Full research paper

HOW TEACHERS IN ELEMENTARY SCHOOLS EVALUATE THEIR CLASSROOM ENVIRONMENTS: AN EVALUATION OF FUNCTIONS OF THE CLASSROOM THROUGH AN ENVIRONMENTAL APPROACH

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ABSTRACT

Understanding the educational environment and effectively regulating it in consistent with educational objectives is an important factor in facilitating teaching and a crucial ability for the teachers. Investigating the perception of 12 classroom teachers at four elementary schools about their classroom environment, this study aims to reveal the situation about their classroom environment, its effects, and the desired classroom environment in terms of the functions of the classroom environment. Two analytical frameworks, Classroom Functions Theory as well as Environmental Competence, are means to understand this topic. A semi-structured interview form and an observation form were used as data collection instruments. In the study, it was observed that the majority of teachers were able to evaluate the classroom environment, but they remained unsolved about how the classroom can be designed better. Besides, the teachers stated that their classroom environments performed social, symbolic identity, and task instrumentality functions in a limited way for various reasons while largely functioning the shelter and security. Finally, the teachers emphasized that their classes did not fulfill growth and pleasure functions and that most of their desires about the classroom environment were related to these functions.

KEYWORDS

Perception of teachers, classroom environment, functions of the classroom, environmental conditions, and environmental competence

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Highlights

- *Classrooms fulfilled the function of shelter and security considerably.*
- *Classrooms performed the functions of social, symbolic identity, and task instrumentality in a limited way.*
- *Classrooms hardly served the functions of pleasure and growth.*
- *A classroom that serves all its functions facilitates the other dimensions of classroom management*

INTRODUCTION

Is no matter where learning and teaching take place for an effective teacher and enthusiastic students a truth? Now, it has been understood that it is a favorable legend (Taylor and Enggass, 2009). Even if the classroom learning environment distinguishes merely by its physical properties (Frenzel, Pekrun and Goetz, 2007), it is related to the areas of psychology, such as environmental, educational and social psychology (Graetz, 2006; Lackney, 1994).

The research has revealed that the inconvenient physical conditions of the classroom environment, in terms of the arrangement of the desks, light, and indoor climate, disturbs the concentration, engagement and clear mind of the students in the educational process (Powers et al., 2020; Ford, 2019;

Malik and Rizvi, 2018). In turns, these negative effects hinder their academic learning (López-Chao et al., 2020; Asino and Pulay, 2019; Han, Moon and Lee, 2019; Richardson and Mishra, 2018; Barrett et al., 2017; 2015). Furthermore, the classroom environment provides students a setting for teacher-students and peer interaction (Obaki, 2017; Weinstein and Novodvorsky, 2015; Amirul et al., 2013). Additionally, the environment, which allows sharing of experiences, ideas, emotions, and knowledge, is an essential device for their social development and behavior management (Memari and Gholamshahi, 2020; Obaki, 2017; Amirul et al., 2013; Guardino and Fullerton, 2010). The spatial, colourful and functional classroom environment also plays a crucial role in the satisfaction of students and teachers (Han, Moon and Lee, 2019; Earthman and Lemasters, 2009; Uline and Tschannen-Moran, 2008). However, educators have still distinguished the learning environment from the education process (Clark, 2002). The design of the classroom environment received less attention than instruction and behavior management (Weinstein and Novodvorsky, 2015; Horne, 1999).

The present study, therefore, has sought how elementary school teachers evaluate the classroom environment, the desired classroom environment, and how they arrange its physical and psychological properties. Two analytical frameworks have guided this study in determining evaluations of the elementary school teachers about the current and desired classroom environments and their arrangements. Classroom Functions Theory suggested by Steele (1973) and adapted to the classroom environment by Weinstein and Novodvorsky (2015) has provided a comprehensive understanding of the multidimensional nature of the classroom environment and its effects on teachers and students. This theory has revealed that the classroom environment is not only an area for teaching activities, but rather a part of social life (Weinstein and Novodvorsky, 2015; Taylor and Enggass, 2009). Also, Environmental Competence has enabled us to conceptualize awareness about the classroom potentials and skills in its arrangement to educational activities (Lackney, 2008; Steele, 1973). This study provides a valuable contribution to raising awareness about the visibility of the classroom environment to teachers and the researchers and its importance for students and teachers and regenerating interest in teachers' classroom environmental competence.

Functions of the classroom environment

The functions of the classroom environment enable a beneficial framework to evaluate it in detail and indicate that it is much more than a few bulletin boards (Asino and Pulay, 2019; Weinstein and Novodvorsky 2015), or heating and lighting conditions of the environment (Baum, 2018). A classroom environment has six functions: shelter and security, social contact, symbolic identification, task instrumentality, pleasure, and growth (Steele, 1973). *Shelter and Security* can be defined as the ability to provide a safe and comfortable learning environment, physical and psychological, to students (Weinstein and Novodvorsky, 2015). The physical aspect of the classroom can be related to the comfort level of teachers and students during teaching (Puteh et al., 2015). Elements of the physical environment in the classroom, such as heating, lighting and air quality, have a significant impact on student outcomes (Barrett et al., 2017; 2015; Hurst, 2005). A comfortable environment in terms of the quality of desks and light facilititates learning (Hill and Epps, 2010).

The *Social Contact* function of a classroom is the ability to regulate the quality and quantity of interaction among students and between students and the teacher (Weinstein and Novodvorsky 2015). The arrangement of the classroom environment affects, for example, the distance between the teacher and the student and the possibilities of visual interaction (Cardellino, Araneda and Alvarado, 2017). Furthermore, the students' seating position in the classroom limits their access to information and thoughts of the other students and restrains sharing their knowledge and feelings with their teacher and peers (Weinstein and Novodvorsky, 2015; Fernandez, Huang and Rinaldo, 2011; Marx, Fuhrer and Hartig, 2000).

The function of *Symbolic Identification* of the classroom environment is defined by Weinstein and Novodvorsky (2015) as the provision of information about the teacher's goals, values, and beliefs on education, as well as students' products, activities, and achievements. How the classroom is arranged gives various messages about learning and social expectations (Harris, Shapiro and Garwood, 2015). The classroom environment is filled with both, teaching activities that take place during the learning process, and desirable behaviors stated by the teacher (Weinstein and Novodvorsky, 2015), as well as indicators of the teacher's appreciation of students (Weinstein and Novodvorsky, 2015; Burden, 2000).

