

An Evaluation of Primary School Students' Views about Noise Levels in School*

Nermin BULUNUZ ^{a**}

Mızrap BULUNUZ ^a

Ali Yurdun ORBAK ^a

Nejla MULU ^a

Ömer Faruk TAVŞANLI ^a

^a Uludağ University, Turkey

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Abstract


Effective education and teaching requires keeping classroom noise levels within specific limits. The purpose of this study is to evaluate students' views about the noise level in school, its effects, and control of it at two primary schools (one public school and one private school) located in a district of Bursa - within the scope of the TÜBİTAK 1001 project numbered 114K738. The research sample consists of 432 third and fourth graders, 223 of whom are from the public school and 209 of whom are from the private school. To collect data, a 20-question survey was administered to the students, and noise measurements were carried out in the schools. According to the findings obtained from the analysis of the answers from the student questionnaire, the students think that the noise level is high especially during break times. In parallel with the student views, the average noise level at break time during recess was found to be 74.56 dBA at the private primary school and 82.18 dBA at the public primary school. These values are much higher than the limits prescribed in the Regulation on Assessment and Management of Environmental Noise in Turkey (RAMEN) European Union Harmonization Laws. The research findings show that this important problem must be dealt with urgently, and substantive efforts and activities must be launched to reduce high noise levels in schools.

Keywords: Noise in school, Noise pollution, Student views

Introduction

When the quality of education and teaching in schools is mentioned, what comes to mind first are the physical and technical infrastructure of schools, classroom sizes, quality of teachers, syllabi, and textbooks. Surely, each of these factors is very important. Another factor, equally important but much less frequently noted, is the suitability of the school climate. School climate is defined as the set of elements influencing teachers' and students' attitudes and behaviors (Ari, Tunçer & Demir, 2016; Çelik, 2002). According to Şentürk

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**  Corresponding author: Assoc. Prof. Dr. Nermin Bulunuz, Uludağ University, Faculty of Education, Bursa, Turkey. Phone: +90 (224) 294 22 38, E-mail: nermin.bulunuz@gmail.com

and Sağnak (2012), the school climate is highly associated with the attitudes and behaviors of students and teachers in school because students and teachers develop attitudes and behaviors by breathing in the atmosphere of their school. Noise is one of the main factors having a negative effect on school climate and learning environment (Akman, Ketenoğlu, Evren, Kurt & Düzenli, 2000). Noise refers to sound waves with high energy. Its intensity is measured by decibel meter. Noise pollution is defined as various sounds in the physical space that prevent hearing sounds that are intended to be heard, annoy, distract attention, and negatively affect physiological and psychological health (Ari & Saban, 1999; Polat & Buluş-Kırıkkaya, 2004; Schlittmeier, Hellbrück & Klatte, 2008).

It is school administrators and teachers that play the most important role in creating the school climate. School administrators can improve students' and teachers' motivation, and enhance the productivity of education and teaching by leading the creation of a healthier school climate. A healthy school climate offers a learning environment that supports students' academic, psychological, and behavioral development. In other words, a healthy school climate is a must idiom for students' academic achievement, psychological health, and positive behavior acquisition (Çelik, 2000; Erwin, Fedewa & Ahn, 2013). According to Cohen, Manion, and Morrison (1996), as physical environment provides a frame for learning, it can both improve and prevent learning. Therefore, creation of a quiet, peaceful, calm, and noiseless school climate from preschool to university stands as one of the most important factors determining the quality of education and teaching provided there. According to Varış (1998), a school must have a physical structure that offers an effective communication environment in order to accomplish its goals. Noise is not welcomed in school as it prevents auditory perception by covering sounds (Bilal, 2009). Güney (1998) defines noisy behaviors as signs of disrespect and lack of manners.

The effects of noise on human health fall into four categories: physical effects, physiological effects, psychological effects, and performance effects (Yücel & Altunkasa, 1999). Main physical problem is hearing loss and tinnitus, which emerges as ciliated cells in the inner ear are damaged as a result of exposure to intense noise. In physiological terms, noise increases blood pressure, causes circulatory abnormalities, speeds up breathing, and leads to sudden reflexes. In addition, the experiments carried out on mice show that noise decreases and damps sexual desire (Güney, 1998). Among its psychological effects are unhappiness, nervous breakdown, depression, behavioral disorder, anger, boredom, and loss of attention. For example, students have difficulty in concentrating and learning in excessively noisy classrooms (Güney, 1998). Lastly, noise reduces performance or productivity at work by causing tiredness, weariness, loss of concentration, and sleeplessness (Güney, 1998; Yücel & Altunkasa, 1999). Effective education and teaching require keeping classroom noise level within specific limits. According to Avcı and Gönüllü (2000), any noise level that exceeds determined limits negatively affects the quality of education and teaching by leading to the following adverse consequences:

- Masking of the speech and reduction in perception capability,
- Loss of psychological and physical attention,
- Longer duration of learning by reading,
- Bad temper and less interest in lessons among students,
- Teachers raising their voice due to noise and thus getting tired in a short period of time.

