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Primary Teachers' and Students' Images of Teachers and Learning Environments

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Abstract

The aim of the study was to reveal the learning environments created by primary teachers in science classes and their teaching styles and compare them with the learning environments and teaching styles that their students dream of. Qualitative survey research design was used to find an answer to the research problem. In this study, the Draw-A-Science –Teacher-Test Checklist (DASTT-C) was used to collect the data. The DASST-C was developed by Thomas et al. (2001) and a useful tool to show how science teaching environment is and how teacher behaviors in the science teaching environment are. A total of 50 primary teachers and 120 primary school students (third and fourth graders) participated in this study. The DASST-C score sheet was used to analyze the data and the criteria proposed by Şahin-Kalyon (2020) were used to evaluate the learning environment. The findings revealed that the images of the participating teachers about themselves showed that they have almost adopted each teaching style equally. In other words, the teachers have adopted student-centered, teacher-centered, and both teacher and student-centered teaching equally. In the drawings of the participating primary school students, the most frequently depicted image of teacher was the teacher with an explicit teaching style, followed by the exploratory teaching style, and conceptual teaching style. In other words, most of the students depicted a teacher adopting the teacher-centered teaching in their drawings. The analyses revealed that the students of the teachers with the exploratory and conceptual teaching styles largely illustrate teachers in their drawings with the exploratory teaching style. The students of the teachers with the explicit teaching style also largely illustrated teachers in their drawings with the explicit teaching style. The study showed that the teaching style teachers have and the learning environments they adopt are similar to the teacher images students have and the learning environments they portrayed.

Keywords:
Learning Environment, DASST-C, Teaching Style, Science Teaching

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Introduction

When it comes to the learning environment, the first thing that comes to mind is a room consisting of desks lined up one after another, a teacher desk in front of these desks, a teacher cabinet, and a blackboard. However, the learning environment corresponds to much more than

September 2020, Volume 13, Issue 1, 155-167

this. The learning environment refers to in-school or out-of-school environments and cultures in which students accomplish learning. The elements that make up this culture are students, teachers, and other elements in the learning environment. The learning environment includes student-teacher and student-student interaction and what the teacher does to make the educational environment suitable for the student. While creating the learning environment, in addition to the physical elements of the educational institution (classes, laboratories, etc.), the students' characteristics, the culture to be generated, methods to measure learning, and activities that best support learning are taken into account. Creating a complete learning environment for students as part of a specific course or curriculum is perhaps the most creative part of the teaching profession (Bates, 2015). The teacher should assume important responsibilities while creating the learning environment. Teachers play a critical role in the learning process because they have many responsibilities, such as planning both in-class and out-of-class scientific activities, forming study groups, and helping students acquire the necessary skills (Bakır, 2016). This is rather a complicated cognitive activity, as the teacher needs to combine pieces of information from different areas (content knowledges, teaching strategies, curriculum knowledge...etc.) together to plan and teach a subject (Magnusson et al.,1999).

Today, learning environments are places where students are responsible for their learning, seeking solutions to real-world problems, thus opportunities to explore the natural world are offered. To do so, curricula are renewed to educate individuals with the required qualifications. For this reason, the characteristics and roles that teachers will have also change. Thanks to the renewed curricula, teachers adapt to their new roles, learn how to guide students, and prepare the best learning environment (Yıldız-Duban, 2013).

There are two theories that try to explain how individuals learn. The first is known as the behaviorist theory, which tries to explain learning through observable and measurable behaviors, and the second is the cognitive theory, which tries to explain learning through mental processes. Learning environments can be traditional and constructivist. If you want to be successful in teaching children science, you must use both theories and combine them with the constructivist theory (Abruscato & Derosa, 2010 as cited in Ulu, 2012).

As in every school subject, one of two approaches, traditional or constructivist, is generally preferred in science teaching. In a classroom where the traditional approach is adopted, the teacher only transfers scientific facts to students, as students often passively receive the information. In a class where the constructivist approach is adopted, some students are actively involved in the inquiry, discovery, and learning processes (Del Greco et al., 2018). A teacher allows students to discover scientific facts. He/she is not in the role of an information conveyor; rather, he/she offers guidance.

The constructivist approach is considered one of the most effective ways to learn and teach science (Lay & Khoo, 2013). In this approach, students actively participate in the process, perform activities, and make observations. Then, they learn what the information they have attained means by sharing what they have acquired through activities and observations with their friends. In a nutshell, students internalize scientific facts because they experience science as a process of doing something or looking into something (Lay & Khoo, 2013). Primary teachers know well how to design learning environments and guide students to develop students' understanding of scientific knowledge and method in science classes. To this end, he/she asks some of the following questions: "What shall I do with my students to help them understand this science concept? How should I organize the learning environment? What materials are there to help me? How should I evaluate my students?" Almost Every teacher tries answering such questions, and these questions are there to be answered by teachers who are dedicated to doing the best for their students (Magnusson et al., 1999).