The *Task Instrumentality* function is considered as the organization of the classroom environment in line withe the teaching approach. The arrangement of the physical environment varies with the role of the teacher, the pedagogy and the learning activities (Fernandez, Huang and Rinaldo, 2011; Doyle, 2006), as well as the teaching strategies (Fernandez, Huang and Rinaldo, 2011; Sztejnberg and Finch, 2006; Clark, 2002) during the teaching process. The *Pleasure* function of the classroom environment is defined as the ability to arrange the environment as a fun space for teachers and students, and finally, the *Growth* function, understood as the way the classroom is organized to support students' development (Weinstein and Novodvorsky, 2015).

Environmental Competence

Classroom environment and its physical conditions are integral and nonpassive components of the learning process (Taylor and Enggass, 2009). Since physical setting associates with teaching and learning actions. If the classroom is designed in a traditional way, the strategy used in the course will be teacher-centered. On the other hand, various student-centered activities will be preferred in flexible learning environments (Martin, 2002). Most of the teachers cannot recognize this relation and the others think that nothing is under their control about the structure of their classrooms (Lackney, 1994). However, they have the capacity to influence many elements in their environments (Martin, 2002). The only thing they need have environmental competence. Environmental competence can be defined as "the ability to understand and effectively use physical instructional space for

a pedagogical advantage" is conceptualized as environmental competence (Lackney, 2008: 133).

Steele (1980) conceptualizes environmental competence as learning about the environment. The researcher states that it includes three different learning types related to characteristic properties, knowledge about the physical setting, and functional ability. These learning types can be explained as: characteristics refer to attitudes to physical environment and awareness about it; knowledge about physical situation is acquiring information about technical issues and environment-behavior relation and; functional ability represent the skills in organization and personalization. Lackney (2008) attributes a lack of environmental competencies to individual, social and organizational factors. Individual factors can be linked with three learning types suggested by Steele (1980), while the social and organizational factors can be identified with norms, rules, inadequate sources, and unawareness of other people.

The aim and significance of this study

The classroom environment is not a "black box" in the teaching-learning process (Harris, Shapiro and Garwood, 2015: 765), though it is a neglected issue for educators and researchers (Weinstein and Novodvorsky, 2015; Amirul et al., 2013; Horne, 1999; Lackney, 1994). While the interest in the planning of teaching is very high, the arrangement of the environment in which the teaching and learning takes place has received little attention in the literature (Horne, 1999). However, it could be claimed that all of the classroom functions together work for or against both the attitudes of teachers and students and the learning of the students. All classroom functions serve to facilitate learning and teaching and eagerness to be there. If the classroom arrangement enables to fulfill all of them, it will ensure positive attitudes towards the school in teachers and students or vice versa.

The research also indicates that adequate classroom facilities and their spatial arrangement contribute not only to the physical environment by providing a safe environment and wide range of stimulus to facilitate academic learning (Amirul et al., 2013), but also provides the social context that offers vast opportunities for interaction with peers and decreases undesirable behaviors (Obaki, 2017; Amirul et al., 2013; Guardino and Fullerton, 2010). On the other hand, inadequacies and disarrangements of the classroom environment result in an increase of disruptive student behavior, attention and motivation difficulties as well as reduction of teacher energy levels (Şahin, Tantekin-Erden and Akar, 2011; Di Giulio, 2007; Martin, 2006). Although teachers cannot control all factors in this environment (Lackney, 1994), the arrangement of the classroom is one of their responsibilities, even before the teaching and learning process begins (Suleman and Hussain, 2014; Sterling, 2009; Emmer, Evertson and Worsham, 2006). Indeed, the understanding of the classroom environment is a very important element for the creation of effective and efficient learning environments (Weinstein and Novodvorsky, 2015; Sztejnberg and Finch, 2006; Martin, 2002; Lackney, 1994). Therefore, teachers that are not aware of importance of the classroom environment and its condition are not able to arrange it (Martin, 2002).

Awareness of the functions of the classroom environment and the ability to design it in line with their educational objectives; that is, environmental competence, is an ability every teacher should have (Weinstein and Novodvorsky, 2015; Hannah, 2013; Doyle, 2006). The environmental awareness and environmental competence of the teachers and attitudes towards environment associate with each other (Memari and Gholamshahi, 2020; Clark, 2002; Horne, 1999). If we can raise environmental awareness of the teachers, we can improve their environmental competence and positive attitudes to environment. This research aims to determine the perception of elementary school teachers on the current situation, their arrangements, and the desiredsituation of their classrooms in terms of six functions of the classroom and their effects.

METHODOLOGY

Research design

This study has been designed under phenomenology approach from the qualitative research method. The aim of this research is to determine the perception of elementary school teachers of their classroom environment. As such, a research method where further information can be obtained about the nature or meaning of directly lived experiences is needed. The phenomenology design provides a deeper understanding of the participants on a real-world phenomenon by conducting in-depth interviews and focusing on the common part of their perceptions (Fraenkel and Wallen, 2005).

Study Context

Elementary, or primary, education in Turkey takes 4 years (i.e., children between 66 months and 72 months begin primary school and complete this school level when they are about 11 years old) and is compulsory. One of the main objectives of this education in the country is to 'prepare each Turkish child for life and higher education by educating them in terms of their interests and abilities' (MoNE, 1973), and elementary school teachers are instructed to fulfill this objective. Between years 1973 and 1974 their training consisted of a two year programme in an educational institute; between 1990 and 1993 its was a four-year courses at colleges of education, and since 1993 it is the duty of the University Faculties of Education (MoNE, 1992).

The study cases include four private schools and four public ones located in the different central districts of Antalya with three elementary teachers working in each school. The teachers were selected through the convenience and maximum diversity sampling method by considering their gender, type of school, grade levels, experience and class size.

- School 1: public primary school in Konyaalti, Antalya. The school has 33 elementary school teachers. The school provides dual education, i.e. secondary school level education in the morning (07.20–13.10) and primary school level education in the afternoon (13.20–18.30). Although the school was established a long time ago, the school building has been recently renovated.
- School 2: private primary school located in Kepez, Antalya. It provides education from kindergarten to secondary school level with 4 primary school teachers. This school is funded by an institution with different branches in various regions of Turkey.

- School 3: private primary school located in Döşemealtı district of Antalya province. It provides education from kindergarten to secondary school level. With an international reputation, the school has one branch in Antalya.
- School 4: public school located in the Muratpasa, Antalya. There are 15 classroom teachers in elementary level. Full-day education is provided to its students between 08.30–14.30. There is optional study activity for students after 14.30.

