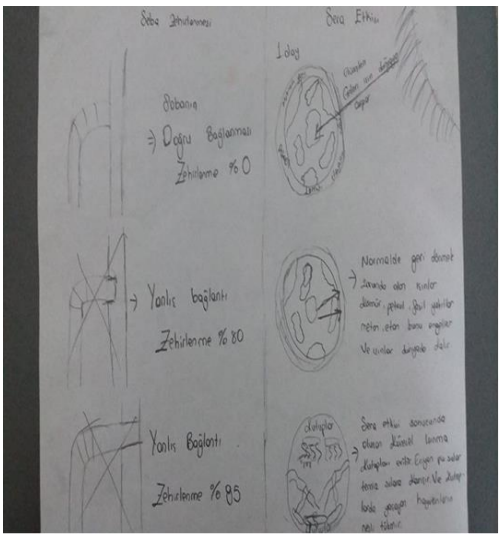

Figure 3. Picture station work

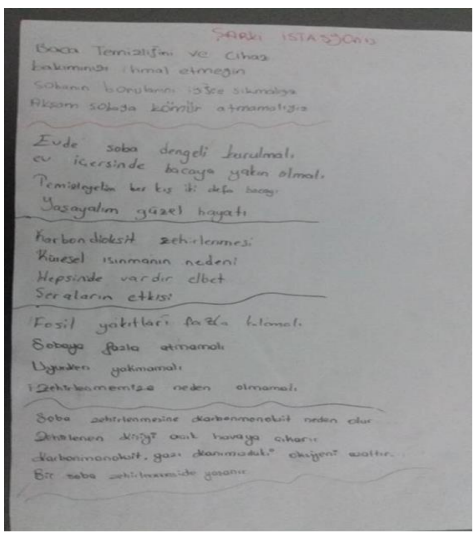

Figure 4. Song station work

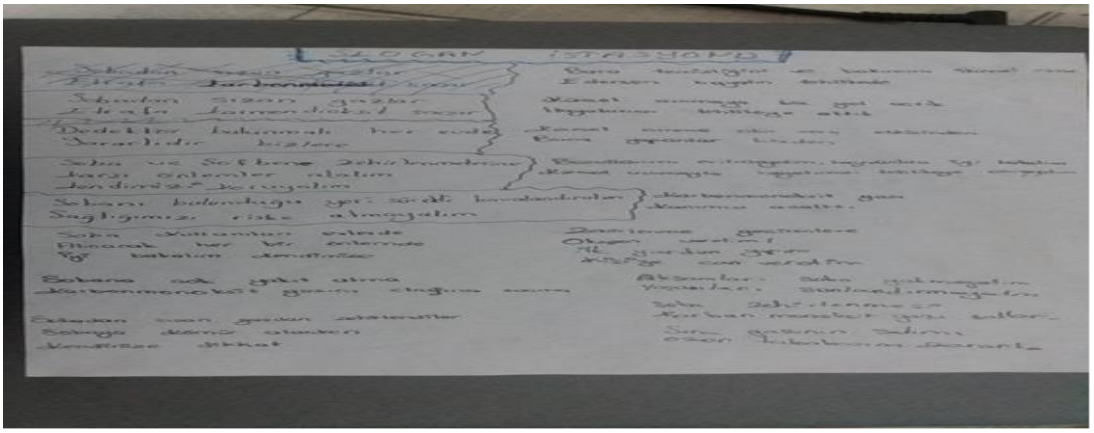

Figure 5. Slogan station study

Figure 6. Activity photos

8. Discussion and conclusions

Based on the results of the research, we can say that students have developed a positive view of station technology. Some of the students participating in the station study are positive about the students' point of view on the station technique, since they have been interested in the science course since the course was taught by the station technique, and when they are applied in other courses, they are curious about how they will change their achievements in the lessons and the lessons. We can say that the student favourite station is the story station, and the least favourite station is the picture station. Based on the Interview Form; we can say that the station technique in general allows the students to work group by group, that the group members produce ideas and that these ideas are shared so that the successes are increased. The fact that the station technique is not fully known by the students, the noise that occurs during the study and the exclusion or passive of some students from the group are the factors that prevent the students from achieving their achievements and gain a negative point of view towards the station technique. It has been found that some of the previous researches on the station technique have similar or different results in our research. The study conducted by Albayrak (2016) aiming to determine the attitudes of the students towards the station technique has led to the fact that the students developed a positive attitude towards the station technique but it was not at a meaningful level. Avci (2015) found that the station technique did not have a holding effect in his English teaching. An important conclusion is that most of the students in this survey have positive feedback on the processing of the other subjects of the science courses with the station technique. The question that we asked about the other courses to be processed with the station technique was also written by some of the students. It was also seen that the English course was one of these courses. Here, teacher influence, etc. The effect of factors can also be considered. In their research on Korsancilar and Caliskan (2015), they believe that it is necessary to present vocational development programmes to technical teachers in order to ensure that the station technique is widely used by teachers. Because of the technical interview form, some of the students stated that they wondered if the technique in the other lessons worked. This research

overlaps with the findings of our study. In his research Gunes (2009), students reported positive views on the use of station technology in other subjects and other lessons in Science. This result confirms our Interview Form results. In this study, 88% of the students in other subjects of Science courses, 80% of them; and the other courses were also positive for the processing with the station technique. Demirors (2007) has found that students have developed positive attitudes towards learning in stations, according to the research he has done. This research confirms our research. Based on our interview form results, the students' tendency to think positively towards the station technique is parallel to the results of this research. Ninety-six per cent of the students in our study reported a favourable opinion on the station technique. When we look at the results of the study by Benek and Kocakaya (2012), Student Opinions on Learning Techniques at Stations; they saw the station technique as a useful technique, they enjoyed participating in activities at the station centres, the station saw the learning technique as a method that should be applied in other subjects of Science and Technology course and in other courses outside Science and Technology course.

Based on the findings from the Interview Form, we can say that this research yields similar results with our research. Because, in the interview form, the students expressed satisfaction with the station technique that the successes increased and after that, they wanted to be successful in all the subjects, the other subjects of the science course and the other courses to be processed with this technique. Farkas (2002) used station technique and established five different stations in his research that appeals to more than one sensation of learners and takes learning styles into consideration and investigates the effect of students on attitude skills. A multi-perceptual approach to the station has resulted in the development of a positive attitude. The result of this research by Farkas overlaps with the results of our interview form.

9. Recommendations based on research results

- When practiced in crowded classrooms, the teacher should be prepared and prepared in advance.
- Students may be allowed to change their working hours at stations.
- With this technique, students can discover different abilities they have never worked before.
- Teachers should pay serious attention to the station technique in university education they had seen before starting their career.
- MEB should prepare the infrastructure necessary for efficient implementation of the station technique. For example, a class can be created where various materials and technological equipment are available to schools.

10. Future research recommendations

- The effect of using the station technique with different teaching methods and techniques can be examined.

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