While searching answers for these questions; teachers try different ways to teach students the best. There is no one valid way of teaching. Different teachers may adopt different teaching styles. Therefore, the teaching style a teacher has is thought to be important. The concept of teaching style is very different from the method of instruction used by a teacher. Two teachers can both use same teaching methods, and still differ identifiably from each other (Fischer & Fischer, 1979).

Teaching style is the combination of the type of teaching peculiar to each teacher (Fischer & Fischer, 1979), teaching behaviors consistently demonstrated by teachers in the learning-teaching process (Üredi & Üredi, 2007) and their knowledge of pedagogy, behaviors in the classroom, preferred teaching methods, beliefs and needs (Grasha, 2002).

The teaching styles possessed by teachers determine many elements of the teaching-learning process such as information sharing in the teaching-learning process, preferred teaching methods, materials used and classroom interaction (Maden, 2012). Therefore, teachers' teaching styles gain importance. According to Koshy et al. (2000) consideration of teaching styles is important in mathematics education. The case is the same for the science course. It would be safe to conclude that what students learn about science and scientists in science classes is affected by the methods, teaching styles their teachers teach about science and scientists (Finson et al. 2006).

The activities performed, teaching styles used and what kind of learning environment is used in science classes, in primary school have an important effect on students who have an idea about what science and the nature of science are. At this level of education, all important skills, such as science process skills and producing arguments are imparted to students. Therefore, studies are needed to examine what a teacher does in the classroom and the classroom environment and what kind of science classes students want to be in and how kind of teacher they want to be with. However the literature revealed that studies examining the learning environment are usually conducted through scales (den Brok et al., 2010; Efe et al., 2007; Welch et al., 2014).

With this study, it was aimed to elicit the teaching style preferred by the teacher, the learning environment he/she creates, the teacher model that the student wants to be, and the learning environment in which the student wants to be present in drawings.

This study, in this context, examined the teachers' and students' images of the science teacher and learning environment. Previous studies revealed that the images of pre-service teachers were generally examined (Acisli, 2017; Akkus, 2013; Alkış-Küçükaydın & Gökbulut, 2020; El-Deghaidy, 2006; Üner & Akkus, 2016; Yılmaz et al., 2007), but studies examining the images of students are limited (Türkmen & Ünver, 2018; Ulu & Ocak, 2018; Yılmaz et al., 2008). In these studies where students' images of teacher in science classes were examined, the analyzes were made by one evaluation tool. In the current study on the other hand, the learning environments and teacher images of science classes drawn by both students and teachers were evaluated multiple evaluation tools by using different criteria and the findings obtained in the current study were discussed in reference to the literature. Therefore, the study is different from similar studies in the literature.

Classes and laboratories where science lessons are conducted are essential areas where ideas are translated into practice and both teachers and students achieve goals in science curricula (Hofstein et al. 1982). Also, this study is considered important because it presents both teachers' and students' images of science teacher and science learning environments comparatively.

Finally; teachers' teaching styles are thought to be a determining factor on the learning environments they create. For this reason, in the current study, it was discussed whether the learning environments that teachers present in their drawings are sufficient for science classes while revealing their styles as well.

Purpose of the Study

The aim of the study was to reveal the learning environments created by primary teachers in science classes and their teaching styles and compare them with the learning environments and teaching styles that their students dream of. To this end, the study has the following research questions:

1. What are the primary teachers' images of their teaching styles in science classes?

2. How are the teachers' images of the learning environment they create in science classes?

3. What is primary school students' image of the primary teacher in science classes?

4. What is primary school students' images of the learning environment in science classes?

5. How do primary school students' images of the primary teachers is related to their teacher's image of her teaching style in science classes?

Method

Research Design

The aim of the study was to reveal the learning environments created by primary teachers in science classes and their teaching styles and compare them with the learning environments and teaching styles that their students dream of. Fink recommends qualitative survey for the discovery of the meanings and experiences individuals attribute to events and situations (Jansen, 2010). Thus, qualitative survey research was used in the current study. Qualitative surveys collect information about the meanings people attribute to their experiences and the way they express themselves and provide data to answer questions such as: "What is X and how different people, communities and cultures think and feel about X and why?" Qualitative survey research does not aim to establish frequencies, or other parameters, but to determine the diversity of some areas of interest within a given population. Qualitative survey is the study of diversity (not distribution) in a population. Therefore, the aim in the current study while giving numbers is to emphasize diversity.

Researchers using qualitative surveys do not aim at representative or generalizable results, nor do they want to provide information about the "typical" or "average" individual. Their purpose for using qualitative questionnaires is to bring depth and individual meaning to the questions of interest. "Depth and uniqueness" rather than breadth and representation are their points of departure. Qualitative survey research is particularly useful when there are not many people to participate or you do not want many people to participate (Fink, 2003).