Participants

12 elementary teachers working in Antalya were participants. Those teachers were from four different schools. They had different properties in tearms of age, experience as a teacher, graduation, school type and grade level. Demographic information about participants is presented in Table 1.

Participants	Age	Experience as a Teacher(in years)	Graduation	School type	Grade level	Classroom size
Fatma (School 1)	50	25	Department of physics	Public	4	24
Arzu (School 1)	38	20	Education institution	Public	2	26
Ali (School 1)	45	23	Turkish teaching	Public	1	25
Elif (School 2)	24	1	Elementary school teaching	Private	3	5
Ebru (School 2)	26	3	Elementary school teaching	Private	2	4
Fatih (School 2)	40	17	Elementary school teaching	Private	2	17
Esra (School 3)	35	11	Postgraduate	Private	3	16
Asiye (School 3)	52	30	Associate degree	Private	1	15
Ahmet (School 3)	37	16	Elementary school teaching	Private	4	23
Irmak (School 4)	43	21	Elementary school teaching	Public	3	41
Aylin (School 4)	49	30	Undergraduate	Public	2	40
Sami (School 4)	45	27	Undergraduate	Public	4	42

Table 1: Demographic information of participants (source: own interview, 2020)

Instruments

The data collection used semi-structured interviews and observations prepared by the researcher, and carried out based on a protocol. While preparing instruments, the concepts of Environmental Competence adapted to teachers by Lackney (2008) and Classroom Functions Theory suggested by Steele (1973) and adapted to the classroom environment by Weinstein and Novodvorsky (2015) were taken as the basis of this research. It was claimed that these two analytical framework enabled to address the topic comprehensively, and contributed to the validity of the research. The classroom environment serves students and teachers with six functions: shelter and security, social contact, task instrumentality, symbolic identification, growth, and pleasure (Weinstein and Novodvorsky, 2015). For this purpose, a semi-structured interview protocol and an observation protocol were prepared within the scope of the classroom environment's functions related to the current situation, their arrangements and the desiredclassroom environment to determine the environmental competence of teachers. The semi-structured interview protocol included seven main questions, six of them were related to the function of the classroom environment, and the last one was about its effects, as well as three probe questions related to the current situation, their arrangements and desired situation of the classroom environment.

Procedures and Process

The data were collected by the researcher during the academic year 2020. For the meetings, firstly, the researcher made an appointment with the teachers and schools to explain the purpose of the research. And then, the appropriate time was agreed with the teachers for the interview and observation. In order that teachers were able to evaluate the classroom environment more comfortably, the interviews were held in their classrooms when students were in the school garden for physical education lessons. Each interview lasted between 25 and 35 minutes and was recorded with a voice recorder. After the interview data was transcribed, the teachers were asked to confirm their statements. Also, 120 minutes (3 lesson hours) were observed for each teacher. A nickname was given to each teacher, considering ethical rules and the contribution to obtaining reliable findings.
In the analysis process, the NVIVO 9.0 program was used and adopted the content analysis method. The purpose of the content analysis was to bring together similar data through common themes determined by the researcher and ensure that the data were understood and interpreted (Patton, 2001; Yıldırım and Şimşek, 2013). Data analysis was carried out using six stages specified by Creswell (2014) during the content analysis process. Firstly, the data were prepared and arranged for analysis. Secondly, to gain an overview, all of the data were read. Thirdly, research data were coded based on the functions of the classroom environment. Fourthly, data related to the environment were described. Fifthly, the descriptions and codes were arranged through the themes in the tables. Finally, the findings were interpreted.

Validity and Reliability

In this study, the validity and reliability were evaluated through two stages: validity and reliability of the instruments and the analysis process. The validity of the instrument means that it can measure the intended structure exactly (Fraenkel and Wallen, 2005). In the qualitative research, giving an expert opinion about whether the instrument can measure is a way for determining the validity of the instruments (Yıldırım and Şimşek, 2013). Cizek (2020) suggested cognitive interviewing that included the examination of the meaning of the questions, necessary knowledge for answering, experiences, and judgment process of the participants

in the evaluation of the questions, to ensure the validity of the contents of the interview instruments. In the first stage, two faculty members who had previously worked as teachers evaluated both interview and observation protocols. They considered these forms in terms of appropriateness, meaningfulness, and usefulness with the purpose of this study. As for the reliability, 'A reliable research procedure delivers the same result on the same sample at different times or on different but equivalent samples' (Dick, 2014: 683). Based on this ground, Fraenkel and Wallen (2005) offer that interviewing with a participant one more time is a way to determine the reliability of the instrument. For this purpose, the researcher of this study interviewed a teacher two times as a pilot study and compared the answers in terms of consistency.

In the second stage, the validity and reliability of the analysis process were ensured by giving importance to participant diversity, verifying the data, calculating internal consistency coefficients, arranging detailed tables, and making comparisons with national and international relevant studies (Yıldırım and Şimşek, 2013; Patton, 2001). As stated before, the researcher made sure to select participants with different attributes related to school districts, gender, type of school, grade level, their experience as a teacher, and the class size (See Appendix I). Secondly, each teacher verified their statements after the transcription of the interviews. Thirdly, a specialist with a master's degree in education management coded the research data independently from the researcher to calculate internal consistency coefficients (See Appendix II). The internal consistency between the two codings was calculated by Cohen Kappa analysis. The result obtained (Cohen Kappa,.838) showed that the internal consistency between themes was excellent (Landis and Koch, 1977: 165). Fourthly, the findings were presented in detailed tables under results heading. Finally, the results of this research were compared with national and international relevant studies under the discussion heading.

RESULTS

Under this heading of the research, the results of the interview and observation data analysis regarding the evaluation of classroom environments in terms of classroom functions were included.

The results of observation data about the evaluation of classroom environments in terms of class function

Observations and views about the security and shelter function of the classrooms

When the observation data on shelter and security functions were examined, it was seen that all classrooms had air conditioners and the teachers could control heat of the classrooms. But there were some problems related to furnitures in some classrooms. The desks were too high for elementary school students and there weren't enough curtains for the windows. Considering the arrangement of the teachers, it was seen that all of the teachers designed their classrooms considering the location of the technological devices, and they took account of the physical inadequacies of the students in arranging the seating.

