COGNITIVE PERCEPTIONS OF SCIENCE TEACHER'S CANDIDATES REGARDING NOISE POLLUTION[*]

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Abstract

The aim of this research is to reveal the cognitive perceptions of the science teacher candidates participating in the research about the concept of "noise pollution", which is taught within the scope of the environmental education course Totally 60 third and fourth grade students, who study the department of Science Education Teaching in Hatay Mustafa Kemal University in 2021-2022 Academic Year participated in this research. In this research, phenomenology design, one of the qualitative research methods, was used. Controlled word association test and drawing technique were used together as data collection tool to determine the cognitive perceptions of science teacher candidates. In the light of the findings obtained from the research, it was seen that science teacher candidates produced more concepts about noise sources and their effects on human health, but they did not dwell much on the issue of reducing or preventing noise pollution. Only two science teacher candidates gave the answer "sound insulation" and showed this answer in the drawing they drew. The drawings made by the science teacher candidates and the data obtained from the word association test overlap with each other. However, it was observed that the science teacher candidates' sensitivity to this environmental problem was insufficient.

Keywords: Noise Pollution, Science Teacher Candidates, Phenomenology, Drawing, Controlled Word Association Test

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FEN BİLGİSİ ÖĞRETMEN ADAYLARININ GÜRÜLTÜ KİRLİLİĞİNE İLİŞKİN BİLİŞSEL ALGILARI

Özet

Bu çalışmanın amacı, araştırmaya katılan fen bilgisi öğretmen adaylarının çevre eğitimi dersi kapsamında işlenen "gürültü kirliliği" kavramına ilişkin bilişsel algılarını ortaya çıkarmaktır. Araştırmaya 2021-2022 Eğitim Öğretim yılında Hatay Mustafa Kemal Üniversitesi Fen Bilimleri Öğretmenliği bölümünde öğrenim gören toplam 60 üçüncü ve dördüncü sınıf öğrencisi katılmıştır. Bu çalışmada, nitel araştırma yöntemlerinden fenomenoloji deseni kullanılmıştır. Öğretmen adaylarının bilişsel algılarını belirlemek için veri toplama aracı olarak kontrollü kelime ilişkilendirme testi ile çizim tekniği bir arada kullanılmıştır. Araştırmadan elde edilen bulgular ışığında fen bilgisi öğretmen adaylarının gürültü kaynaklarına ve insan sağlığına etkilerine yönelik daha çok kavram ürettikleri ancak gürültü kirliliğinin azaltılması ya da önlenmesi konusu üzerinde ise pek fazla durmadıkları görülmüştür. Yalnızca iki öğretmen adayı "ses yalıtımı" yanıtını vermiş ve bu yanıtı çizdiği çizimde de göstermiştir. Öğretmen adaylarının yapmış oldukları çizimler ile kelime ilişkilendirme testinden elde edilen veriler birbirleriyle örtüşmektedir. Ancak öğretmen adaylarının bu çevre sorunu karşısında duyarlılıklarının zayıf olduğu görülmüştür.

Anahtar Kelimeler: Gürültü Kirliliği, Fen Bilgisi Öğretmen Adayları, Fenomenoloji, Çizim, Kontrollü Kelime İlişkilendirme Testi

Introduction

With the industrial revolution, industrialization and technological developments have increased, natural resources have been unconsciously consumed and various environmental problems have entered human life. Environmental problems have become a global problem that needs to be solved because they not only affect people but also threaten the life of all living things (Kurt Konakoğlu, 2020). When it comes to environmental problems, the first problems that come to mind are rapid population growth, global climate change, decrease in biodiversity, erosion, depletion of the ozone layer, pesticides and environmental pollution. Noise pollution, which is one of the environmental pollutions, can negatively affect living things physiologically and psychologically (Çokadar, Türkoğlu, & Gezer, 2015; Öner; 2022).