Research conducted in primary and secondary schools in Turkey shows that noise pollution in schools is much higher than the level determined by the Ministry of Environment and Urbanization (Bilal, 2009; Bulunuz, 2014; Çelik, 2002; Özbıçakçı, Çapık, Aydoğdu, Ersin & Kıssal, 2012; Polat & Buluş-Kırıkkaya, 2007; Şentürk & Sağnak 2012;

Tamer, Küçükçifçi & Şan, 2011; Tüzel, 2013; Varış, 1998). According to Regulation on Assessment and Management of Environmental Noise in Turkey (RAMEN) European Union Harmonization Laws, the indoor noise upper limit for classrooms is 35dB with windows closed and 45dB with windows open; it is 40dB for theater halls; and it is 55dB in dining halls (RAMEN, 2008). However, measurements carried out in schools in Turkey indicate that noise levels in schools are much higher than the above-mentioned limits (Bulunuz, 2014; Tamer-Bayazit et al., 2011). For example, Tamer et al. (2011) conducted a study on primary school students and found the level of noise experienced at break times in 84% of the schools to be 76-89 dB. In their research on primary school students, Özbıçakçı et al. (2012) found that the measured noise levels are so high that they can lead to temporary hearing loss among students. Students are exposed to very high noise levels at break times, which undermine the goal of giving the students a rest. There are indeed reserved for students to have a rest. In another study, in-class noise level was found to be 70.8-72.5 dB in primary and secondary schools (Polat & Buluş-Kırıkkaya, 2004).

Tüzel (2013) conducted a study to determine the degree to which in-class noise affects the 5th grade students' skills of understanding and remembering what they listen to and made 146-person sample group listen to two texts, one in a noisy (79 dBA) classroom environment and one in a noiseless classroom environment with sound insulation (36 dBA). He separately administered a test about understanding and recall for each text. He found out that classroom noise had a strong effect on the 5th grade students' levels of understanding and remembering what was listened to and thus reduced their learning performance. In the noiseless environment, in contrast, the students both understood what they listened to better and remembered them at a higher level. In the study aiming to reduce noise pollution in primary schools by providing training, Bulunuz (2014) training did not result in a measurable reduction to the noise pollution level, which was measured to be 80-90 dB at break times in particular, but students' and teachers' awareness and consciousness of noise pollution was raised in the research process.

The international literature on this topic includes many studies that determine identify, measure, and define noise pollution in schools and in the vicinity of schools (Choi & McPherson, 2005; Grebenniko, 2006; İkenbergy, 1974; Shield & Dockrell, 2004:2009), which suggest the design of noise-reducing acoustic structures and use of sound absorbing materials in schools (İkenbergy, 1974), and which investigate noise pollution and its effects on student achievement in schools (Skarlatos & Manatakis, 2003; Shield & Dockrell, 2008; Jewell, 1980). The studies about noise pollution in Turkey, on the other hand, mostly focus on identifying noise pollution in cities and factories and its negative effects on the environment (Kumbur, Özsoy, & Özer, 2003; Uslu & Yücel, 1997). Although schools are among the places where noise pollution is experienced most intensely, ULAKBİM (Ulusal Akademik Ağ ve Bilim Merkezi) database contains very few studies dealing with the size and effects of noise pollution in Turkey (Özbıçakçı & Çapık, 2012; Polat & Buluş-Kırıkkaya, 2007; Tamer-Bayazit, Küçükçifçi & Şan, 2011).