Participants

The selection of the participants is of great importance to find relevant answers to the research questions. The participants were expected to participate in the study on a volunteer basis. A purposive sampling method, including the snowball sampling method, was used to select a sample of heterogeneous groups of teachers and students. The participants of the study consist of 50 primary teachers and 120 primary school students. Table 1 depicts the number of students and teachers participating in the research.

Table 1. *Participants*

Participants	Grade		Total
	3	4	
Teachers	27	23	50
Students	58	62	120

In the study, first, data were collected from teachers, then the DASST-C score sheet was used to analyze the data, and teachers with exploratory, conceptual, and explicit teaching styles were determined. These teachers were asked if they could draw pictures to their students. Eleven teachers (5 third grade teachers, 6 fourth grade teachers) had their students draw pictures and delivered them to the researcher. In this way, 120 primary school students were reached.

Data Collection Tool

In this study, the DASTT-C, was used as the data collection tool. This test was expected to determine the participants' image of the science teacher and science teaching. The DASTT-C is a modified version of Draw-A-Scientist-Test Checklist (DASTC) developed by Finson et al., (1995) to determine student images of scientists. The DASTT-C instrument consists of two main episodes. In the first episode, participants are instructed to draw a picture of themselves teaching science, while asked the following two questions about their drawings in the second episode: "What is the teacher doing? and What are the students doing?" In this study, the DASTT-C was prepared separately for the teachers and primary school students. The items in the test prepared for the teachers were translated directly into Turkish. In the test prepared for the students, the item that instructed the participants to drawing was constructed differently. In the original test, the drawing instruction is as follows "Draw your own picture as a science teacher at work." The instruction in the student test used in this study is stated as follows: "If you were a primary school teacher, how would you conduct the science class? Please draw a picture." In the second part, the original statements are used in both tests (What is the teacher doing? and What are the students doing?)

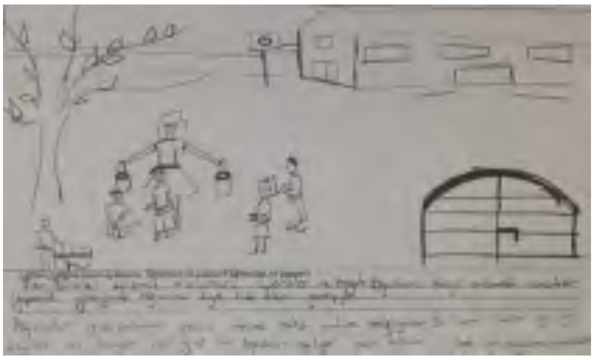
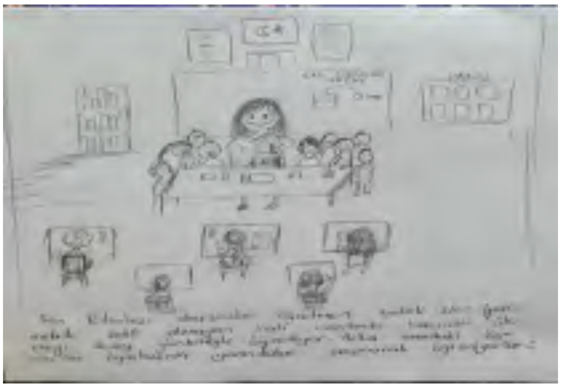
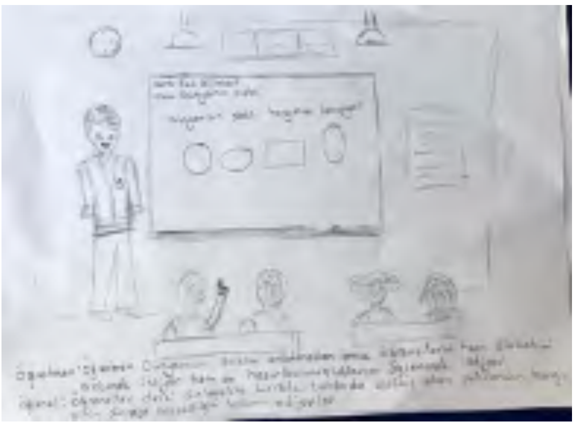
Data Analysis Approach

The data collected in this study were evaluated in two stages. In the first stage, a DASTT-C score sheet was used while in the second stage, the learning environment evaluation criteria of Şahin-Kalyon (2020) were used in the second stage. A DASTT-C score sheet is composed of three sections: teacher, student, and environment. The teacher section is divided into two subsections. The first section focuses on the teacher's activities, such as demonstrating, lecturing, and using visual aids. The second section focuses on the teacher's position (location concerning students and posture). The student section is divided into two subsections. The first section focuses on the students' activity (watching and listening, responding to teacher/text questions), while the second section focuses on students' positions (seated).

The environment section is a single section. This section focuses on the learning environment. Under this section, students' desks, the location of the teacher's desk, and the presence of materials are evaluated.