Consistent with the observation data, Table 2 suggested that the participant teachers stated that their classroom environments were generally adequate in terms of heat and light and ventilation functions, although some teachers stated that the desks were rather high for the students, and they had difficulty in cleaning the classroom. They stated that they arranged their classroom to provide learning comfort by considering students with physical disabilities. For instance, Ali said that *"Our class has its own heating and cooling system. We can get the optimum level of heat at any moment. The windows are very well designed, so we can get intense levels of light. The ventilation system works flawlessly. About the seating arrangement, if the children have a physical disability such as vision and auditory, I consider it. I wish I had a class where I could create a different order."*.

As for their opinions about a desired classroom, they offered suggestions on light, height of desks, space usage, and the possiblitiy of creating different desks arrangements. For example, Ebru stated that *"Due to the location of the classroom, the windows and lack of curtains, it gets very hot in the summer, and this prevents me from using the smartboard efficiently. Moreover, students are polluting the classroom a lot. If only, the class space was more functional, there would be no cleaning problem."*.

Function of the physical environment		Current situation	Arrangements	Desired Situation
Security and Shelter	Heat	Optimal (*n* = 9)	Private air conditioner (*n* = 9)	
	Light	Optimal (*n* = 10)	Controlling of artificial light (*n* = 7) Benefitting from natural light (*n* = 5)	Benefitting from natural light (*n* =2)
	Ventilation	Sufficient number of windows (*n* = 12)		
	The height of the deks	Very high (*n* = 4)		Proper desk height for student development (*n* = 4)
	Cleanliness	Failure in classroom cleanliness (*n* = 2)		Making all areas in the class functional (*n* = 2)
	Comfort in learning	Seating the students with visual and hearing disability in the front desks (*n* = 8)	Designing the seating arrangements suitable for the students with disability (*n*=8)	Designing different desk arrangement (*n* = 8)

Table 2: Elementary school teachers' views on the security and shelter function (source: own interview data presentation)

Observations and views about the social contact function of the classrooms

Regarding the social contact function of the class, it was observed that the majority of teachers were careful to access to all students and bring them with different social and academic levels together, but most of them used the traditional desk order. This situation made the interaction between teacher and student and among the students more difficult. When conducting group work, students only had the opportunity to interact with the student sitting next to them, in front of, or behind them.

Table 3 confirmed the observation data. As seen in Table 3, most of the participant teachers stated that the students could interact with the teacher easily in the classroom, and some teachers indicated that the classroom environment did not prevent the interaction among students. For instance, Elif stated that "*Our classroom arrangement has a U-shape. Students can communicate with each other at any time. I can see all of them, I can interact with them all.*".

Some teachers, on the other hand, thought that the traditional desk arrangement and the disproportion between number of the students and the class space negatively affected the interaction between the teacher and students, and among students. Related to this function, it was observed that teacher tended to seated children with different characteristics together, and they regularly moved the students to different places, so that each student had equal access to the teacher, thereby increasing interaction amongst students. For a desiredclassroom environment, teachers wished that they could use different desk layouts, and a better balance between class sizenumber of the students and class space. In relation to this, Irmak expressed that *"It is difficult for me to walk around, and our movements are limited because the class is narrow. The interaction of students with each other is possible only at close range. It is difficult for every student to communicate with me. I wish my classroom would be large enough to form the U-shape.".*

Functions of the physical environment		Current situation	Arrangements	Desired Situation
Social Contact	Accessibility to teacher Accessibility of a student to others	Proper (*n* = 8) Traditional desk order barrier (*n* = 6) Limited peer sharing (*n* = 4) A disproportionality between class size and class space (*n* = 8) Proper (*n* = 4)	Rearranging seating periodically (*n* = 8) Seating children with different characteristics together (*n* = 11)	Designing U desk order (*n* = 6) Having a space for cluster work (*n* = 2) A balance between class size and class space (*n* = 8)

Tablo 3: Elementary school teachers' views on the social contact function (source: own interview data presentation)

Observations and views about the symbolic identification function of the classrooms

Regarding the function of the symbolic identification of the class, the observation data indicated that the noticeboards were inadequate in all classes, the walls were not used efficiently in some classrooms, and the teachers did not have a personal area, which prevents the class from fulfilling this function.

As seen in Table 4, there was a consistency between the observation data and the interview data. All teachers agreed that there were not enough boards in their classrooms, and many mentioned that they did not have their own personal space. A few teachers stated that they could not arrange the environment as they wanted because they shared their classes with other students. Related to this function, a few teachers stated that they used the walls and windows as exhibition areas, while many teachers stated that they could not exhibit student works as much as they desired. Also, teachers who did not have a personal area stated that they did not make any arrangements in this regard. For a desired classroom environment, all of the teachers stated that there should be a large number of appropriate height boards, a space for the teacher, and the transition to single education. For insrance, Elif reported that *"There are not enough boards in our class, and I hang the students' products on the windows. If I had more boards, I would display more student products. Also, I think every lesson should have a board, and there should be a place for the teacher in every classroom.".*

Functions of the physical environment		Current situation	Arrangements	Desired Situation
Symbolic Identification	Board	Insufficient number of bulletin boards (*n* = 12)	Using walls and windows as exhibition areas	A large number of boards in the classroom and at students' height
	Sharing of classrooms	Double shift schooling (*n* = 3)	Limited number of students' works on boards	Eliminate double shift schooling
	Teacher's area	Lack of personal space for teachers (*n* = 8)		Design of personal space for teacher

Table 4: Elementary school teachers' views on the symbolic identification function (source: own interview data presentation)

Observations and views about the task instrumentality function of the classrooms

Considering instrumentality function, the teachers who had available space and uncrowded classrooms could practice more student-centered activities and cope with the undesired behaviors faster than the other teachers. Furthermore, it was seen that both the students and teachers had difficulties in accessing teaching materials since the majority of teachers did not have suitable places for teaching materials.

The interview data presented in Table 5 was in line with the observation data. Some of the teachers stated that classroom environments were suitable for practicing various teaching activities. However, most teachers stated that they did not have an available area for different techniques. In addition, some teachers stated that they had difficulties in monitoring students and managing time due to the classroom environment.

While some of the teachers stated they could use different classroom designs, others argued that they designed the classroom considering the place of technological devices. Teachers who had difficulties with classroom management stated that they preferred to place students with behavioral problems in different corners of the classroom. For a desired class, teachers suggested having activity areas for both students and themselves and to be able to create different layouts. For instance, Arzu stated that *"Our classroom space limits my teaching methods and techniques. I can't use cluster activities. The crowding and tightness of the classroom affect my time management negatively. It is difficult to walk around in a narrow classroom and to watch the students. If I could arrange the class, I would like to have a class that is large enough to make a U shape and change the desk arrangements for group work."*.