The negative effects of noise pollution have been proved by previous research (Choi & McPherson, 2005; Grebennikov, 2006; İkenbergy, 1974; Shield & Dockrell, 2004:2009). International studies indicate that noise pollution in school has a negative effect on students' learning and academic achievement (Jewell, 1980; Shield & Dockrell, 2008; Skarlatos & Manatakis, 2003). Jewell (1980) conducted a study to determine the effect of noise level on technical vocational high school students' duration time of completing tasks and found that high noise levels increased their duration time of completing tasks. This finding is an important evidence of the harm caused by noise in students' school performance. Additionally, a previous research indicates that in-class noise significantly

reduces performance in learning how to read and write (Berg, Blair, & Benson, 1996; Evans, & Lepore, 1993; Hetu, Truchon-Gagnon, & Bilodeau, 1990; Mackenzie, 2000).

Scopenhauer, a German philosopher, argues that a person's strength to endure noise is inversely correlated with his mental stability (Güney, 1998). Güney (1998) categorizes the sources of noise into two groups: "inevitable noises" and "preventable noises stemming from human behaviors". While noises deriving from construction work and noises deriving from road, airway, and seaway traffic can be considered inevitable noises, the acts of people that do not respect one another in the environments they live in can be considered to be preventable noises stemming from human behaviors. Some examples of preventable noises are speaking loudly in indoor or outdoor environments, shouting, running, listening to loud music, singing loudly, and screaming. As educational level, consciousness, and knowledge level increase, noises stemming from human behaviors decrease (Güney, 1998).

The purpose of this study is to evaluate student views regarding noise level in schools, its effects, and control of it in two schools, one of which is a public school while the other is a private school located in a district of Bursa. Research questions are as follows:

- What are the general views of students regarding noise levels in school?
- What percentages of students are affected by different types of noise coming from inside and outside of the school?
- What are students' views about the control of noise pollution in school?

Method

Sample

The study was conducted in two primary schools, one public school and one private school, with similar socioeconomic levels located in the Nilüfer district of Bursa province. Participants of the study were determined according to convenience sampling. The sample of the study includes 223 students from the public school and 209 students from the private school (i.e. a total of 432 students). The sample consisted of 222 female, and 210 male. They are third and fourth grade students. Their ages ranges between 9-10 years old.

Research Model

Survey modelling, which is a research method, was employed in the study. As is known, survey models are the approaches aiming to define a situation in the past or present as the way it was/is (Karasar, 1998). The responses given to the questionnaire by the primary school students via survey method provided an insight to detect their current opinions regarding noise levels in their schools.

Data Collection Tools

Two types of quantitative data were collected to analyze noise pollution level in the schools. The first type of data was obtained through the student questionnaire including 20 questions developed within the scope of the project regarding noise levels in schools, the reasons for it, and how to control it. Fourteen questions in the student questionnaire are in the form of a 5 point Likert scale. The rest of the questions are in the form of multiple choice questions. The second type of data was obtained through measurement of noise in decibels via noise measurement devices (decibel meters) purchased within the scope of the project.

Data Analysis

Descriptive statistics were used to describe the findings from the student questionnaire. Analysis results are presented via graphs and tables by comparing frequencies and

percentage values. The data collected via the noise measurement device (decibel meter) were analyzed via “Noise at Work” software purchased within the scope of project. Noise data collected from various spots of two schools are presented in decibels. More than one data collection tools were used in the study to promote the validity of measurement by using triangulation method (Cresswell, 2003). The data collection tools were the questionnaire about students' opinions about the noise level of their school and the measurements of actual noise level of the school determined by the decibel meter.

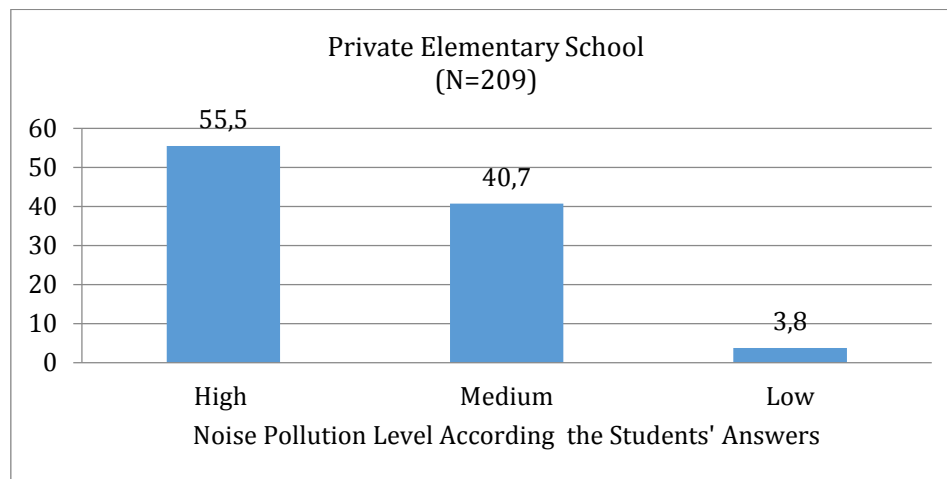
Findings

Findings Regarding the First Research Question

The first research question of the study is “What are the general views of students regarding the noise level in school?”. The findings obtained from two data collection tools to answer this question are given below:

1a. Findings Obtained from the Student Questionnaire

The responses given by the public school and private school students to the student questionnaire were analyzed separately. Graph 1 below shows the views of third and fourth grade students regarding noise levels in the private school:

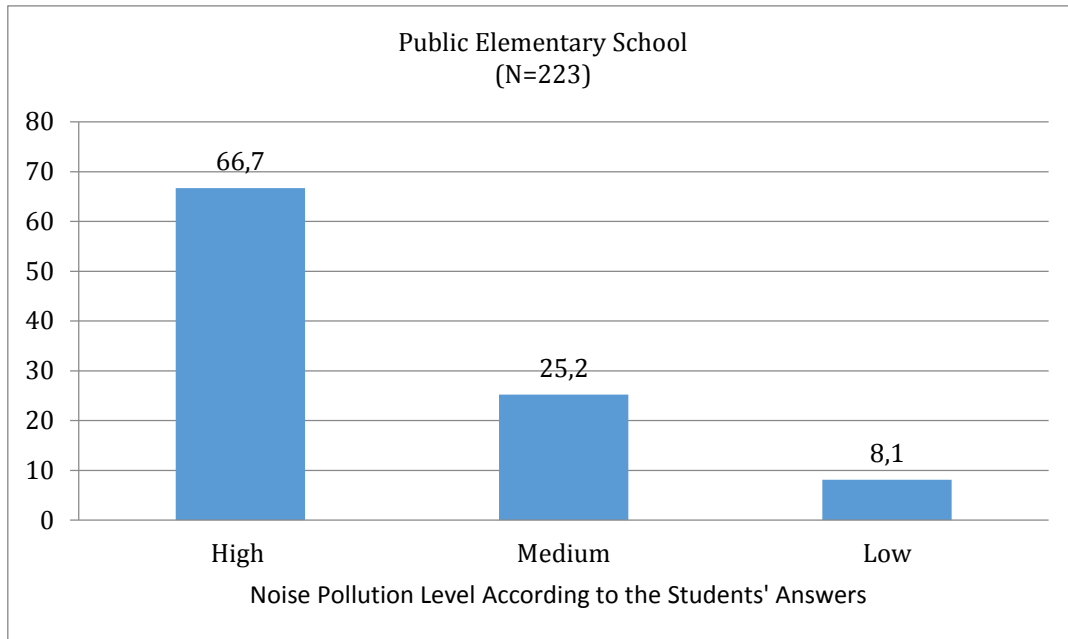


Graph 1. *The Private Elementary School Students' Views Regarding the Noise Level in School*

According to the results presented in Graph 1 above showing findings obtained from 108 3rd grade and 101 4th grade students (i.e. a total of 209), approximately 97% of the primary school students think that there is noise pollution in their schools. In response to the question “What do you think is the level of noise - in your school?”, 55.5% of the students stated noise to be high, while 40.7% stated it to be medium, and 3.8% stated it to be “low”.

The private elementary school students were asked not only about general noise levels but also specifically about noise levels during lessons and break times. The private school students considered the noise level during lessons to be high at a percentage of 29.3%, medium at a percentage of 39.5%, and low at a percentage of 25.9%. The students think that the noise level during break times is high at a percentage of 81.2%, medium at a percentage of 16.9%, and low at a percentage of 2%.

Graph 2 below shows findings obtained from the public school students' views regarding noise levels in their school:



Graph 2. Public Elementary School Students' Views Regarding Noise Level in Their School

The responses given by the public primary school students, 25 of whom are third grade and 198 of whom are fourth grade (a total of 223), show that 66.7% of the students think noise level in their school is high, 25.2% think it is medium, and 8.1% think it is low.

The public elementary school 3rd and 4th grade students were asked not only about general noise level but also noise level during lessons and break times. 37.4% think that noise level during lessons is high while 39.6% think it is medium and 23% think it is low. The students' views regarding noise level during break times are as follows: 83.6% think it is high; 12.8% think it is medium; and 3.6% think it is low.