Sound has a valuable place in human life. We communicate through sounds. Babies tell their troubles through the sounds they make in the face of the difficulties they face. While we can be happy with the beautiful sounds we hear, we can also feel uneasy with the disturbing sounds. All sounds that are disturbing, undesirable or that can cause health problems are also called noise (Önder, 2016). The rapidly increasing world population and the increasing consumption need in parallel has brought industrialization. All living organisms living in and around settlements, including many big city centers, especially industrial societies, are exposed to noise pollution, which is one of the environmental problems.

The concept of noise was first recognized as an important pollution factor at the World Environment Congress held in Stockholm in 1972 (United Nations, 1973). In the following years, the

World Health Organization reported many studies showing the negative effects of noise pollution on human health (WHO, 1983, 1999, 2004, 2009 & 2011). In addition, acoustic pollution has been accepted by the World Health Organization in 2011 as one of the most important environmental stress factors that negatively affect public health (WHO, 2011).

Noise is an environmental problem that reduces working efficiency, negatively affects the quality of life and can even lead to various physiological and psychological problems. Sound intensity causing noise is measured in dB (decibel) units (Encyclopedic environmental dictionary, 2001: 168). Sounds that are too low to be heard are 0 dB, and sounds that are loud enough to disturb the human ear are 120 dB (Sevinç, 2015: 104). The sound levels and loudness of various sound sources are shown in Table 1.

Table 1. Examples of Various Volume Levels (https://shoptr4.griese.org/content?c=ses%20desibel%20seviyeleri&id=2)

Examples	Decibel Sound pressure level (dBSPL)	Sound intensity
Jet plane, 50 m away, Hunting rifle	140	100
Pain threshold, Drilling hammer	130	10
Discomfort threshold, Airplane taking off	120	1
Saw, 1 m away	110	0.1
Disco, 1m away from speakers, Heavy traffic	100	0.01
Diesel truck, 10 m away, Shaver, Lawn mower	90	0.001
Subway, Factory noise	80	0.0001
Vacuum cleaner, 1 m away	70	0.00001
Chat, 1 m	60	0.000001
Average house	50	0.0000001
Quiet library	40	0.00000001
Quiet bedroom at night	30	0.000000001
TV studio background, Speaking in a whisper	20	0.0000000001
Rustling of leaves	10	0.00000000001
Hearing threshold	0	0.000000000001

Exposure to noise can cause auditory or non-auditory effects on health. Noise can cause auditory effects such as hearing loss and tinnitus, and it causes many negative effects on human health when exposed to noise for a long time. These effects lead to psychological and physiological distress and even deterioration of homeostasis (Basner et al., 2014). In parallel with the increase in noise levels, the quality of life tends to decrease (Akan et al., 2012). For this reason, noise has ceased to be a low-value pollutant with which we have to learn to live with it, and has become an important issue for different government and public spaces in Europe (Morillas et al., 2018).

Akturk et al. (2003) report that most of the noise pollution in settlements is due to road activities. One of the important factors that increase noise pollution in our country is that residential and office areas are generally located in areas with heavy traffic (Çerçevik et al., 2018). In order to determine traffic noise pollution in various countries, Brown (1994), Georgiadou et al. (2004), Onuu

(2000), Salomons & Pont (2012), Tang & Wang (2007). In addition, have also researchers conducted studies on the assessment of noise pollution in many countries (Hunashal & Patil, 2012; Özyonar & Pekel, 2008; Vidya Sagar & Nageshwara, 2006; Zannin et al., 2001; Zannin et al., 2002).

When the studies in the literature are examined, it is seen that noise pollution is among the environmental problems that are given the least importance by both teachers and students (Artun, Uzunöz, & Akbaş, 2013; Demirbaş & Bektaş, 2009; Kalaycı, 2020 ; Oğuz, Çakcı Kavas; 2011; Özgen & Kahyaoğlu, 2011; Sadık, 2014; Sadık, Çakan, & Artut, 2011; Seçgin, Yalvaç & Çetin, 2010; Şeyihoğlu, Sever & Özmen, 2018). This situation shows that especially in Turkey, noise pollution is not given much importance and there is an insufficient perception in this regard.