Functions of the physical environment		Current situation	Arrangements	Desired Situation
Task Instrumentality	Suitability of the classroom environment for different teaching techniques	Proper (*n* = 6) Limited teaching technique (*n* = 6)	Design the classroom differently Design the classroom considering the place of technological devices (*n* = 8)	Areas for students to work in groups Area for the teacher activities
	Classroom management	Difficulty in watching students (*n* = 2) Difficulty in managing time (*n* = 4)	Seat students with behavior problems in different corner of the classroom	Arrange desks differently
	Place for teaching materials	Lacking of space (*n* = 11)		

Table 5: Elementary school teachers' views on the task instrumentality function (source: own interview data presentation)

Observations and views about the growth function of the classrooms

When the growth function of the classroom were considered, it was observed that there were no spaces in the classrooms that could contribute to the development of students outside the class. There were not any activity areas such as reading, science and maths areas.

Table 6 showed the views of the teachers about this question were similiar to the observation data. Most of the teachers stated that they did not have a reading area in their classrooms, and some stated that they did not have any activity areas for different lessons. Other teachers, on the other hand, did not express an opinion on this matter. The teachers stated that they could not make any arrangements regarding the related function, but most of them stated that an desired classroom should have reading and activity areas. In relation to that, Ali indicated that *"There are no areas in our classes where we can do different activities. Students are waiting without doing anything when they complete their duties before their friends. If I could organize my class, I would design activity corners. For example, I would arrange a corner where children who finish their work early can read books, a corner where they can play chess, or separate corners for each lesson."*.

Functions of the physical environment		Current situation	Arrangements	DesiredSituation
Growth	Activity areas for lessons	No activity area (*n* = 3)	-	Have a suitable area for activities (*n* = 3)
	A reading area	No reading area (*n* = 7)	-	Have a reading area (*n* = 7)

Table 6: Elementary school teachers' views on the growth (source: own interview data presentation)

Observations and views about the pleasure function of the classrooms

Considering pleasure function of the classrooms, the observation data indicated the fact that the walls of classrooms were pale colors did not encourage students to spend a fun and effective time in the classroom.

In line with the observation data, Table 7 suggested that some of the teachers argued that the color of the walls is not suitable for students in their classrooms, and some stated that there are no resting and playing areas for students. However, other teachers did not express an opinion on this function. The teachers stated that they could not make any arrangement regarding the related function, and they stated that a desired classroom should have more vivid colored walls and resting and playing areas. For instance, Ebru expressed that *"On rainy days, students cannot go out during breaks. They have to spend time in classrooms*

and corridors. I would like to have a playground in one corner of my class, a class library, and a resting area in the other corners, so they can spend time in these areas. Furthermore, I would like the class to be very colorful.".

Functions of the physical environment		Current situation	Arrangements	Desired Situation
Pleasure	The colour of the walls	Unsuitable (*n* = 4)	-	More colourful walls (*n* = 5)
	A resting and playing area	There isn't (*n* = 5)	-	A suitable area for it (*n* = 7)

Table 7: Elementary school teachers' views on the pleasure function (source: own interview data presentation)

Observations and views about the effect of the classroom environment on the teachers and students

The observation data suggested that there were differences in satisfaction of the teachers and students. It was observed that in classrooms where class size and the number of students were not proportional, the teachers got more tired, and the student complained much more than in other classrooms. On the other hand, in uncrowded classrooms, the teachers and students were happy.

In the interviews, the teachers who stated their satisfaction with their classroom environments emphasized the positive effects on them, their students and the learning and teaching process. They reported that when they were working in their classroom, they were motivated and satisfied. Besides this, they believed their lessons were quite effectively, and their students were happy. For instance, Asiye expressed that*"I love my classrooms. I can use different teaching methods and activities, so I don't feel restricted, my job satisfaction is getting higher, and my students are enthusiastic and happy. Moreover, they rarely behave undesirably; in this way, I can allocate more time to my students and teaching."*. On the other hand, the teachers, unsatisfied with their classrooms, underlined that working at these classrooms caused fatigue, unhappiness for teachers and students, and distractions in teaching and learning process. Furthermore, they claimed that they had difficulties in classroom management due to classroom arrangement. In relation to it, Irmak stated that *"I am so tired and my students aren't happy because I can't arrange my classroom. It is always messy whatever I do."*.

DISCUSSION

This study aimed to determine the perceptions of elementary school teachers about their classroom environment and the effect it has on their activities and to reveal their opinions about the desired classroom environment in terms of the functions of the classroom. Generally, the majority of teachers were able to evaluate the classroom environment. However, it was seen that teachers considered the classrooms had fixed structures, and the teaching environment was still arranged according to traditional teaching methods, consistent with the research of Martin (2006). Lackney and Jacobs (1999) also emphasized that the teachers were not sufficiently effective in designing their classroom environments. This might be due to the teachers' lack of knowledge about architecture and design (OECD, 1988). Their perceptions and observation data relating functions of the classroom have been discussed under the research questions in detail.

With respect to the first research question related to the perception of elementary school teachers on the security and shelter function, the teachers stated that the physical environment of their classes was generally appropriate in terms of heat and light. One possible explanation was they had artificial lighting and air conditioning systems in the classroom. Since most classroom environments had such facilities, they were often not considered (Graetz and Goliber, 2003). The adequate lighting of the learning environment had a positive impact on students' attention and eye health (López-Chao et al., 2020; Malik and Rizvi, 2018; Winterbottom and Wilkins, 2009), and affected the quality of their social and academic outcomes (López-Chao et al., 2020; Hurst, 2005; Burke and Burke-Samide, 2004; Graetz and Goliber, 2003). However, some participant teachers in this study complained that they were not able to benefit from daylight sufficiently. Daylight was much more beneficial than artificial lighting (Malik and Rizvi, 2018), which causes the student to feel sleepy and lazy (Hannah, 2013). Therefore, where possible, daylight should be used more (Roskos and Neuman, 2011; Graetz and Goliber, 2003).

Teachers also stated that they were satisfied with the temperature levels in the classrooms. The teachers can control the temperature in the classroom through temperature climate control system at any time, but the central heating system cannot adjust the heat to classrooms' conditions, so it might cause the classroom to be too hot or too cold (Hannah, 2013). The amount of heat in the classroom influences students' concentration and performance during the learning process (Hannah, 2013; Şahin, Tantekin-Erden and Akar, 2011; Wargocki and Wyon, 2007; Graetz and Goliber, 2003). Finally, some teachers evaluated the height of the desks were too high for the students. The size and placement of the items in the classroom that was not suitable for student development prevented comfort, safety, productivity and efficiency (López-Chao et al., 2020; Malik and Rizvi, 2018; Amirul et al., 2013; Burke and Burke-Samide, 2004). Concerning the observation data on their classroom arrangements, the majority of teachers used the traditional desk arrangement responding to the location of technological devices. For this reason, it could be said that they considered their classrooms fulfilled shelter and security and task instrumentality functions more than other functions.