1b. The Findings Obtained from the Noise Measurement Device (Decibel Meter)

Separate measurements were made during the lessons, break times, in classrooms, halls, and outdoor play areas of private and public primary schools. The values that appeared on the measurement device were carefully recorded. Table 1 and 2 show values obtained from the noise measurement device in decibels (dB) recorded in classrooms, halls, and outdoor play areas of private and public primary schools during lessons and break times:

Table 1. Noise Measurement Values During the Lessons (dB)

	Inside the classroom	Halls	Outdoor Play Areas
Private Primary School	65.80	56.80	61.50
Public Primary School	66.66	58.30	61.79

The average noise levels that are shown in the Table 1 were recorded in winter months, that is, when the windows were closed. According to the regulation of the Ministry of Environment and Urbanization, the background noise level when the windows are closed is normally 35 dB. Maximum noise level that is allowed for such places is 60 dB. As known,

an increase of 10 dB means double the noise. In this sense, the findings show that noise levels in the schools are twice as high as the normal level.

Table 2. *Noise Measurement Values during the Break Times (dB)*

	Inside the classroom	Halls	Outdoor Play Areas
Private Primary School	82.32	81.35	68.44
Public Primary School	80.54	82.67	76.04

The values shown in Table 2 indicate that noise levels in both schools during the break times are far above the specified levels. The hall noise average of the schools during break times is around 80 dB. This value corresponds to the range of 60-90 dB, which is excessively annoying.

Findings Regarding the Second Research Question

The second research question is “What percentage of students are affected by different types of noise coming from inside and outside of the school?”. The reasons for noise in schools were divided into two: inside of the school and outside of the school. The reasons for internal noise are: 1) the noises resulting from the students shouting, screaming, singing inside the classrooms or halls; 2) the noises resulting from the students’ physical behaviors such as pulling the desks, banging the doors, and running; and 3) the noises resulting from possessions and devices such as lighting devices, electrical hard-surface cleaning machines, ringing, and announcements. The noises coming from outside of the school include: 1) car and traffic noises such as horns; 2) noises resulting from nearby construction sites; and 3) industrial and commercial facility noise stemming from factories, shopping places, entertainment places, and bazaars. Table 3 shows the findings obtained from the private primary school students’ responses to this question.

Table 3. *The Private Primary School Students’ Views Regarding Noise Levels in Their School*

Private Primary School		It does not annoy me.	It annoys me a bit.	It is moderately annoying me.	It annoys me.	It annoys me very much.
NOISE SOURCES INSIDE OF THE SCHOOL	Students’ voices (e.g. shouting)	29 13.9%	36 17.2%	42 20.1%	50 23.9%	52 24.9%
	Physical movements (e.g. banging the door, pulling the desks)	22 10.6%	46 22.1%	39 18.8%	58 27.9%	43 20.7%
	Devices (ringing and announcement)	129 54.5%	53 25.4%	15 7.2%	6 2.9%	6 2.9%
	TOTAL					

Table 3. Cont.

	Traffic noise	62	60	27	32	28
		29.7%	28.7%	12.9%	15.3%	13.4%
	Noise of constructions, etc.	62	52	51	15	27
		30%	25.1%	24.6%	7.2%	13.0%
NOISE SOURCES OUTSIDE OF THE SCHOOL						
	Noise of industrial facilities, etc.	107	41	33	13	14
		51.4%	19.7%	15.9%	6.3%	6.7%
TOTAL						

The findings obtained from the private primary school students' responses show that 1) 24.9% of the students (52) are "annoyed very much" due to students' voices (e.g. screaming) while 23.92% (50) are "annoyed"; 2) 27.9% (58) are "annoyed" due to the noises resulting from physical movements (e.g. banging the doors, pulling the desks) while 22.1% (46) stated that they are "annoyed a bit"; 3) 54.4% (129) of students are "not annoyed" by ringing and announcements while 25.4% (53) are "annoyed a bit". In addition, 29.7% (62) of the students are "not annoyed" by traffic noises, which is one of the noise sources outside of the school, while 28.7% (60) are "annoyed a bit"; 30% (62) are "not annoyed" by the construction noises in the surrounding area; however, 25.1% (52) are "annoyed a bit"; 51.4% (107) are "not annoyed" by the noise coming from industrial facilities and so on while 19.7% (41) are "annoyed a bit".