In this research, it was tried to determine the cognitive perceptions of the science teacher candidates about noise pollution. The number and quality of words associated with a concept can give information about whether the concept of interest is understood correctly (Eren, 2012). In addition, when it comes to providing students with a permanent and meaningful learning experience, raising awareness about environmental problems, and improving the knowledge dimension of environmental literacy, we need to consider their cognitive structures regarding environmental issues and concepts in teaching (Taşbaş et al. al. 2020). It is thought that the research can contribute to the training of more sensitive individuals by raising awareness about noise pollution in the science teacher candidates.

Method

Research Design

In this research, the qualitative research method, which is used to find answers to questions about the experiences of individuals in the face of a certain event or phenomenon, was used (Punch, 2005). Qualitative research; tries to determine how events, experiences and actions are interpreted (Tanyaş, 2014). Phenomenology design was preferred as the design. Phenomenology helps us understand phenomena that are close to us but that we cannot fully grasp. These phenomena can be in the form of concepts, perceptions, events or experiences we encounter in our lives (Yıldırım & Şimşek, 2016). Qualitative research method was preferred in this study to determine how the science teacher candidates cognitively understand the concept of noise pollution.

Research Group

This research was consisted of 60 3rd and 4th grade science teacher candidates studying in Hatay Mustafa Kemal University, Faculty of Education in the 1nd term of the 2021-2022 academic years. Of the science teacher candidates participating in the research, 29 (22 girls-7 boys) took the environmental education course in the 3rd grade, and 31 (27 girls-4 boys) took the environmental education course in the 4th grade. The targeted universe is selected from individuals who will help to

reach the desired detailed information about the concept to be researched. In qualitative research, it is necessary to determine samples that will enable us to reach detailed data suitable for the purpose of the research instead of large-scale groups (Coyne, 1997). In the research, criterion sampling, which is one of the non-probabilistic sampling methods, was preferred in order to provide more qualified and rich data. A variable such as any situation or time in the research can be selected as a criterion (Grix, 2010) or a pre-created criterion list by researchers can be used (Marshall & Rossman, 2014). In this study, it was determined that science teacher candidates took the environmental education course and voluntarily filled out the data forms.

Data Collection Tools and Process

A data form consisting of two parts was used as a data collection tool. The first part of the data form consists of a controlled word association test. Word association test is one of the methods used to reveal individuals' cognitive perceptions (Bahar & Özatlı, 2003). As a result of the analysis of the responses given to a stimulus word with word association tests, predictions can be made about that concept (Ustaoğlu & Aytaç, 2014; 217). In this study, controlled word association test was applied. For this test, they were asked to write the first words that came to their minds for the concept of noise pollution, which were written 10 times under each other, and the science teacher candidates were given 1 minute for this (Tsai & Huang, 2002). The main purpose of the time limit is for science teacher candidates to decide on the most important words about noise pollution and write them down.

In the second part of the data form, science teacher candidates were asked to draw a picture about noise pollution and write the main idea they wanted to give in the picture they made.

Data Analysis

Before starting the analysis process, the data forms collected from the science teacher candidates were numbered from 1 to 60. Grade level and gender were not taken into account while coding. The data obtained from the word association test were recorded and their frequencies were determined. Content analysis method was used for word association test and evaluation of drawings. The essence of this approach is to categorize what is said or written and to determine how often they are expressed (Simon & Burstein, 1985; 193). Content analysis aims to explain the relationship between the collected data. For this purpose, the data is organized and divided into certain themes (Yıldırım & Şimşek, 2016). Conceptualized data and themes enable us to better understand the phenomena and associate related concepts with other concepts (Strauss & Corbin, 1990: 62; Yıldırım & Şimşek, 2016: 242). In addition, the codes in the word association test were visualized as a word cloud using the WordArt program.

