

The Views of Science and Art Center (SAC) Students Regarding Socratic Inquiry Seminars*

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Abstract. The purpose of this study is to determine the views of students attending Science and Art Centers (SAC) about Socratic research seminars. This qualitative study was conducted with nine undergraduate students. Individual interviews were conducted with students after the seminars, which spanned 10 weeks, about their opinions of the seminars. As a result of the content analysis, it was found that students rated the Socratic research process as a process in which they can freely express their thoughts, have a scientific experience that contributes to their development, individual differences come out, a good method is used for the development of the discussion, questions and discussions about science are held. In addition, students believe that at the end of the seminars, they can ask better questions both quantitatively and qualitatively, change their ideas, question themselves, develop their sense of curiosity, emphatically respond to different opinions and make philosophical inquiries.

Keywords: Science and Art Center (SAC) students, socratic inquiry seminar, viewpoints of students

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Introduction

Socratic inquiry, the basis of inquiry, is a powerful and popular technique that guides students to produce qualified thoughts by providing deep and meaningful questions (Paul & Elder, 2007). By developing a learner-centered education approach, Socrates has chosen to discover knowledge through active participation such as discussing and questioning, forming ideas, defending ideas, and sharing ideas. What Socrates wants to do with education is not to memorize or collect information but to give people the ability to think, discuss, and analyze. Through his unique method, he aimed to give people the opportunity to structure, form, interpret, and develop information (Kantarci, 2013). Claiming that the question-answer technique and Socrates method are confused, and the distinction is not clearly revealed, Aydin (2001) defines the method applied by Socrates in philosophical discussions as a method of finding the adapted form of teaching states that it is different from the question-answer technique. According to this, the method of finding that Socrates used in philosophy and is used for many different purposes in teaching, consists of using the combination of techniques such as question-answer, advice, problem-solving, brainstorming, and case study (Aydin, 2001). Thus, Socratic inquiry contributes to the student's ability to analyze a subject or a problem in-depth, have an opinion on the subject, and be able to make comments freely and approach other thoughts and suggestions critically (Bozer & Kurnaz, 2016).

Wiggins (2004) emphasizes that Socratic inquiry seminars are a different class type or teaching strategy and states that these seminars will be understood better when considering what seminars are not. According to this, Socratic inquiry seminars are not an education, not an interactive lesson, or not student talks recorded in the 19th century as "recitation." Socratic seminar is neither a debate nor a teacher-directed activity; instead, it is an in-class discussion where students take turns sharing their thoughts, feelings, and reactions. Socratic seminar is rather a collective inquiry into questions and issues that are often raised and animated through a reading activity or experience sharing. One of the main goals is to improve everyone's understanding of events, which should not be confused with answering the teacher's questions. Socratic inquiry seminars also aim to improve each person's understanding on their own through speaking, testing ideas, and in-depth thinking. The aim is not to give information about a subject, complete the subject, and close the subject, but remove the cover, decode, and bring it to the surface (Wiggins, 2004).

In Socratic inquiry seminars where a real discussion environment is created, 'content' and 'process' are performed together. The student not only learns more about an idea or text but also learns how to discuss it (Wiggins, 2004). In order for students to be fully involved in Socratic dialogues as active inquirers, they need to be comfortable with the process (Wenning et al., 2006). At this point, it is stated that the seminar, designed to enable students to discover a text, a problem, an experience, is not a form of speech that takes place with teacher-led instructions (Wiggins, 2004) and the role of the teacher should not be teaching only (Schjelderup, 2009). The teacher's primary role is to awaken students' interest in scientific and philosophical issues, guide them to academic thinking,

and help them examine themselves independently (Schjelderup, 2009). Therefore, in the classroom where the seminar is held, students have the opportunity to ask questions, reflect on them, and discover others' answers. From this point of view, it is stated that the development of students' habits and skills is expected from the teacher in the traditional education environment; but in this new environment, these have become students' opportunity and responsibility (Wiggins, 2004).

Increasing the effective use of Socratic inquiry in classrooms and making individuals acquire this skill to reflect it on their daily lives is an important issue for raising mature individuals as an idea. Although Socratic inquiry skill is a necessary and effective method for the student's intellectual development, there are insufficiencies in the application and acquisition of this skill in our country. The importance of Socratic inquiry is mentioned, but there is not enough research on this subject, and studies are insufficient to solve its problems (Bozer, 2014).