As for the second research question, related to the views of elementary school teachers about the social interaction function, most of the participant teachers stated that their classrooms were appropriate for teacher-student interaction. They stated that they could reach all students and that the students could

easily interact with them all the time. All teachers tried to develop intimate relations with their students (Yıldızlı, 2021). However, other teachers emphasized that some characteristics, such as the physical size, great number of the students, and double shift schooling limited the teacher-student interaction. A great number of desk rows and traditional desk arrangement prevented teacher-student interaction (Ford, 2019; Cardellino, Araneda and Alvarado, 2017). Moreover, the narrowness of the classroom caused teachers to remain in the front of the class. Therefore, they had difficulty walking around the classroom and interacting with the students at the back of the classroom (Muthusamy, 2015; Onwu and Stoffels, 2005; Ehrenberg et al., 2001). Besides, it prevented changing the position of the teacher table in the classroom, and they were not able to observe the students properly (Hannah, 2013). Due to their crowded classroom, the teachers lacked opportunity to take care of, to monitor, or even to make eye contact with all the students during the 40 minutes lesson (Onwu and Stoffels, 2005; Finn, Pannozzo and Achilles, 2003). Finally, it was recognized that working at double shift schooling were not able to arrange the desks and bulletin boards in the classroom affected teachers negatively in their interaction with the students.

Considering the interaction among the students, it was observed that the classroom environment affected the quality and quantity of its social contact function. Most of the teachers stated that they preferred the traditional desk order, as the classroom environment was narrow compared to the number of students. The traditional desk order, however, inhibited students from communicating with their peers, as it limited the opportunity to see each others face and communicate with peers (Ford, 2019; Obaki, 2017; Hannah, 2013). Teachers with large enough classrooms relative to class size preferred arranging desks in a U shape and grouping in small clusters, emphasizing that these kind of arrangements allowed children to see, hear and communicate with each other better. In the literature, it was observed that as the physical distance between students decreased, they look at each other more positively (Van den Berg, Segers and Cillessen, 2012). Sitting in small groups enabled students to be more productive in their relationships and social skills (Powers et al., 2020; Farmer, Lines and Hamm, 2011; Patton et al., 2001). The crowded classroom in combination with the traditional desk order, caused noise in the classroom, and students sitting very close to each other exhibited distractive behaviors. Also, several teachers stated that these factors adversely affected classroom interaction. These were common problems in crowded classes due to the traditional order (Hannah, 2013), and the limited range of motion (Evans, Saegert and Harris, 2001; Lackney, 1994).

Another factor that determined students' interaction with each other was the seating arrangement in the classroom in relation to their deskmates. Where the students were seated encouraged them to communicate with each other (Baum, 2018; Culp, 2006). The teachers emphasized factors, such as ensuring peer sharing among students, the their desire to be fair, and considering students' physical disabilities, in arranging the seating plan. The seating arrangement is used by teachers to develop positive peer relationships (Farmer, Lines and Hamm, 2011; Van den Berg, Segers and Cillessen, 2012). Also, the researcher observed that the teachers considered there should be gender, academic, and social diversity between deskmates while arranging the seating plan. Culp (2006) stated that behavioral characteristics, learning needs, and the differences between students should be taken into account while making a seating arrangement. Having deskmates with different cognitive levels and interests supported the development of cooperation and leadership skills in a high-level student (Hannah, 2013), and the development of the other child seated with them in the academic and social field (Culp, 2006). Besides, the teachers indicated that they frequently changed seating arrangements to show fairness, as a student, sitting constantly in the back of the classroom, could feel punished. The students sitting in the back row were less willing to interact with the course materials and others (Pedersen, 1994).

In relation to the third research question concerning the evaluation of elementary school teachers on the symbolic identification function, most of the elementary school teachers stated that they used the boards in their classrooms for symbolic identity function. The teachers emphasized that they exhibited student work on the boards to improve their self-confidence and motivation as Memari and Gholamshahi, 2020; Weinstein and Novodvorsky (2015) and Di Giulio (2007) stated. The display of students' work was an indication that the teacher valued his work (Malik and Rizvi, 2018) because the classroom environment was a strong nonverbal variable and provided information about the teacher and student (Maxwell and Chemielewski, 2008). Displaying the products in the classroom increased the sense of belonging to the class for students (Killeen, Evans and Danko, 2003). Many teachers have stated that they enabled the students to display their products on boards, and some of them designed boards with their students. Student participation in classroom arrangement made students feel valued, increased their self-esteem and their sense of belonging to the school (Maxwell and Chemielewski, 2008).

In this study, the boards were placed quite high in most of the classes, although Sanoff (1991) stated that it was more functional for the boards to be at the eye level of the students. On the other hand, all of the participant teachers complained about the insufficient number of boards in line with the findings of Maxwell's (2000) study. However, it was observed that only two participant teachers designed walls as bulletin boards, and the other two teachers used the windows as exhibition space. The teachers could not use the walls effectively (Snow, 2002). One explanation of this inefficient usage could be that the school administration banned hanging anything on the walls. Finally, most of them emphasized a lack of personal space for the teacher, sometimes due to double shift schooling. The researcher observed that sharing desks and boards with students in other classrooms prevented the feeling that all students belonged to their classrooms. Furthermore, some teachers emphasized that the absence of their own spaces in the classroom affected the symbolic identity function negatively. The fact that teachers could not find a place to put their personal belongings, and even teaching materials, created problems in terms of time management during the teaching period and did not encourage the teacher to spend time in the classroom

outside the teaching process. Similiarly, Snow (2002) stated that very few teachers had an area to prepare for the lesson or to meet with a student individually.