Scoring of the drawings is based on the absence or presence of the situations specified in the aforementioned sections. In other words, if one of the situations stated in the sections of the DASTT-C score sheet is present in the drawing, then 1 point is assigned, yet if it is absent, then 0 point is assigned. Thus, the lowest score to be taken from the test is 0, while the highest score to be taken is 13. A score between 0 and 4 represents student-centered images; a score between 5 and 9 represents both student and teacher-centered images, and a score between 10 and 13 represents teacher-centered images. These score ranges are categorized under the following three teaching styles: exploratory, conceptual, and explicit.

Exploratory teaching style (0–4): Teacher knows that his/her students are responsible for their learning and believes that students can manage the learning process. The curriculum is open to students' interests. The teacher leads and guides students' activities and inquiries. Alternative assessment methods are used in this teaching style. Conceptual teaching style (5–9): Teacher believes that students need themed and conceptual learning experiences. The teacher establishes connections between concepts and scientific processes. In teacher-centered classes, activities based on manual dexterity, group works, and

	Teacher	Student
Exploratory teaching style		
	T1: The teacher is planting seedlings for children so that they can learn by doing and experiencing. Students are allowed to actively participate by doing group work. Some are bringing seedlings while others are carrying water in buckets. Another group of students is arranging the place where the seedlings will be planted. Then, they will plant flowers and parsley.	T1S1 : The teacher has taught the subject of plants in the science class and then took the children to the garden to reinforce the subject. She introduces daisy, grass, and rose to them in the garden.
Conceptual teaching style		
	T5: In the science class, the teacher teaches how to measure the volume of rigid objects that do not have a specific geometric shape with the experiment method. The students in the back row are next to the teacher, and they learn by surprise.	T5S3: If I were a science teacher, I would do more experiments with my students.
Explicit teaching style		
	T9: Before the teacher explains the shape of our world, he wants to attract students' attention and wants to learn about their readiness. Students listen to the lesson and guess, which of the shapes drawn on the board looks like the world.	T9S1: The teacher lectures on the smartboard so that students can understand better.

T1: Teacher 1, T1S1: Teacher 1, Student 1

Figure 1. Sample Drawings of Teachers and Students

discussions are included. It is tested whether important concepts are understood. Explicit teaching style (10–13): Teacher believes that students lack knowledge and need help with learning. The curriculum is focused on specific outcomes. Lecturing means teaching. The teacher is the source of information and he/she initiates activities. The evaluation is focused on content knowledge. The teacher and student drawings were evaluated considering the abovementioned situations. Figure 1 depicts some samples of how the teacher and student drawings have been evaluated.

September 2020, Volume 13, Issue 1, 155-167

While scoring the drawing produced by the teacher coded as T9, the scores from three different sections of the DAST-C score sheet were summed. This teacher received 4 points from the teacher section in the score sheet, 3 points from the student section, and 4 points from the environment section; thus, he/she received a total of 11 points. After the drawings were analyzed using the DASTT-C score sheet, the elements included in the learning environment depicted in the drawings were also evaluated. While evaluating the drawings, the criteria proposed by Şahin Kalyon (2020) were used. These criteria are shown in Figure 2.

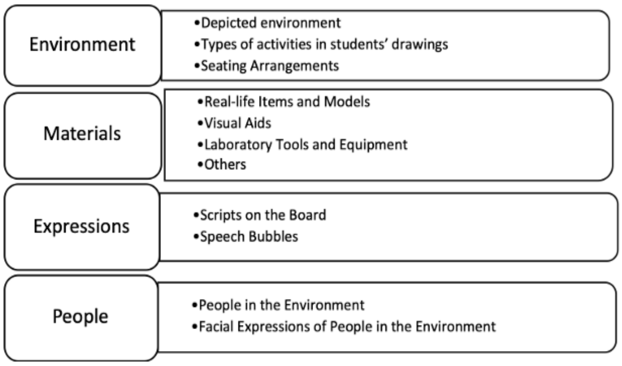


Figure 2. Themes of the Analysis

For inter-coder consistency, 30% of the data were sent to another researcher. In order to calculate the inter-coder consistency, the formula proposed by Miles and Huberman (1994, p. 64) was used. The consistency between the researchers was found to be 81%.

Results

Primary Teachers' Teaching Styles in Science Classes

To determine the teachers' teaching styles, a DASST-C score sheet was used. Through the scoring performed, the teaching styles of the teachers were found and are presented in Table 2.

Table 2. *Teaching Styles of the Teachers*

Teaching style	*n*	%
Exploratory teaching style	18	36
Conceptual teaching style	17	34
Explicit teaching style	15	30

As can be seen in Table 2, the distribution of the participating teachers across the different teaching styles seems to be equal, but the exploratory and conceptual teaching styles seem to be used by a relatively higher number of teachers than the explicit learning style.

When the pictures of teachers who have an exploratory teaching style are examined, it seems that these teachers generally depict students doing activities or experiments in/out of the classroom in their pictures. In the pictures, students are depicted doing experiments or activities individually or as a group. In the pictures, the teachers seem to make students discover the concepts to be instructed.