Examining national and international studies on Socratic questioning as a method in general, one finds that there are studies on its use in teaching a subject or a concept (Bijoch, 2015; Coban, 2016; Dadi, 2013; Korkmazer, 2016; Oktay, 2012; Yakar, 2017; Zeybek, 2019) and that it can be used in the development of cognitive domains (Ertugrul & Inan, 2009). In addition, the place it occupies in programs and practice (Cebi, 2006) and the questions asked by teachers in the Socratic inquiry have been studied (Al-Darwish, 2012; Bulbul-Huner & Kucuktepe, 2018; Kucuktepe, 2015). Moreover, it is discussed in terms of its effect on skills such as critical thinking (Emir et al., 2012; Hong & Jacop, 2012; Kusmaryani, 2017; Shahsavari et al., 2013; Yang et al., 2005), reading comprehension (Epcacan, 2013), and speaking (Kusmaryani, 2017). In addition, it is seen that the effect of Socratic inquiry is examined in relation to academic success and permanence (Emir et al., 2012; Bulbul-Huner, 2018), metacognitive awareness (Emir et al., 2012); second language learning (Knezic et al., 2013), and students' answers to questions and diary writing (Sahamid, 2016).

In reviewing the studies examined, it appears that while Socratic questioning has positive effects on many aspects, such as critical thinking, metacognitive awareness, reading and speaking skills, academic achievement, persistence, teaching of subjects or concepts, and language development, there is no study that directly addresses students' experiences with and views of the Socratic questioning seminar. At this point, the research question of this study is determined as "What are the opinions of SAC students on Socratic inquiry seminars?".

Method

Basic qualitative research, one of the qualitative research designs, was used in this study. Researchers who conduct basic qualitative research are concerned with how people interpret their lives, construct their world, and what meanings they add to their experiences (Merriam, 2018). Therefore, the primary purpose in basic qualitative research is to reveal and interpret how meaning is constructed. In this research, a 10-

week process consisting of two activities, three videos, and five reading texts selected according to the learning areas (science, scientist, scientific method, and scientific knowledge) included in the Science and Art Center's science curriculum (SAC) was conducted for participants to experience the Socratic inquiry seminar. After the seminars, the opinions of the participants about their experiences in the seminar process were determined. Thus, as a requirement of basic qualitative research, it was aimed to reveal and explicate the interpretations of the Socratic Inquiry Seminars that emerged from the participants' experiences.

Study Group

The study group of this study consisted of 5th grade students who were registered in the Individual Talents Recognition (ITR) program in a SAC affiliated to the Ministry of National Education in Denizli, Turkey, in the Fall Semester of the 2018-2019 Academic Year and who were recognized as gifted. The research was conducted with nine students, four girls and five boys, who voluntarily participated in the *Socratic Inquiry Workshop* opened by the researcher at SAC. The reason why the study group was chosen from the SAC students in the study is that Socratic inquiry, which is applied within the scope of the research, is presented as a learning process different from the implementation of education and training programs in formal education for gifted students to understand their potential and contribute to themselves and the society (MoNE, 2016).

Characteristics of the Researcher

Before starting the research, the researcher participated in the first module of the seminar "Trainer Training in Philosophy with Children" from October 20 to 22, 2017 at "basic level"; then, she received 40 hours of "Trainer Training in Philosophy with Children" at "advanced level" in the second module, which took place from March 10 to 11, 2018 as a continuation of the first module. The seminars, organized by the Child Development Academy, were delivered by Dr. Anton Vandeursen and Dr. Nanda van Bodegraven. The researcher conducting this research has directly experienced philosophizing with children and Socratic inquiry seminars as a participant in seminars that were held both theoretically and practically.

Procedure

The study was conducted in the workshop opened in a SAC in Denizli, Turkey, as stated in the study group statement, and was led by the researcher of the current study. Therefore, seminars were held in classrooms in this SAC. Before starting the seminars, an acquaintance and information meeting was held with the study group and their parents on October 20, 2018. At this meeting, students and their parents were shown Socrates' 3-filter test and videos of Plato's Allegory of the Cave. The purpose of the Socratic Exploration Seminar was explained by having a brief discussion about the videos. Then the parent permission form was distributed to the parents who had attended

the meeting and it was sent through the students to the parents who had not attended the meeting. The time of the workshop has been chosen according to the participants' course schedule and has been set for 3.30 pm-5 pm on Saturdays between October 27, 2018 and December 29, 2018. Within the scope of this study, a 10-week process consisting of two activities, three videos, and five reading texts, lasting 740 minutes in total, was conducted for the participants to experience the Socratic inquiry seminar. In the selection of the activities, videos, and reading texts, the learning areas included in the science curriculum used in SAC were taken into consideration, and the Nature of Science module created for the Individual Talents Recognition (ITR) groups was taken into consideration to develop a general perspective about science in students. Opinions of field experts were taken on the content of the activities to be implemented in the seminars, and pilot applications were made in different groups. Accordingly, seminars were conducted by applying: *4 Tables Activity* and *Mysterious Bones* (developed by Lederman and Lederman, 2005) as activities; *Flying, Stone Age and Technology* and *Science Project Monster* as videos; and some parts taken from Aronson's (2005) book named as *Scientific Goofs: Adventures Along the Crooked Trail to Truth* (i.e., *There is a goof in the Halva, Like Gold, Learning Fire, Dancing Legs, and Run for the Blunders, Reach Success*) as reading texts.