The findings obtained from the public primary school students' responses regarding the second research question are given in Table 4.

Table 4. The Public Primary School Students' Views Regarding Noise Levels in Schools

Public Primary School		It does not annoy me.	It annoys me a bit.	It is moderately annoying me.	It annoys me.	It annoys me very much.
NOISE SOURCES INSIDE OF THE SCHOOL	Students' voices (e.g. shouting.)	32 14.6%	22 10.0%	31 14.2%	43 19.6%	91 41.6%
	Physical movements (e.g. banging the door, pulling the desks)	31 14.0%	31 14.0%	34 15.3%	50 22.5%	76 34.2%
	Devices (ringing and announcement)	101 45.7%	44 19.9%	31 14%	18 8.1%	27 12.2%

Table 4. Cont.

NOISE SOURCES OUTSIDE OF THE SCHOOL	Traffic noise	51	46	35	38	52
		23%	20.7%	15.8%	17.1%	23.4%
	Noise of construction, etc.	60	37	30	38	55
		27.3%	16.8%	13.6%	17.3%	25%
NOISES OF INDUSTRIAL FACILITIES, ETC.	Noises of industrial facilities, etc.	107	31	28	27	29
		48.2%	14%	12.6%	12.2%	13.1%
TOTAL						

The students participating in the project from the public primary school are “annoyed very much” at the rate of 41.6% (91) by the students shouting and screaming inside the school while 19.6% (43) are “annoyed”. 34.2% (76) of the students are “annoyed very much” due to noise resulting from physical movements (e.g. banging the door, pulling the desks) while 22.5% (50) are “annoyed”. 45.7% (101) of the students are “not annoyed” due to ringing and announcements while 19.9% (44) are “annoyed a bit”. 23.4% (52) of the students are “annoyed very much” due to traffic noise, which is one of the noise sources outside of the school, while 23% (51) are “not annoyed”. 27.3% of the students are “not annoyed” due to the noise coming from the surrounding construction works while 25% are “annoyed very much”. In addition, 48.2% of the students are “not annoyed” due to the noise coming from industrial facility while 14% (31) are “annoyed a bit”.

Findings Regarding the Third Research Question

The third research question was “What are students’ views about the control of noise pollution in school?”. Table 5 below compares private primary school and public primary school students’ views regarding being affected by sources of noise:

Table 5. Students’ Views regarding Being Affected by Sources of Noise

Items	Options	Private Primary School		Public Primary School	
		<i>f</i>	%	<i>f</i>	%
How well can you hear your friends at break times?	I do not hear at all	2	1	4	1.8
	I have difficulty in hearing	40	19.1	50	22.4
	I hear normally	85	40.7	68	30.5
	I hear well	26	12.4	40	17.9
	I hear very well	56	26.8	61	27.4

Table 5. Cont.

What do you feel about noise level at break times?	I am very annoyed	35	16.8	63	28.4
	I am annoyed	92	44.2	79	35.6
	I find it normal	60	28.8	52	23.4
	I am comfortable	15	7.2	18	8.1
	I am very comfortable	6	2.9	10	4.5
How well can you hear your teacher during lessons in general?	I do not hear at all	0	0	3	1.3
	I have difficulty in hearing	8	3.9	18	8.1
	I hear normally	47	22.8	56	25.1
	I hear well	42	20.4	40	17.9
	I hear very well	109	52.9	106	47.5
What do you feel about noise during lessons?	It does not annoy me at all.	7	3.3	14	6.3
	It does not annoy me.	17	8.2	12	5.4
	Normal	68	32.9	56	25.3
	It annoys me.	78	37.7	82	37.1
	It annoys me a lot.	37	17.9	57	25.8

In response to the question “How well can you hear your friends at break times?”, 40.7% (85) of the students attending the private primary school and 30.5% (68) of the students attending the public school stated that they can hear their friends “normally”.

In response to the question “What do you feel about the noise level at break times?”, 44.2% (92) of the students attending the private primary school and 35.6% (79) of the students attending the public school stated that they are annoyed by the noise.

In response to the question “How well can you hear your teacher during lessons in general?”, 52.9% (109) of the students attending the private primary school and 47.5% (106) of the students attending the public school stated that they can hear their teachers very well.

In response to the question “What do you feel about noise during lessons?”, 37.7% (78) of the students attending the private primary school and 37.1% (82) of the students attending the public school stated that they are annoyed by the noise during lessons.