In order for qualitative research to be more acceptable and credible, attention should be paid to its validity and reliability. Variation, peer confirmation, etc., to ensure validity about the investigated phenomenon. It is useful to use additional methods such as (Yıldırım & Şimşek, 2016: 269). Both word association and drawing techniques were used together to provide a better understanding of science teacher candidates' perceptions. In addition, quotations from the statements of the science teacher candidates are given. The data obtained to reliability were analysed separately by the researcher and a science educator. Common codes and themes were determined, and consensus was reached by discussing the codes with disagreement. The reliability value suggested by Miles and Huberman (1994) was calculated as 87%. Considering that it is recommended that the percentage of agreement between coders be at least 80%, it was accepted that the reliability of the research was provided (Patton, 2002).

Findings

In this part, the findings obtained from the pictures drawn by the science teacher candidates with the controlled word association test were categorized by dividing them into themes. The answers given for the key concept were divided into the themes and the codes were listed under the relevant themes. In addition, frequency and percentage values are also calculated and given in the table. A total of 6 themes were created from the controlled word association test and 4 themes were also created from the pictures for the cognitive structures related to the concept of noise pollution from the science teacher candidates who participated in the research. Words repeated once were not combined with other words and were not included in the coding. These words are mentioned in the theme they are seen as related. A total of 600 responses were obtained, of which 595 (99.17%) were coded and tabulated into themes.

A word cloud image was created by calculating the frequency values of the answers given by the science teacher candidates (Figure 1).

Figure 1. The Word Cloud on Noise Pollution

When the word cloud was examined, it was seen that the science teacher candidates gave more space to the concepts of "Horn/siren", "Traffic", "Loud voice/shouting" and "Music".

The themes, codes, frequency and percentage values created regarding the answers given by the science teacher candidates to the controlled word association test are given in Table 2.

Table 2. Frequency and Percentage Values of Codes Created according to Cognitive Perceptions of Noise Pollution

Themes	Codes	Total frequency	%
External sources of noise pollution	Horn/siren (36) Traffic (27) Construction equipment (22) Airplane (19) Car (18) Construction (18) Motorcycle (8) Transportation sound (8) Animals (7) Chainsaw (6) Gunshot (6) Ambulance (6) Helicopter (5) Train (5) Truck (3) Explosion (3) Road work (3) Dynamite (2) Exhaust (2) Thunder (2) Fire engine (2)	208	34.84
Indoor sources of noise pollution	Loud voice/shouting (27) Music (26) Speaker/sound system (24) Human (22) Fight/arguing (15) Vacuum cleaner (12) Crowded (11) Scream (8) Home appliances (8) Baby crying (6) Alarm (5) Phone (5) Washing machine (4) Doorbell (4) Television (4) Mouth smacking (3) Child (3) Fan (3) Blow dryer (3) Hood (3) Rustle (3) Drill (3) Unnecessary talk (2)	206	34.51

	Hum (2)		
The effect of noise on human health	Stress (16) Discomfort (13) Headache (11) Irritability (6) Fatigue (5) Distraction(4) Psychological problems (3) Deafness (3) Insomnia (3) Depression (2)	66	11.05
Noise pollution and sound	Sound(21) Decibel (12) Noise (8) Frequency (7) Intensity (6) High wavelength (4)	58	9.72
Areas with noise pollution	Entertainments venues (10) Factory(10) Big city/metropolis (8) Concert (6) Shopping malls (5) Wedding halls (5) School (5) Match (4) Airport (3)	56	9.38
Prevention of noise pollution	Sound insulation (3)	3	0.5

As can be seen in Table 2, the codes obtained from the answers given by the science teacher candidates are grouped under 6 themes. These themes are "External sources of noise pollution", "Indoor sources of noise pollution", "The effect of noise on human health", "Noise pollution and sound", "Areas with noise pollution" and "Prevention of noise pollution" and the findings related to these themes are below.