In the pictures of teachers who have conceptual teaching style, a group of students are doing activities or experiments, while the teacher includes other students in the classroom by asking questions. They also stated that they did the experiment together with the students.

In the pictures of the teachers who have an explicit teaching style, all of the teachers depicted themselves explaining the subject on the board.

Findings related to the teachers' attitudes towards the items in the DASST-C score sheet teacher section are given in Table 3.

Table 3. *Teacher Section of DASTT-C Data for Participants (teachers)*

	Teacher section of DASTT-C	*n*	%
Activity	Demonstrating experiment/activity	20	40
	Lecturing/giving directions (teacher talking)	24	48
	Using visual aids (chalkboard, overhead, and charts)	21	42
Position	Centrally located (head of class)	27	54
	Erect posture (not sitting or bending down)	37	74

Twenty primary teachers (40%) drew themselves, demonstrating experiment/activity and twenty-four primary teachers (48%) drew themselves lecturing and giving directions to the class. Twenty-one teachers (42%) drew themselves using visual aids, twenty-seven teachers (54%) drew themselves standing head of the class or behind the table or in front of the blackboard, and thirty-seven teachers (74%) drew themselves not sitting or bending down.

Table 4. *Student Section of DASTT-C Data for Participants (teachers)*

	Teacher section of DASTT-C	*n*	%
Activity	Watching and listening (or so suggested by teacher behavior)	20	40
	Responding teacher/text questions	21	42
Position	Seated (or suggested by classroom furniture)	25	50

Half of the participating teachers drew students sitting at their desks (50%). In twenty teachers' drawings, students were illustrated watching and listening (40%) while in twenty-one teachers' drawings, students were drawn responding questions, shaking her/his finger or responding test questions (42%).

Table 5. *Environment Section of DASTT-C data for Participants (teachers)*

	Teacher section of DASTT-C	n	%
Inside	Desks are arranged in rows (more than one row)	30	60
	Teacher desk/table is located at the front of the room	30	60
	Laboratory organization (equipment on teacher desk or table)	27	54
	Symbols of teaching (ABCs, chalkboard, bulletin boards, etc.)	31	62
	Symbols of science knowledge (science equipment, lab instruments, wall charts, etc.)	26	52

In their drawings, the teachers generally used the classroom as the setting. In the pictures drawn by thirty teachers, desks were arranged in rows (60%). In the drawings, the teacher desk was generally drawn in the middle of the classroom (60%). Laboratory organization or equipment on teacher desk was drawn by 54% of the teachers. Symbols of teaching and science knowledge were drawn by 62% and 52% of the teachers, respectively.

The Learning Environment Created by the Primary Teachers in Science Classes

The drawings of the primary teachers were evaluated within the following four themes: environment, materials, expressions, and people. Each theme consisted of some sub-themes.

Environment

As Table 6 illustrates, almost all primary teachers (*n*= 47) drew themselves in a classroom. Some primary teachers (*n*= 22) drew themselves as if they were doing an experiment. In the drawings of the teachers, in general, teachers were depicted conducting experiments while students were depicted making observations. In addition, in some drawings, only a few students were illustrated as doing experiments, while others were watching them. Some primary teachers (*n*= 13) drew themselves as if they had been lecturing and performing an activity (Table 6). Only two of the teachers included observations in their drawings.

Table 6 shows that the majority (*n*= 29) of the primary teachers drew students as sitting in a traditional-seating arrangement. Some teachers drew students in an individual (*n*= 2) classroom-seating arrangement either in a lab or a classroom. Others drew students in U-shaped (*n*= 6) or clusters (*n*= 5) seating arrangements.

Materials

More than half of the participating teachers drew real-life items or models in their drawings. Teachers reflected their use of real-life items in the classes into their drawings (n= 25). Only one teacher drew a world globe and one teacher drew the earth's crust model.
More than half of the teachers drew board and books as visual materials. The most frequently depicted item in their drawings is the board (n= 30). Generally, there are some writings related to the subject and content of the class and some questions on the board. Only seven teachers depicted glass materials in their drawings, while two of them drew two laboratory equipment; spirit lamp and trivet.

Expressions

On the boards in the drawings of the teachers, there are generally writings about the subjects taught (e.g., germination of a bean, movements of the world, sense organs, states of matter). There are questions on the board in the drawings of only two teachers, and on none of the boards in the drawings of the teachers, stages of conducting an experiment and materials used in an experiment were written.

People

There are students and teachers illustrated as people in all drawings of the teachers. Teachers and students were illustrated as happy people in almost all the drawings.

Table 6. *Features of the Environment in the Primary Teachers' Drawings*

Environment								
Depicted environment			Types of activities			Seating arrangements		
	n	%		n	%		n	%
Classroom	47	94	Experiment	22	44	Traditional (pairs)	22	44
			Activity	13	26	Individual	13	26
Laboratory	1	2	Lecture	13	26	U shape	6	12
						Clusters	5	10
Outdoor	2	4	Observation	2	4	No seating arrangement	8	16

Primary School Students' Image of Primary Teacher in Science Classes

A DASST-C score sheet was used to determine the primary school students' image of the teacher. The students' images of teacher are given in Table 7.