For the steps followed in implementing the seminars, the *Seminar Implementation Plan and Teacher's Guide* proposed by McCall (2009) were used, and the sessions were conducted in this direction. Accordingly, the workshop rules were written on the board, *Speech Bars* were used, and the participants were asked to explain whether they joined each other during the workshop (along with the reasons), and to state their opinions about each other's ideas. Group activities and individual texts were given to the participants as worksheets. In the seminars, after reading the texts or watching the films, participants were asked to think about a topic related to the theme of the texts or films. After all the topics were written on the board, they were asked to formulate a question to discuss about the text or film. After they had about five minutes to think, all the questions were written on the board one by one and the questions they wanted to discuss were selected by voting. By creating a discussion environment on the selected question, the participants were encouraged to question their own and each other's opinions. When the inquiry decreased, they were asked to produce a new question each and the inquiry process was continued with a question selected by voting again. After each seminar, their opinions and suggestions regarding the application were received in writing or orally.

Measures

The main feature of qualitative research is to reveal the perspectives of research subjects and their semantic worlds and see the world through their eyes. Therefore, the defining feature of the interview technique used in qualitative research is to reveal the interviewees' perspectives. For this reason, it is essential to understand the semantic worlds, feelings, and thoughts of the interviewees and to obtain deeper information, unlike quantitative data (Kus, 2009). In this study, "interview form approach" was used

to examine the participants' opinions about Socratic inquiry seminars in depth. In this approach, the interviewer has the freedom to ask both pre-prepared questions and ask additional questions to get detailed information about these questions by adhering to the topics and fields they have prepared previously. Additionally, the interviewer may not ask the questions that have already been answered by the interviewee, skip some questions, or give up asking (Yildirim & Simsek, 2018).

In this study, the participant interview form (prepared by the researcher of the current study) was used as the data collection tool. While preparing the form, the following issues were taken into consideration: making the questions easy to understand, including focal questions, including open-ended questions to avoid guidance, not having more than one question in a question, including alternative and probe questions, and logically organizing the questions. Using the draft interview form prepared before the data collection, a pilot application was made with three students. The opinions about the questions were taken from a science teacher working at SAC and three faculty members who are experts in science education. In the participant interview form, which was finalized after the necessary corrections followed by pilot applications, there are eight questions to determine the students' opinions about the Socratic inquiry seminar, which was held throughout 10 weeks. The content of the questions is generally aimed at determining how the participants feel themselves in the seminars, how these seminars reflect on themselves and their daily lives individually, what they think about Socratic inquiry and questions, and what their positive and negative opinions are about the seminar process. A 15-page data document was obtained from the interviews with the participants (which lasted about 132 minutes in total) after the seminars.

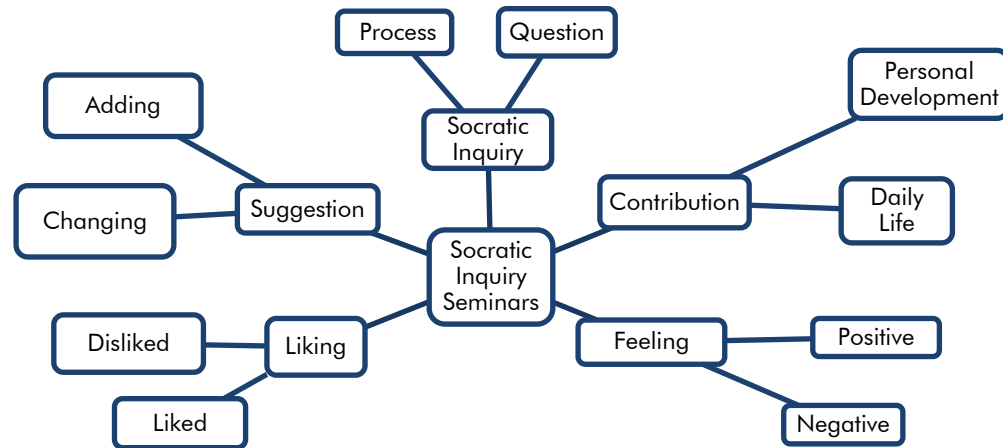
Data Analyses

The data of the research were obtained from the interviews with the participants. Voice recordings of these interviews were obtained, written in a computer environment, and the participants were coded in the form of "P1, P2, P3, P4, P5, P6, P7, P8, P9" to get rid of ethical problems. The data obtained from the interviews with the participants were analyzed according to content analysis. Creswell (2012) interpreted content analysis as bringing together similar data within the framework of certain concepts and themes and organizing them in a form that the reader can understand. Accordingly, the themes and sub-themes reached as a result of the analysis of the opinions of SAC students on the Socratic inquiry seminar are presented in Figure 1 below.