Regarding the fourth research question, related to the perception of elementary school teachers on the task instrumentality function, the teachers informed that the physical size of the classroom environment was rather wide or narrow to carry out lessons effectively in line with the observation data. On the one hand, the narrow classroom limited teaching methods and techniques, and they usually applied teacher-centered methods because they lacked extra space to perform various activities. Powers et al. (2020) revealed that classroom design associated with teaching methods performed by teachers. The teachers having a narrow classroom prevented from using different teaching techniques (Ford, 2019; Duncanson, 2014; Blatchford et al., 2007; Snow, 2002), used the traditional desk order, and teacher-centered method (Martin, 2002). Like the teachers, each student needed a certain amount of space to perform activities in the learning process (Allen, Duch and Groh, 1996). When the personal space each student needed for learning had not been provided in the classroom environment, it could have affected his productivity, communication, and learning experiences negatively (Martin, 2006) in addition to increasing the negative behavior of students whose mobility was restricted. Teachers, on the other hand, might lose their control in large classrooms (Şahin, Tantekin-Erden and Akar, 2011).

Considering the fifth research question related to the opinions of elementary school teachers on the growth function, they were aware of the importance of this function, all of them desired classrooms that fulfilled it. Especially in crowded classrooms, the students who completed their works faster can feel bored while waiting their peers, on the contrary some students couldn't keep up with the learning speed of their peers (Kostolányová, Šarmanová and Takács, 2011). The function of the classroom could serve both groups of the students. It could provide extra activities for the speedy learners and complementary activities for slow learners. However, the shortage of space in the classroom prevented teachers from creating a reading corner, activity areas related to various lessons, and appropriate space to develop their psychomotor skills. And the observation data supported this results. Teachers complained about the limited areas of interest and discovery in the classroom environment (Obaki, 2017; Duncanson, 2014). A lack of visible educational materials restricted academic and social development for students owing to limited opportunity to interact with information and peers (Obaki, 2017; Weinstein and Novodvorsky, 2015; Di Giulio, 2007). When students could work somewhere apart from their desks, their peer relationships would improve and contribute to their social development (Van den Berg, Segers and Cillessen, 2012). Furthermore, empty spaces in the classrooms provided an opportunity for students to develop their creativity and experience directly (Lasky and Yoon, 2011).

As for the sixth research question related to the perception of elementary school teachers on the pleasure function, the partcipant teachers indicated that the limited range of movement of students in the classroom prevented them from playing games similiar to the research of Obaki (2017). Most of the classrooms lacked a rest area for break times outside the lesson period. Furthermore, it was stated that the paint colors in the classes are not geared towards children. Colors in schools reflected the official institutional identity. However, it was desired that the classrooms became a creative environment (Obaki, 2017; Warner and Myers, 2009). Teachers, students, and even parents thought that changing the school colors would make the school a better environment (Maxwell, 2000). Concerning the observation data, most of the classrooms resembled formal offices in terms of colors of the wall and arrangements of the devices, and they lacked an area for spare time activities.

Finally, the seventh research question related to the view of elementary school teachers on the overall effect of the classroom environment, it could be claimed that those teachers with optimum classroom environments were more satisfied than the others, their students were happier, and their learning processes were more effective. The classroom environment, where students were able to move comfortably, and the suitability of its factors, such as light, air, and classroom objects for student development, were positively associated with the learning and teaching comfort (Puteh et al., 2015; Asiyai, 2014; Clark, 2002), and the attitudes of teachers and students (Ford, 2019; Snow, 2002). The interesting classrooms facilitated the teaching-learning efforts, and the teachers who thought their classrooms were interesting were more willing in the teaching process than other teachers (Earthman and Lemasters, 2009). This interest reflected on the effectiveness of the teacher (Anderson, 2004; Snow, 2002) and the success of the teachers in education process was a source of motivation for them (Yıldızlı, 2021). Similiarly, the students thought that physical environment conditions had an impact on their learning and motivation (Asino and Pulay, 2019; Asiyai, 2014). In this study, it was observed that students had difficulties in sharing peers and focusing on the lesson.

The teachers who were unable to rearrange their classrooms for reasons of space or double shifting felt tired at the end of the day because they had to spend more effort during the teaching process. They were indecisive in various fields during the day, and they had various problems in terms of classroom management in the learning process Earthman and Lemasters (2009), Uline and Tschannen-Moran (2008), and Brophy (1988) pointed out that teachers made more effort to organize the environment in crowded classrooms, and the students in this classroom were distracted more quickly than other students. Furthermore, students with a poor classroom environment behaved in a more damaging way (Snow, 2002). During observation process, it was recognized that the classroom environment had an impact on both the teacher, the student and the teaching process in line with the perceptions of the teachers. The impact of the environment was continuous, and the quality of communication of the environment with the users depended on how the environment was regulated (Martin, 2006).

IMPLICATION, SUGGESTIONS AND LIMITATIONS

This study revealed that the growth, pleasure functions of the classroom were disregarded in classroom design, and no enterprises for classroom arrangement were made to compensate for these functions. Furthermore, the most effective factor in the arrangement of the classroom environment by the teachers was the placement of the technological devices determined by the school administration for the physical dimension of the classroom environment, and peer sharing among students for its psychological dimension. Finally, it could be asserted that school administrators had a responsibility as well as teachers in the arrangement of the physical environment of the classrooms. For this reason, it would be beneficial to cooperate with teachers, administrators, and experts in the physical arrangement, such as interior designers, about the arrangement of the equipment of classrooms, and to increase both the awareness and professional knowledge of teachers and administrators in this regard. In addition, dual-shift education, disproportionality between class size and class space, and inappropriateness of classroom equipment to the developmental characteristics of the students should be addressed. Prioritizing the solution of this problem by the Ministry of National Education would make a significant contribution to the effectiveness of teaching and classroom management of teachers. Finally, the classrooms should have areas that would contribute to the academic and social development of the students, rather than being a teaching environment where only desks, tables, and technological devices were placed.

The strengths of this research were that the functions of the classroom environment enabled us to deal with the classroom environment in more detail, and the observation data, together with the interview data provided an opportuniity to handle the topic from a broad perspective. However, there were some limitations in terms of the research design. The interviews were conducted with only twelve elementary teachers, and their classrooms were observed for a total of 36 lessons. Finally, the perception of the students and their parents were disregarded. Future researchers should be interested in this part of the topic.