Table 7. *Teaching Styles of the Teachers*

Teaching style	n	%
Exploratory teaching style	42	35
Conceptual teaching style	29	24
Explicit teaching style	49	41

As Table 7 illustrates, the most frequently depicted image of a teacher in the drawings of the primary school students is the explicit teaching style (41%), followed by exploratory teaching style (35%), and conceptual teaching style (24%).

Findings related to the students' attitudes towards the items in the DASST-C score sheet teacher section are presented in Table 8.

Table 8. *Teacher Section of DASTT-C Data for Participants (students)*

	Teacher section of DASTT-C	n	%
Activity	Demonstrating experiment/activity	28	26
	Lecturing/giving directions (teacher talking)	58	55
	Using visual aids (chalkboard, overhead, and charts)	70	66
Position	Centrally located (head of class)	81	74
	Erect posture (not sitting or bending down)	91	86

Twenty-eight primary school students drew the teacher demonstrating experiment (26%), while 54 primary school students drew the teacher lecturing and giving directions to the students (55%). In 70 drawings of the students, the teacher was drawn using visual aids (66%), in 81 of the drawings, the teacher was depicted as standing head of the class or behind the table or in front of the blackboard (74%), and in 91 the drawings, the teacher was depicted as sitting or bending down (86%).

Table 9. *Student Section of DASTT-C Data for Participants (students)*

	Student section of DASTT-C	n	%
Activity	Watching and listening (or so suggested by teacher behavior)	65	61
	Responding to teacher/text questions	48	45
Position	Seated (or so suggested by classroom furniture)	63	59

More than half of the students drew students sitting at their desks (61%). In the drawings of 65 students, students were drawn watching and listening (61%), while in 48 of the drawings, they were drawn responding to the questions, or responding test questions (45%).

Table 10. *Environment Section of DASTT-C Data for Participants (students)*

	Environment section of DASTT-C	n	%
Inside	Desks are arranged in rows (more than one row)	69	65
	Teacher desk/table is located at the front of the room	62	59
	Laboratory organization (equipment on teacher desk or table)	15	14
	Symbols of teaching (ABCs, chalkboard, bulletin boards, etc.)	72	68
	Symbols of science knowledge (science equipment, lab instruments, wall charts, etc.)	25	24

In general, the participating students drew the classroom as the setting. In the pictures drawn by 69 students, desks were arranged in rows (65%). In the drawings, the teacher desk is generally drawn in the middle of the classroom (59%). Laboratory setting or equipment on teacher desk was drawn by 15 students. Some symbols of teaching and science knowledge were drawn by 68% and 24% of the students, respectively.

The Learning Environment in Science Classes Created by the Primary School Students in Their Drawings

The primary school students' drawings were evaluated within the following four themes: environment, materials, expressions, and people. Each theme consisted of some sub-themes.

Environment

Table 12 depicts that the primary school students drew themselves as teachers in the classroom (*n*= 90). The number of students drawing themselves in a laboratory is relatively small (*n*= 22). The number of students drawing themselves in an out-of-classroom setting is seven, while the number of students designing a special classroom is one. The students generally drew a teacher lecturing in the class (*n*= 56). Though the number of students drawing a teacher conducting an experiment is high, they indicated, as their teachers did, that they conducted the experiment as teachers (*n*= 48). In the drawings, while the teacher is depicted conducting an experiment, students are portrayed passively listening to their teachers. The number of students drawing the teacher that allows students to observe is six, and the number of students drawing the teacher while making students play is four.

Table 11 shows that the majority (*n*= 62) of the primary school students drew students as sitting in a traditional-seating arrangement. Some students drew students in an individual (*n*= 20) classroom-seating arrangement either in a lab or a classroom, while others drew students in U-shaped (*n*= 2), exclusive (*n*= 1), or laboratory (*n*= 8) seating arrangements.

Table 11. *Features of the Environment in the Drawings of the Primary School Students*

Environment								
Depicted environment			Types of activities			Seating arrangements		
	n	%		n	%		n	%
Classroom	90	75	Experiment	48	40	Traditional (pairs)	62	52
			Activity	2	2	Individual	20	17
Laboratory	22	18	Lecture	56	47	U shape	2	2
						Exclusive	1	1
Outdoor	7	6	Observation	6	5	Laboratory arrangement	8	7
Exclusive classroom	1	1	Game	4	3	No seating arrangement	20	17

Table 12. *Primary School Students' Image of the Primary Teacher in Science Classes According to Their Teachers' Learning Styles in Their Drawings*

	Teacher image of students		
Teacher's teaching style	Exploratory teaching style	Conceptual teaching style	Explicit teaching style
Exploratory teaching style (T1, T2, T3, T4*)	19 (48%)	14 (35%)	7 (17%)
Conceptual teaching style (T5, T6, T7, T8)	15 (37%)	13 (33%)	12 (30%)
Explicit teaching style (T9, T10, T11)	8 (20%)	2 (5%)	30 (75%)

**T4: Teacher 4*

Materials

More than half of the participating students drew real-life items or models in their drawings. In the drawings of the students in which they portrayed themselves as teachers, they generally used real-life items (*n*= 28). Only two students drew a world globe, and two students drew the earth's crust.