The codes written under the theme of "External sources of noise pollution" are "*horn/siren, traffic, construction equipment, airplane, car, construction, motorcycle, transportation sound, animals, chainsaw, gunshot, ambulance, helicopter, train, truck, explosion, road work, dynamite, exhaust, thunder, fire engine*". It was observed that science teacher candidates wrote 208 concepts (34.84%) under this theme. The code that is not included in the table because the science teacher candidates wrote it once is "bus".

The codes written under the theme of "Indoor sources of noise pollution" are "*loud noise/shouting, music, speaker/sound systems, people, fight/arguing, vacuum cleaner, crowd, screaming, home appliances, baby crying, alarm, telephone, washing machine, doorbell, television, mouth smacking, child, fan, blow dryer, hood, rustling, drill, unnecessary talk, hum*". It was observed that science teacher candidates wrote 206 concepts (34.51%) under this theme.

The codes written under the theme of "The effect of noise on human health" are "*stress, discomfort, headache, nervousness, fatigue, distraction, psychological problems, deafness, insomnia, depression*". It was observed that the science teacher candidates wrote 66 concepts (11.05%) under this theme. The codes that are not included in the table because the science teacher candidates wrote it once are "*unhappiness, inefficiency, tinnitus, depressed mood*".

The codes written under the "Noise pollution and sound" theme are "*sound, decibel, noise, frequency, intensity, high wavelength*". It was observed that science teacher candidates wrote 58 concepts (9.72%) under this theme.

The codes written under the theme of "Areas with noise pollution" are "*entertainment venues, factory, big city/metropolis, concert, shopping mall, wedding halls, school, match, airport*". It was observed that science teacher candidates wrote 56 concepts (9.38%) under this theme.

There is only one code under the theme of "Prevention of noise pollution". It is also "*sound insulation*". The total percentage value for this theme is 3.

In addition, a model was created with the themes created (Figure 2).

Figure 2. Cognitive Model Created For Noise Pollution of Science Teacher Candidates

When the drawings of science teacher candidates about noise pollution are examined, it is seen that there are 4 different themes: "Types of noise (f=24)", "Negative effect (f=14)", "Transportation vehicles and traffic (f=14)" and "Health problems (f=8)" has been reached.

A sample drawing with code of the science teacher candidates 29 belonging to the theme "types of noise" is given below (Figure 3);
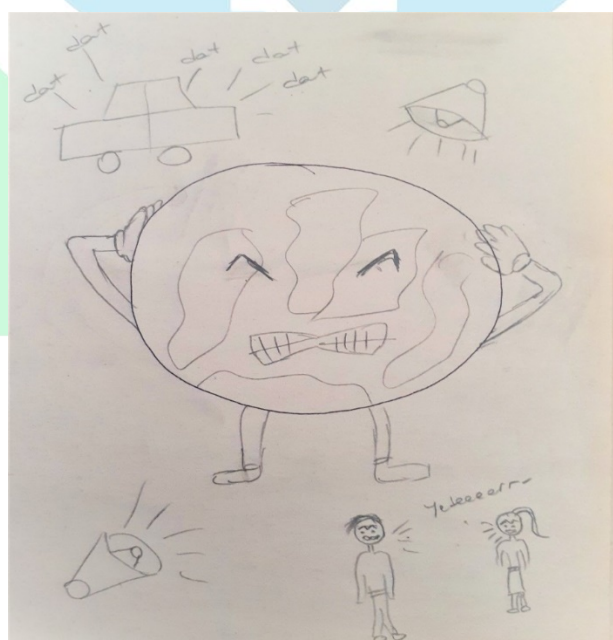
Figure 3. Example of Drawing of the Theme "Types of Noise"

Examples of some expressions of science teacher candidates belonging to the theme of "Types of noise" are presented below;

> **Science teacher candidates 9:** *There are many factors that cause noise pollution, such as the sounds of horns from cars, the sounds of construction, the sound of shopkeepers.*
>
> **Science teacher candidates 33:** *Car horns, noisy people, loud television or radios are some of the noise pollution we may encounter in our daily lives.*
>
> **Science teacher candidates 34:** *With the increase in the number of motor vehicles, factories and buildings due to urbanization, the number of people has also increased a lot. All these factors are a cause of noise.*

A sample drawing with code of the science teacher candidates 43 belonging to the theme "Negative effect" is given below (Figure 4);

Figure 4. Example of Drawing of the Theme "Negative Effect"

Examples of some expressions of science teacher candidates belonging to the theme of "Negative effect" are presented below;

Science teacher candidates 30: Noise affects all living things negatively. That's why reducing noise causes happier creatures.