Table 6 below compares project participant private primary school and public primary school students’ views regarding the control of noise pollution in school:

Table 6. *Students' Views Regarding the Control of Noise Pollution in School*

Items	Options	Private School	Public	Public Primary School	
		<i>f</i>	%	<i>f</i>	%
What kind of a relationship do you think there is between the noise you are exposed to at school and your achievement in lessons?	There is no relationship at all	32	15.5	25	11.2
	It is unrelated	27	13.1	25	11.2
	It is somewhat related	72	35	43	19.3
	It is related	43	20.9	45	20.2
	It is very related	32	15.5	85	38.1
How often do you warn your friends when you see them displaying noisy behaviors in the school building such as running and speaking loudly?	I never warn	16	7.7	24	10.8
	I rarely warn	35	16.8	35	15.7
	I sometimes warn	102	49.0	83	37.2
	I often warn	40	19.2	45	20.2
	I always warn	15	7.2	36	16.1
How often do your teachers warn you when they see you displaying noisy behaviors in the school building?	They never warn	15	7.3	19	8.6
	They rarely warn	27	13.1	15	6.8
	They sometimes warn	37	18.0	37	16.7
	They always warn	52	25.2	90	40.7
Do you believe that noise level in school can be reduced?	I do not believe by any means	22	10.5	35	15.7
	I do not believe	22	10.5	32	14.3
	I am neutral	84	40.2	91	40.8
	I believe	47	22.5	40	17.9
	I definitely believe	34	16.3	25	11.2

In response to the question “What kind of a relationship do you think there is between the noise you are exposed to at school and your achievement in lessons?”, 35% (72) of the students attending the private primary school think that the noise they are exposed to at school is somewhat related to their achievement in lessons while 38.1% (85) of the students attending the private primary school think that the noise they are exposed to at school is very related to their achievement in lessons. In response to the question “How often do you warn your friends when you see them displaying noisy behaviors in the

school building such as running and speaking loudly?”, 49% (102) of the students attending the private primary school and 37.2% (83) of the students attending the public primary school stated that they “sometimes warn”.

In response to the question “How often do your teachers warn you when they see you displaying noisy behaviors in the school building?”, 36.4% (75) of the students attending the private primary school stated that their teachers warn them “often” while 40.7% (90) of the students attending the public primary school stated that their teachers warn them “always”. Lastly, in response to the question “Do you believe that noise level in school can be reduced?”, 40.2% (84) of the students attending the private primary school and 40.8% (91) of the students attending the public primary school stated that they are neutral about the reduction of noise in their school.

Results

Results Related to the First Research Question

The first research question of the study is “What are the general views of students regarding noise level in school?”. Student responses regarding the relevant question from the questionnaire were descriptively analyzed in order to answer this question. Analysis results show that a great majority of students studying in private and public primary schools think that general noise levels in the schools are “high” during the break times. The comparison of responses given by the students from both primary schools indicate that 55.5% of the private school students and 66.7% of the public school students think that noise levels in the schools are “high”. Consequently, the noise is “high during the break times” according to primary school students participated in the study. Noise measurement values obtained from private and public schools show that the private school and the public school have equal levels of noise excluding field measurements that depend on their physical conditions and locations (e.g. streets).

Students think that noise levels during the break times are much higher compared to the noise level during the classes. Indeed, break times are the periods to let students have a rest after an intense 40 minutes of class. However, they are the periods during which the noise level is the highest. Higher values during the break times than the values recorded during the classes are quite natural. However, the resulting noise annoys the students and the teachers in the environment. In addition, it may be negatively influencing their ear health. Noise level in the halls particularly during the break times does not allow students and teachers to have a rest. On the contrary, it is a level that leads them to be more tired.

Comparison of audial check spelling on audial environments (acoustic comfort) of the schools where the research took place show that all the classrooms of the private school have “suspended ceilings” with high levels of sound absorption whereas the halls do not have suspended ceilings. In addition, the grounds of the private school classrooms are covered with “linoleum” to yield less sound when desks are pulled, students run, or hit. On the other hand, the classrooms of public school are not equipped with suspended ceilings and linoleum flooring. If the ceiling, ground and walls of a school are not covered with sound absorbing materials, the sound goes backwards and forwards just like a bouncing ball in the environment leading resonance to be rather disturbing and deteriorating our health. Though the audial environment of the private school is better than the public school, students studying at the private school also think that noise level in their school is “high”. The responses given by the private school students show that covering only classroom ceilings and grounds with sound absorbing materials are not sufficient to reduce the noise.