When Figure 1 is examined, the participants' views about the Socratic inquiry seminar are discussed under five themes. Accordingly, the theme of Socratic inquiry was examined in the context of the subthemes of process and question; the theme of contribution was examined in the context of the subthemes of personal development and daily living; the theme of feeling was examined in the context of the subthemes of positive and negative; the theme of liking was examined in the context of the subthemes of liking and disliking; and finally, the theme of stimulation was examined in the context of the subthemes of adding and changing.

Figure 1.

Themes and Sub-Themes regarding Socratic Inquiry Seminar.



Results

The research question was “What are the views of SAC students on Socratic inquiry seminars?” The findings regarding this research question resulting from the content analysis were presented under the main themes determined.

Findings regarding Socratic Inquiry Theme

As a result of the data analysis obtained from the interviews with the participants, the *Socratic inquiry* theme is divided into two sub-themes: *process* and *question*. The codes determined for these sub-themes are given in Table 3.1 below.

Table 1.

Sub-theme and Code Table regarding Socratic Inquiry Theme

Theme	Sub-theme	Code	Participant
Socratic Inquiry	Process	Expressing thoughts freely	P9
		A good way to develop a discussion	P9
		Finding a topic, finding a title, creating a question, discussing science	P8, P5
		Important knowledge	P7
		Scientific experience	P7
	Question	The emergence of different views	P9, P7
		Increase in the number of questions	P2
		Increase in the quality of questions	P2, P7, P5, P4
		Variance in viewpoints	P7
		Question suitable for Socratic thought	P9
Respect for the different viewpoints	P4, P5		
Question not suitable for Socratic thought	P9		

According to Table 1, participants described Socratic questioning as a process of freely expressing their thoughts, acquiring important knowledge, gaining scientific experiences that contribute to their development, uncovering individual differences, using a good method for developing discussion, finding topics and titles, creating questions, and discussing science. Below are examples of direct quotes from participants' views on the Socratic research process.

For the topic of discussion and development, I mean the discussion doesn't necessarily have to be bad. So, it was a good improving method for discussing different topics. (P9)

At first, I clearly say it is an experience, a scientific experience. After that, I say that it improved us. I recommend everyone to participate because it really improves. (P7)

Socratic inquiry is something you find one subject, and you create titles, subjects, questions about it. You discuss about it within the framework of science. (P8)

If anything should be talked about Socratic inquiry... I would say that "Are you sure this information is correct?". (P5)

In examining the above quotations, it is apparent that the participants view the Socratic question seminars as a scholarly experience and a method that improves themselves. They rethink the concept of discussion and deal with it positively, associating it with science regardless of its negative meaning used in daily life, and see it as a process in which they tend to question the accuracy of the information they acquire. Sample citations of the participants' views regarding the sub-theme of the Socratic Inquiry Seminar within the scope of its main theme are presented below.

The reason why you said "create questions" at first is that we are applying Socratic thinking. As if questions arise so that different thoughts can also arise. (P9)

I think there is. Because I was thinking differently there, I think differently here. That's the first reason. And sometimes people think that some looks can be wrong. But s/he doesn't think of looking at something with that look. He goes to another look. (P7)

At first, I could not choose the question. But towards the end, I could find more such questions than the initial ones. I could not find it before. It was ridiculous, but it was good at the end. I mean, I developed as I did it. It was more negotiable rather than having a result. (P2)

Because the questions make more sense when learning more scientific knowledge... Both the questions and the answers make sense. Questions without an answer make people think more. (P5)

For example, I asked a question at first; it was simple. But now, when I ask questions, it is not so simple. The answer is not clear; it can be discussed. (P4)

Questions without an answer make people think more. (P7)

I mean, the questions of my friends, it should not be like discrediting them in general but, I don't know, when I look at their questions, for example, the thing related to flying, "why do they put stars in the sky?" says in that question for instance. I don't think it is suitable for Socratic thinking. I mean, there cannot be different comments on this. I think it will usually be on things that are abstract Such feelings or .. I do not know. (P9)

Since everyone’s perspective is different, almost everyone’s questions were good. (P4)

Because it's their thoughts after all. It must be respected. (P5)

When the above quotations are examined, it is seen that: The participants see the purpose of asking questions as revealing different perspectives; They were able to generate more questions at the end of the Socratic inquiry seminars; The questions they ask developed from simple to difficult, and they think that they increase their qualifications by asking questions that have no answers, that can be discussed more and are logical. In addition, it is seen that the participants evaluated the questions in terms of suitability to the Socratic inquiry, and they respected the questions and perspectives of the other participants.