More than half of the students drew board and books as visual materials. The most frequently drawn material is the board (*n*= 71). This is followed by book (15) and computer (2). Generally, there are some writings about the subject or content of the course and some questions on the board. Forty students depicted glass materials in their drawings, while seven students drew the following laboratory equipment: spirit lamp, trivet, and magnifier.

Expressions

On the boards in the drawings of the students, there are generally writings about the subjects taught, such as germination of a bean, movements of the world, sense organs, states of matter, force, and movements. Unlike their teachers, students in their drawings also wrote the stages and equipment of an experiment.
People

In all the drawings of the students, students and teachers were portrayed as people. In almost all the drawings produced, teachers and students look happy.

Primary School Students' Image of the Primary Teacher According to Their Teachers' Learning Styles in Their Drawings

In this study, it was aimed to elicit both the primary teachers' and their students' images of the science teacher. Table 12 depicts data related to the comparison of the teacher image drawn by the primary school students and the image drawn by their teachers.

The pictures drawn by 40 students of the four teachers with the exploratory teaching style were analyzed. The findings of the analysis revealed that the teacher in the pictures drawn by 19 students was portrayed with the exploratory teaching style, in 14 of the drawings, the teacher has the conceptual teaching style, and in seven of the drawings, the teacher was portrayed with the explicit teaching style.

The pictures drawn by 40 students of the four teachers with the conceptual teaching style were analyzed. The findings of the analysis revealed that the teacher in the pictures drawn by 15 students was portrayed with the exploratory teaching style in 14 of the drawings, the teacher has the conceptual teaching style, and in 10 of the drawings, the teacher was portrayed with the explicit teaching style. The pictures drawn by 40 students of the three teachers with an explicit teaching style were analyzed. The of the analysis revealed that the teacher in the pictures drawn by 30 students has the explicit teaching style, in 2 of the drawings, the teacher was portrayed with the conceptual teaching style, and in 8 of the drawings, the teacher was illustrated with the exploratory teaching style.

Discussion

The purpose of this study was to reveal the learning environments created by primary teachers in science classes and their teaching styles and compare them with the learning environments and teaching styles that their students dream of.

The findings showed that the images of the participating teachers of themselves is almost adopting each teaching style equally. The scores from the DASST-C score sheet allow determining the teaching style of the teacher and making interpretations about whether the teaching conducted in the classroom is teacher-centered or student-centered.
Studies examining pre-service primary teachers or pre-service teachers from different branches revealed that teaching is generally either teacher-centered or both teacher-centered and student-centered (Akkuş, 2013; Alkış-Küçükaydın & Gökbulut, 2020; Elmas et al., 2011; Tatar, 2012). Unlike the findings in previous studies, the findings of this study revealed that the participating teachers equally used student-centered, teacher-centered, and both student and teacher-centered teaching. Some of today's teachers experienced traditional science learning with teacher-centered practices in the past. Therefore, they may still be conducting their lessons with teacher-centered practices. The other part of the teachers experienced science learning with student-centered practices. Based on their experiences, they may include student-centered practices in their own classrooms.

According to teacher interviews, the main goal of labwork was to connect theory to practice, stimulate interest and enjoyment, and practice laboratory skills and techniques (Ottander & Grelsson, 2006). Yet, the pictures drawn by the teachers showed that nearly half of the teachers preferred to do experiment themselves rather than let students do it. Therefore, in more than half of the pictures drawn, students were generally depicted sitting at their desks and listening to their teachers. The teachers generally preferred materials that are easy to find in daily life. The number of teachers drawing laboratory materials in their drawings was very small. This might be due to the lack of a laboratory in their schools. Another reason might be that the experiments conducted in elementary education require simple materials. Although the number of experiments conducted in the drawings of the teachers is high, the depiction of individual students conducting experiments is very limited. The reason why the teachers did the experiments themselves might be due to the shortage of necessary tools and equipment or lack of time. When the relevant literature is reviewed, it is remarkable that teachers do not conduct experiments at different education levels for various reasons. In their study conducted on 120 science and technology teachers, Demir et al. (2011) found that the majority of the teachers think that the main obstacle in front of their use of laboratory and technology is lack of equipment and shortage of class hours. In the existing research, it has been reported that school administrators are not competent enough to solve problems due to their indifferent behaviours in problems related to laboratories or because their fields of expertise are not related to science lessons (Ayvacı & Küçük, 2005; Karakolcu Yazıcı & Özmen, 2015). This seems to be a major obstacle for teachers who want to use laboratories. In the study where the opinions of classroom teachers about laboratory applications were revealed, teachers think that the experiments had little effect on the retention of the learned information (Uluçınar et al. 2008).