CONCLUSION

This research has investigated the perception of elementary school teachers on their classrooms in terms of six functions of the classroom and its effects on them and their students. It concluded that most of the teachers were aware of the functions of classroom environment but they disregarded some functions, especially growth, pleasure functions, during their arrangements. Their classrooms were adequately performing the security and shelter function while they were less effective at fulfilling social interaction, symbolic identity, and task instrumentality functions. Also, it could be claimed that they barely fulfilled the pleasure and growth functions. Consistent with these findings, the awareness and arrangements of the teachers related to classroom environment focused on the security and shelter, social and task instrumentality functions, although their desires were about the task instrumentality, growth, and pleasure functions. When the effects of the classroom environment were considered more generally, it was concluded that the elements of the classroom environment were highly related to each other, and to factors of the physical and psychological dimension of the classroom. A favorable property in the classroom environment alleviated problems in other factors as well and left a positive impression on the teacher, the student, and the learning process. The factors that were negative in the physical environment reduced the interaction between the student-teacher and among the students. Moreover, these teachers had difficulties in time management, the instructional techniques were limited, and they tried to cope with unwanted behavior more than the other teachers. Besides its effect on teaching and learning process, it influenced the job satisfaction and fatigue of teachers and the happiness of the students.

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APPENDIX

APPENDIX I PARTICIPANT DIVERSITY

Lackney (2008) underlines that individual and organizational factors cause a lack of environmental competence. For validity and reliability of the findings, participant diversity is given importance because the different characteristics, such as working district, school type, classroom size, grade level, and demographic information of teachers, can be determinative factors in their environmental awareness and environmental competence. A control list was prepared to ensure participant diversity. The first, second, third, and fourth items were related to organizational factors. The last item represented personal factors.The control list was presented in Figure 1.

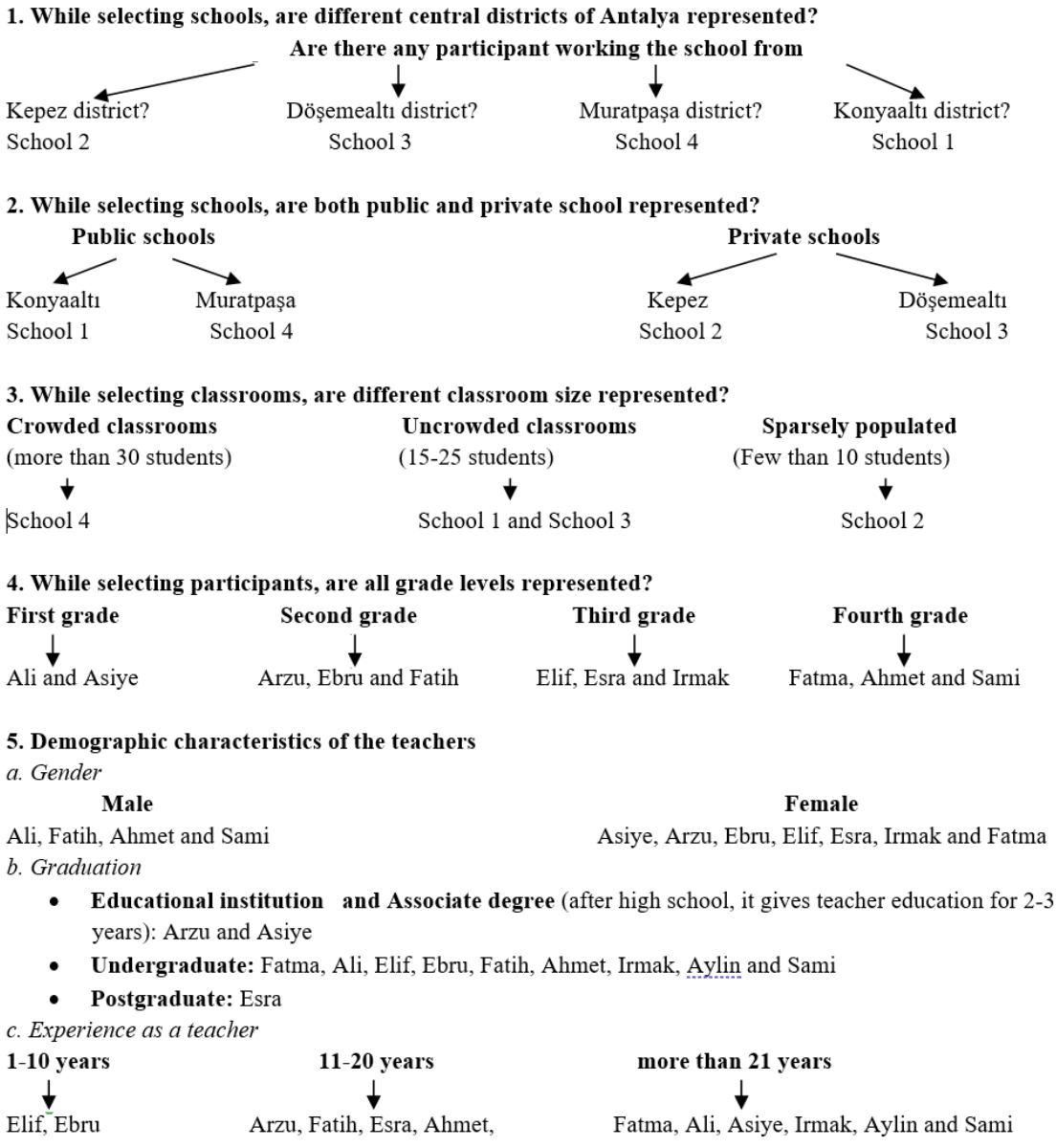

Figure 1: The control list for participant selection process (source: own presentation)

APPENDIX II CALCULATING INTERNAL CONSISTENCY COEFFICIENTS

For the reliability of the findings, internal consistency coefficients can be calculated. There are three steps: (I) two people analyze the data independently; (II) the coding is compared in terms of consistency and gave points; and (III) all points are analyzed (Landis and Koch, 1977). For this study, a specialist different from the researcher coded the research data independently from the researcher, then the researcher compared the coding and gave points. If there is a consistency, both of them took "1" (see Table 8). But if the coding was stated by only one person, the one stated it took "1", the other took "0" (see Table 9). Finally, all points were analyzed through SPSS 20. For instance, A statement related to first question:

"Our class has its own heating and cooling system. We can get the optimum level of heat at any moment. The windows are very well designed, so we can get intense levels of light. The ventilation system works flawlessly. About the seating arrangement, if the children have a physical disability such as vision and auditory, I consider it. I wish I had a class where I could create a different order." (Ahmet).

The expert coded it: Heat and cool condition of the classroom is good.

The researcher coded it: Heat and cool condition of the classroom is optional.

Expert	Researcher
1	1

Table 8:Score table for first coding (source: own presentation)

The expert coded: The teacher didn't state anything about his/her satisfaction about classroom.

The researcher coded: The teacher didn't satisfied with his/her classroom.

Expert	Researcher
1	1
0	1

Table 9:Score table for first and second codings (source: own presentation)