Findings regarding Contribution Theme

As a result of the data analysis obtained from the interviews with the participants, the *contribution* theme was divided into two sub-themes: *personal development* and *daily life*. The codes determined for these sub-themes are given in Table 2.

Table 2.

Sub-theme and Code Table regarding Contribution Theme

Theme	Sub-theme	Code	Participant
Contribution	Personal Development	Gaining a new viewpoint	P1, P6, P7, P9
		Creating different ideas	P1
		Asking questions to oneself	P1
		Being able to change his/her mind	P2, P7
		Detecting good questions	P3
		Answers to the interview questions	P4
		Curiosity	P4
		Empathy skill	P6, P2
		Foresightedness	P6
		Defending one's own opinion	P6
		Supporting-defending others	P6
		The right to express thoughts freely	P6
		To be a scientist	P7
		Listening others	P9
		Commenting on others’ ideas	P9
		Being like a philosopher	P9
		Socratic thinking	P8
	Daily Life	Give detailed answers to the questions in the lessons	P4
		Acquiring new information	P1, P5
		Asking a question	P2, P6
Thinking in-depth		P2	
Having a different perspective on life		P7	
	Solution-oriented approach to a problem	P8	

According to Table 2, the participants generally stated the contributions of Socratic inquiry seminars to their personal development as; they gained different perspectives and made changes in their ideas, asked questions to themselves, developed their curiosity, empathized, supported others in addition to defending their ideas, had the right to express their thoughts freely and could make philosophical inquiries. Examples of quotations on Socratic inquiry seminars' contributions to the personal development of participants are presented below.

Now I look at events from different angles, I can see those through different people's perspectives. I can come up with different ideas. (P1)

You can look at something from different angles, listen to them, comment on it. Socratic thought comes from Socrates anyway. He is a philosopher, just like him, to be able to look at a subject from different angles and make different interpretations. So, from now on it added things like this to my life and now I think about them. (P9)

I started asking myself questions a bit. I've already noticed. There are times I say why I am doing this. (P1)

Fortunately, I participated it. Because I saw properly good questions. (P3)

Now it adds a little empathy. After all, someone says different points of view, for example, a friend of mine and I always looked from different perspectives. And throughout all the things, I first thought about it, tried to understand it, thought what s/he said and what I said. For example, if what I said makes more sense to me, it may be, if what his/her said makes more sense, OK, I would say that s/he was right, but because what I said was more logical, I defended my own. So, it can give you some empathy ability from here. Different points of view, after all, there are so many different points of view, it also provides foresight. I think so. In the end, I think it improves defending your opinion, supporting others, defending their ideas, and the right to express your thoughts freely. (P6)

It made me closer to being a scientist. I mean I'm in the development process. Let's say this information I learned, for example, is a gun. The information I will learn later in the future is a bullet. So, even if there were bullets, we would not be able to shoot the bullets without a gun. We can think like that. (P7)

When examining the above quotes in terms of the personal development of the participants, we find that they comment on taking different perspectives, making different interpretations, questioning themselves, recognising qualitative differences between the questions asked, approaching different views with empathy, listening to other speakers, which is necessary for healthy communication, and building a foundation in the scientific development process. According to Table 2, sample quotations for the participants' opinions such as gaining new information about the contributions of Socratic inquiry seminars in their daily lives, asking questions, thinking in-depth, and approaching the events with a solution-oriented approach are presented below.

For example, I also acquired new information from the materials we read there. I can use them in my daily life, for instance. (P1)

You know, we asked questions more interestedly, when I ask such questions in daily life, I think more. When I answer in that way, or when they say something comes out of there, I extract a thought, information according to it, I mean when I think more interestedly. (P2)

For instance, in the social lesson at school, the teacher asks questions, the answers of people from here are detailed. Others' answers are straight. (P4)

For example, I learned a different view of life here. I do it by trying it differently. For example, I used to think of it a little differently. But now my perspective has changed a little more. So, that's why my view of life is better now. (P7)

From the above excerpts, participants indicated that they can use the information they acquired in the Socratic questioning seminars in their daily lives, that they can think more deeply by getting into the habit of asking questions, that they can give more detailed answers to questions by justifying their explanations during the seminars, and that they can look at life from different perspectives.

Findings regarding Feeling Theme

As a result of the analysis of the data obtained from the interviews with the participants, the *participants' feeling* theme created by the Socratic questioning seminars was divided into two sub-themes: *positive* and *negative feelings*. The codes determined for these sub-themes are given in Table 3 below.

Table 3.