The awareness of students and teachers that they were being measured also may have influenced behavior. For instance, one teacher was heard to remind: "My boy, please be quiet, they are measuring the noise!". Therefore it may be that the measured values are a bit lower than the natural environment of the classrooms. In spite of this fact, the measured values were higher than the maximum values. The noise level range is between 45 to 50 dB when the students are in classrooms. The school halls have a noise of 55 dB or over when the students are in the classrooms and the doors are closed. This can be explained by poor acoustic design of the classrooms and the halls, high levels of speaking in the classrooms by students as well as the teachers, or common noisy behaviors of the students during the classes. The noise level measured in the field of the school when the students were in the classrooms is high and over the 55 dB specified in the regulation. This is associated with the noise stemming from traffic of the nearby housing complexes or apartment buildings and the noisy location of the school. The obtained results are in line with the results of previous studies indicating that noise levels in the schools of Turkey are high (Bulunuz, 2014; Özbıçakçı & Çapık, 2012; Polat & Buluş-Kırıkkaya, 2007; Tamer-Bayazıt, Küçükçiftçi & Şan, 2011).

Results Related to the Second Research Question

The second research question is "What percentages of students are affected by different types of noise coming from inside and outside of the school?". The responses given by the students attending the private and public school show that 52% of the private school students are "annoyed very much" due to students' shouting whereas 58% of the students are "annoyed" due to the noise resulting from physical movements such as banging the doors, pulling the desks and so on. However, the same group stated that they are "not annoyed" by the noise resulting from the devices (announcements, ringing), traffic, nearby construction, and industrial facilities. These results are were highly consistent with the responses given by the public school students. Similarly, public school students are annoyed by the extreme "noise" resulting from human voices and movements. However, students do not perceive other sound sources as "noise" and do not feel annoyed. The results obtained from these findings indicate that students are particularly annoyed due to the noise resulting from students' random shouting, calling, or screaming especially during the break times within the school building. On the other hand, students of both schools seem to have accepted the noise created by the noise sources outside the school and emphasize that they do not feel annoyed. It is obvious that the participants are not aware what is called "noise" and what is not.

Results Obtained from the Third Research Question

The third research question was "What are students' views about the control of noise pollution in school?". In response to the question "What kind of a relationship do you think there is between the noise you are exposed to at school and your achievement in your lessons?", 35% (72) of the students attending the private primary school and 38.1% (85) of the students attending the private primary school think that the noise they are exposed to at school is very related to their achievement in lessons. This implies that the students do not have enough knowledge of how the level of noise they are exposed to in school negatively affects their achievement in their lessons. The students' answers show that they are not aware of the physical and psychological dangers of noise and how it threatens their health.

How do they respond to noise? Do they warn their friends against making noise? In this matter, 49% of the students attending the private primary school and 37.2% of the students attending the public primary school stated that they "sometimes warn" their friends. What about the way teachers respond to students making noise? On this issue,

36.4% of the students attending the private public school stated that their teachers warn them "often" while 40.7% (90) of the students attending the public primary school stated that their teachers warn them "always". In other words, less than half of the students of both schools stated that they were warned them by their teachers. This implies that teachers do not have a decisive and strict attitude towards students displaying e generating behaviors and do not warn students. Lastly, students from both schools (40.2% and 40.8%) reported neutral feelings about the reduction of noise in their schools. It seems that it will take many years for students to have the following perspective: "Yes, if we are sufficiently educated - and if we -comply with rules to curb noise in our school, noise in our school can be reduced".

Recommendations

Based on the research results, the following recommendations can be put forward:

1. The way of eliminating the source of noise is to teach students how to behave as of the first day they take a step into the school building for nursery class or primary school first grade. School administrators, teachers, and students should be informed that student behaviors should be well-disciplined in school buildings with heavy use.
2. Meetings should be conducted with school administrators for the elimination of announcements through loudspeakers and loud ring bells in the school building. Schools where no-bell school projects are carried out and effective results are obtained should be shown as examples. Alternative practices that regulate student and teacher entrance and exit through light systems similar to traffic lights, which are in use in some countries, rather than bells should be introduced to school administrators and teachers.
3. School administrators should be informed of possible OR available acoustic improvements. They should be informed that indoor noise level is mostly reduced through sound-absorbing materials for example porous absorbents can be used in surfaces as a covering.



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