The teachers generally depicted the classroom as the setting in their drawings. Only three teachers chose a laboratory or an out-of-classroom setting in their drawings. The reason for not having a laboratory in their drawings might be due to the lack of a laboratory in their schools. It has been revealed that the knowledge and attitudes of classroom teachers towards outside learning environments are low. (Türkmen, 2015). The fact that teachers do not draw outside classroom environments in their pictures may be due to their low level of knowledge and attitude towards the method mentioned.

It is possible to say that out-of-classroom settings are natural laboratories for science classes. Thus, it can be suggested that out-of-classroom settings should be frequently used for science classes (Şahin-Kalyon, 2020). Yet, only two of the teachers participating in this study depicted a lesson delivered in an out-of-classroom setting in their drawings. When the drawings of the teachers depicting an in-class learning setting were examined, it was seen that the students sat in the traditional seating arrangement. Besides, there are some teachers drawing students seating in clusters or U-shaped seating arrangement.

The teachers depicted board/interactive board and book as visual-teaching materials in their drawings. It was determined that the teachers who drew the board in their drawings generally wrote information on the subject they taught on the board. This might indicate that the teachers are actively using the board.

The most frequently depicted teacher image in the drawings of the students participating in this study was the teacher with the explicit teaching style, followed by the teachers with the exploratory teaching style (35%), and the conceptual teaching style (24%). In other words, the teachers mostly depicted the teacher who has adopted the teacher-centered teaching style in their drawings. In their study, Ulu and Ocak (2018) concluded that 29% of the fourth-t and fifth-grade students have the student-centered science teaching mental model, 59.9% have both the student and teacher-centered science teaching mental model, and 10.7% have the teacher-centered science teaching model.

In their study, Yılmaz et al. (2008) found that 18.2% of the primary school fourth-grade students had the student-centered science teaching mental model, 56.4% have both the student- and teacher-centered science teaching mental model, and 25.4% have the teacher-centered science teaching mental model. The findings of this study are not in exact compliance with the findings of previously conducted studies. Türkmen and Ünver (2018) concluded that 4.5% of the primary school students have the student-centered perspective of science teaching, 36.4% have both the student and teacher-centered perspective of science teaching, and 59.1% have the teacher-centered perspective of science teaching. This finding is similar to the finding of this study. In the drawings of the students, the teacher is mostly teaching the lesson or doing the experiment himself/herself. Therefore, the students were drawn seating at their desks. The participating students generally depicted the classroom as the setting in their drawings. It is seen that the number of students drawing a teacher teaching in a laboratory or an out-of-classroom environment is very small. Şahin-Kalyon (2020) asked students to draw their dream science classes. One of the findings of this study is that 10% of the students indicated that they dreamt of learning in out-of-classroom settings. In this study, however, only 2% of the students indicated in their drawings that they would teach in out-of-classroom settings, if they were teachers. The students generally depicted a teacher lecturing in their drawings. Although the number of students drawing a teacher doing an experiment is high, they also depicted the teacher as doing the experiment himself/herself rather than making students do the experiment. In these drawings, the teacher is depicted as doing the experiment while students are depicted as passive listeners. When the drawings of the students depicting the learning environment in the classroom were examined, it was seen that the students sat in the traditional seating arrangement. Some real-life materials and models are portrayed in some drawings of the primary school students. In their drawings, the students mostly depicted board/interactive board, book, and computer as visual-teaching materials. The students drawing board in their drawings were found to write information about the subject taught on the board. These findings are similar to the findings obtained from the teachers' drawings. This study examined both the primary teachers' and their students' images of the teacher in science classes. The study findings revealed that the students of the teachers with the exploratory teaching style and conceptual teaching style mostly drew a teacher with the exploratory teaching style in their drawings. The students of the teachers with an explicit teaching style were also observed to mostly draw a teacher with an explicit teaching style.

Some of today's teachers experienced traditional science learning with teacher-centered practices in the past. Understanding the nature of science and how science should be taught are related to such learning experiences. Research has shown that past learning experiences and teachers' images and teaching beliefs are related (Tobin et al, 1990; Thomas et al, 2001; Thomas & Pedersen, 2003). The current study also showed that the teaching style teachers have and the learning environments they adopt are similar to the teacher images students have and the learning environments they portrayed. In the study, the students imagined themselves as a teacher, albeit for a short time, and drew an imaginary classroom. Considering the results obtained, it is possible to say that the students' teaching styles and teacher images are affected by their teachers. The current study was conducted on elementary level. Similar studies can be done at different levels of education to look for similarities and differences. If similarities are found, different evidence will be obtained to say that the teaching style of teachers has a relationship with students' teacher images. This evidence can be motivating for teachers to review their teaching styles.

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