Sub-theme and Code Table regarding Feeling Theme

Theme	Sub-theme	Code	Participant
Feeling	Positive	Like a scientist	P2
		Like on the discussion program	P4
		Not understanding how time passes	P4, P6
		Fun	P1, P3
		Loving different ideas	P2, P6
	Like a deputy in the Turkish Grand National Assembly	P9	
	Negative	Being bored	P2

According to Table 3, the positive feelings of the participants in the Socratic inquiry seminars was determined as; feeling like a scientist, feeling like a deputy in the Turkish Grand National Assembly, not understanding how the time passed, loving different ideas and fun. Sample quotations of the positive feeling code are presented below.

We can express our thoughts like this at home, but when we are in such a circle of friends, such controversial and different opinions emerge. I feel myself as in the Turkish Grand National Assembly, like I'm a deputy there, I feel like I can explain my thoughts freely. (P9)

I say I'm glad I came. It has already contributed a lot to me. We had fun at the same time. (P1)

I felt like a scientist. I mean, as if I was a scientist, I was investigating something, as if I was discussing it, as if the people next to me were scientists, too. I felt like we were trying to decide what was the right one. (P2)

It was fun. Connecting the bones of the dinosaur. Watching videos and discussing. I had fun. (P3)

I am a person who likes to look from different angles while discussing. I'm just not that fixed minded. I mean, I can change my mind. So, I just felt that if I see two or three points of view, I can

see even more different points of view on Earth. How many people were we here, it was going like 10, 7, 8. But now many people, we were divided into at least three groups here while discussing. Now if these 7-8 people are divided into three groups, what would the world be like? How many different points of view are there? So, I liked that it happened. It was good. I like to discuss over such an idea. I like it. (P6)

According to the above quotations, it can be said that the participants were in a discussion environment and were able to express their opinions freely, which had a positive effect on them. They felt stimulated because they felt like scholars and were curious about other perspectives and saw other perspectives. The negative feeling reflected in the Socratic inquiry seminars belonged to one of the participants by saying “*At that time I couldn’t find anything to say. I just sat and bored. It was actually fun, but I was bored because I couldn’t find it myself (P2)*”. According to this statement, although the participant states that he is bored when he is not involved in the inquiry, it can be said that he finds it fun to be included in the inquiries in the seminars.

Findings regarding Liking Theme

As a result of the data analysis obtained from the interviews with the participants, the *liking* theme for Socratic inquiry seminars was divided into two sub-themes: *liked* and *disliked*. The codes determined for these sub-themes are given in Table 4 below.

Table 4.

Sub-theme and Code Table regarding Liking Theme

Theme	Sub-theme	Code	Participant
Liking	Liked	Speech bars	P4
		Reading texts-videos	P4, P8, P2
		Discussion environment	P4, P8
		Applying new things in life	P5
		Asking questions	P8
	Disliked	Activity	P7
		Disrespect in the discussion	P8
		Nothing	P1, P2, P3, P4, P5

When Table 4 is examined in the Socratic inquiry seminars of the participants, it is seen that: they like the activities in the applications, the speech bars used in the application, asking questions in the discussion environment, and adding a novelty to their lives with these applications. Examples of direct quotations for these codes are presented below.

You know those sticks or something, I liked them very much. You know they gather and talk about something, I felt like I was in a place like that. We take turns speaking, I liked it. The discussion environment was good. P7 was fine. You know, “Teacher, that’s such and such..”; those answers were very good. The discussion environment was also nice, I have nothing to complain about. (P4)

I loved that we were discussing about science. We were watching something or reading something. We were asking questions about it. We were finding the titles, we were finding the topics. I think it was nice. (P8)

From the above extracts, it is clear that participants were happy to speak sequentially thanks to the language bars used as material for the application, the application process and the science discussion environment. In Table 4, it is seen that there are participants who stated that they did not like an activity in Socratic questioning seminars and that they did not like the hostile outbursts in the discussions; in addition to participants who stated that there is nothing they did not like. Sample quotations regarding the theme of taste are presented below.

Sometimes there were very hostile outbursts. But it wasn't much. (P8)

I'm just not very good with paper, such as cut and paste, that's all. (P7)

I wouldn't change anything. Everything was perfect. (P2)

No, I think everything was perfect. (P4)

From the above excerpts, one of the participants was uncomfortable with the bilateral dialogues that appeared from time to time in the discussion environment and negatively affected the discussion, while another disliked the activities of cutting and pasting the papers. In addition, five participants stated that everything was fine in all applications.

Findings regarding Suggestion Theme

As a result of the analysis of the data obtained from the interviews with the participants, the *suggestion* theme for Socratic inquiry seminars was divided into two sub-themes: *changing* and *adding*. The codes determined for these sub-themes are given in Table 5 below.

Table 5.

Sub-theme and Code Table regarding Suggestion Theme

Theme	Sub-theme	Code	Participant
Suggestion	Changing	Workshop diary	P6
	Adding	Continuation of the workshop	P6, P9

According to Table 5, it is seen that what participants want to change in Socratic inquiry seminars is the reflective diaries, and what they want to add is the continuation of the seminars. Excerpts from the statements where the participants expressed their views are presented below.

For example, I don't like to write, OK it is good to write a poem, but I am not a person who likes to write like that. I mean, if we talk like this instead of writing a diary, or if everyone talks about their opinions one by one, maybe it would be better. Because when you talk like that about your diary, it will be better. I mean, writing makes me lazy, to be honest, I don't like it very much, it is better to talk like this. (P6)

I loved it. I would like it to happen again, but unfortunately, it won't. (P9)

What I want to add is the continuation of it. (P6)

From the excerpts above, it appears that one of the participants suggested that the diaries with reflections be kept orally rather than in writing. This is indeed the case, this change suggested by the participants was applied during Socratic inquiries, and the participants were enabled to make more qualified reflections about the process. In addition, it seems that what the participants want to add to the Socratic inquiry seminars is the continuation of the seminars.

Conclusion and Discussion

When the findings of this research investigating the opinions of SAC students about Socratic seminars are examined, it is determined that the students have very positive views towards the process.

It was found that the students of SAC evaluated the Socratic inquiry process as they were able to freely express their thoughts, obtain important information, gain scientific experiences that contribute to their development, recognize individual differences, interpret the process as a good method for developing discussion, and initiate discussions about science by creating questions. In addition, it was found that they discussed the concept of debate in a positive way by relating it to science, regardless of the negative meaning used in daily life, and they believed that seminars are a process in which they aim to question the accuracy of the information acquired. With these results, the statement included in the Science Curriculum (MoNE, 2018) that "Students should be able to express their opinions comfortably, support their opinions on different grounds, and for developing opposite arguments to refute their friends' claims, environments should be provided where they can discuss the benefit-harm relationship for scientific facts." overlap. Therefore, it can be said that Socratic inquiry seminars are an effective practice to achieve the targets determined for the environment of Science lessons. In Zeybek's (2019) study, students also commented positively on the impact of the Socratic method of inquiry on learning and personal development. They also stated that the Socratic method of inquiry positively affected the class climate in general, that discovering mistakes and shortcomings together and finding the right thing to do together strengthened class communication, cohesion and solidarity, and also positively affected communication between teachers and students. Based on the opinions of the students of SAC about the questions in the Socratic inquiry seminars, it was found that they saw the purpose of asking questions as showing different perspectives, that they were able to formulate more questions at the end of the seminars, and that they felt that they increased their questioning skills by evolving from the questions they defined as easy with clear answers to the questions they saw as difficult with no answer, and which could therefore be discussed more. In the literature, there are studies showing that preschool children who participated in the "Philosophy with Children" curriculum improved the level of questions they formulated in the philosophical exploration processes, and the quality of their answers (answering questions, explaining the reason, giving examples, and the number of words used) also developed (Yildiz-Demirtas et al., 2018). In addition, it was determined that the participants evaluated the questions in

terms of conformity to Socratic inquiry and respected the questions and perspectives of the other participants. Similarly, in Zeybek's (2019) study, students stated that Socratic inquiry method increased their expressiveness and communication skills because it is a student-centered method and it leads them to think and speak; especially after the first application, they stated that they started to respect different ideas more, and could evaluate and develop their ideas together with those different ones.

Contribution of Socratic inquiry seminars to SAC students' personal development according to their own opinions is determined as; gaining different perspectives and making changes in their ideas, questioning themselves by asking questions on their own, distinguishing qualitative differences between questions, developing a sense of curiosity, approaching different opinions with empathy, supporting others as well as defending their own ideas, making different comments, finding the right to express their opinions freely, listening to other speakers which is necessary for healthy communication, making philosophical inquiries, and seminars' providing the basis for the scientific development processes. In the studies in the literature, it is stated that Socratic inquiry contributes to the student's in-depth analysis of a subject or problem, to have an opinion on that issue, and to be able to freely comment on and approach critically to other thoughts and suggestions (Bozer & Kurnaz, 2016). Moreover, the Socratic method of questioning motivates students for the lesson because it arouses curiosity in them, they concentrate better on the lesson and listen to the lesson more carefully and attentively; the teacher's answering the question with a question encourages them to think and reflect; and when they are given the responsibility of finding the wrong and missing points, they are encouraged to question what they know so that they can look at any information with a critical perspective (Zeybek, 2019). As a result of the research, it was found that the contribution of the Socratic research seminars to the daily life of the students of SAC is that they are able to use the information gained, they have the habit of asking questions and thinking deeper, they give more detailed answers to questions at the end of the seminars, and they look at life from different perspectives. Similarly, Shahsavari et al. (2013) found in their study that students improved in their daily life in creating meaningful questions about a topic, thanks to Socratic inquiry practices.

It was found that SAC students of Socratic investigation seminars had positive feelings by loving different ideas, feeling as a scientist, as in the discussion program and as a deputy in the Great Turkish National Assembly, and that they may not understand how time passes while spending good and fun time. Some students stated that they were bored when they could not fully participate in the discussions, suggesting that it is positive and important for them to actively participate in the discussion. Therefore, it can be said that students' being in a discussion environment and being able to express their opinions freely reflect positively on them, they feel excited by feeling themselves like scientists and are curious about different perspectives as well as being able to see different perspectives. The students' expressing that they feel lucky, have fun, and have a good time attending these seminars during the applications supports the results obtained from the interviews. According to Schjelderup (2009), philosophical dialogues give students a model to formulate relevant questions, and thus students develop new knowledge based

on facts and experience. In this way, students learn the process that extends to formulating these answers instead of just learning ready-made answers and are directed to rational thinking. When students apply their own thoughts, they reveal their own knowledge. Thus, unlocking the potential for exploration can make the whole teaching environment exciting, where students are motivated and ready to participate.

It was found that the students of SAC liked the activities in the Socratic research seminars, the activities carried out, the application process, the possibility of speaking sequentially thanks to the talking sticks used, asking questions in a discussion environment about science and adding a novelty to their lives with these practices. In the process of Socratic questioning seminar, the stages of establishing the rules of the session, presenting the stimulus (story, object, picture, etc.), thinking about the stimulus, asking questions, making a connection between the questions, choosing the question to be philosophically questioned, developing thoughts about the question, following others' thoughts, and encouraging them to ask questions directly affect the children's thinking and questioning skills (Trickey & Topping, 2004). On the other hand, negative opinions about the seminars were determined as the result of some activities not appealing to the students' individual interests. Some students sometimes felt uncomfortable with the bilateral dialogues that appeared in the discussion environment and negatively affected the discussion. In Zeybek's (2019) study, students mentioned that there might be deviation from the topic due to irrelevant answers from students about Socratic method of inquiry, some students realising that they gave wrong answers might disturb it, and unnecessary discussions in the classroom from time to time. However, according to Schjelderup (2009), a philosophical dialogue is created by the tension between the commonalities and differences of the participants. Communication stops and becomes meaningless without differences between mutual understanding, experience style, and perspectives. There is no improvement without difference (Schjelderup, 2009). At this point, it can be thought that the discussions that emerged in Socratic inquiry seminars are very important for the development of individuals and a question perceived as irrelevant or wrong may have the opportunity to turn into a new and stimulating question during the seminar.

Finally, in the study, SAC students stated that what they want to be changed in their suggestions for Socratic inquiry seminars is the reflective diaries, and what they want to add is the continuation of the seminars. In Zeybek's (2019) study, too, students stated that they wanted to repeat the Socratic inquiry practices because they found them quite different and interesting. In addition, the students in this study suggested that the journals in which post-application reflections were recorded should be oral rather than written for future seminars. In fact, this change suggested by the students during the Socratic questioning seminars was considered in this study, and from the fifth application onwards, the students' reflections were recorded orally, and more qualified reflections on the process were made. According to De Schrijver et al. (2016), students' findings can be collected after exploring relevant ideas through different discussions, explanations, and research cycles in the dialogue process. This stage enables the facilitator to evaluate the impact of the dialogue on students' concepts of the nature of science and students' thinking deeply on their own reflection processes. This last stage

can lead to the rediscovery of the stimulus used to start the discussion or to different stimuli that can be explored to continue the processes of learning the nature of science. Therefore, the importance of encouraging students to reflect on written or oral seminars is evident in this study. In general, according to the results obtained from this study, it can be said that students' experience of Socratic inquiry seminars contributed significantly to their personal development and usage in daily life.

Suggestions

According to the results obtained from this research conducted to determine the opinions of SAC students on Socratic inquiry seminars, the positive developments observed in students in these seminars, which are applied only once and for 10 weeks within the scope of Socratic inquiry seminars, can be reinforced with longer practices. Socratic Inquiry Workshops or courses can be opened at SACs to ensure this continuity.

In order for more students to benefit, not only in SACs but also in secondary schools, students can be given the opportunity to experience the Socratic research process. In this regard, training for teachers and teacher candidates can be conducted to spread the impact of Socratic inquiry seminars. In this study, activities on science, scientist, scientific method and scientific knowledge were selected for students to make Socratic inquiries. In the practices, it is aimed that the students will gain experience in the Socratic inquiry process rather than achieving the expected gains about these issues. For this purpose, Socratic inquiry seminars can be planned, and applications can be made at different levels, subjects, and lessons.

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