Science teacher candidates 43: The sound that people create with their own voices and with the tools and tools they use affects not only people but the whole world negatively. Let's not make noise for a quiet and peaceful world for a stress-free life!!

A sample drawing with code of the science teacher candidates 8 belonging to the theme "Transportation vehicles and traffic" is given below (Figure 5);

Figure 5. Example of Drawing of the Theme "Transportation Vehicles and Traffic"

Examples of some expressions of science teacher candidates belonging to the theme of "Transportation vehicles and traffic" are presented below;

Science teacher candidates 19: The sounds coming from the exhaust of the car disturb people. The noises coming from the engines of the vehicles in the sea affect the creatures living in the sea more than people. At the same time, the noises coming from the propeller and engine of the aircraft disturb people.

Science teacher candidates 20: The fact that airports are very close to residential areas causes noise pollution. Having too many personal cars on the roads causes a lot of noise.

A sample drawing with code of the science teacher candidates 33 belonging to the theme "Health problems" is given below (Figure 6);

Figure 6. Example of Drawing of the Theme "Noise Types"

Examples of some expressions of science teacher candidates belonging to the theme of "health problems" are presented below;

Science teacher candidates 10: There is so much noise pollution in human life that people are affected by this situation. Noise pollution is so effective in every moment of our lives that it becomes unbearable for human life. Therefore, health problems arise directly and indirectly.

Science teacher candidates 26: Noise pollution affects people psychologically, physically, etc. It can affect and disturb aspects. The person may be exposed to these situations even if he or she does not want to.

Discussion, Conclusions and Recommendations

In this research, when the data obtained from the drawings made by the controlled word association test used to determine the perception of noise pollution by the science teacher candidates, it was seen that the science teacher candidates' sensitivity to noise pollution was not sufficient. The drawings made by the science teacher candidates and the data obtained from the word association test support each other.

The answers given by the science teacher candidates are "External sources of noise pollution", "Indoor sources of noise pollution", "The effect of noise on human health", "Noise pollution and sound", "Areas with noise pollution" and "Prevention of noise pollution" grouped under 6 themes.

Regarding the concept of noise pollution, science teacher candidates mostly produced codes for the themes of "External noise pollution sources" (f=206) and "Indoor noise pollution sources" (f=206). Parallel to the increase in the quality of life, the number of sources causing noise has increased day by day (Kocataş, 2003: 481). For this reason, it can be accepted as a natural result that the codes produced under these themes are excessive. The codes produced the most under the theme

of "External sources of noise pollution" are "*horn/siren (36), traffic (27), construction machinery (22), airplane (19), car (18) and construction (18)*", respectively. At the beginning of the noise experienced in the cities is the problem of heavy traffic. Road traffic is by far the largest source of noise pollution, according to recent assessments published by the European Environment Agency (EEA, 2017). In particular, unnecessary horns of drivers increase the noise even more (Talas, 2018: 120). The codes produced the most under the theme of "sources of indoor noise pollution" are respectively "*loud noise/shouting (27), music (26), loudspeaker/sound systems (24), human (22), fighting/arguing (15) and vacuum cleaner (12)*". The activities carried out by people are generally a source of noise (Önder & Gülgün, 2010). Loud music and televisions in residences and indoors, and the sounds made by the tools used in maintenance and repair also cause noise pollution (Talas, 2018: 120). Similarly, 8th grade students were found to have *exhaust, loudspeaker sounds* and *factory noise* (Erduran Avcı et al., 2013) for noise pollution, while 5th grade students gave answers like *people shouting at each other, listening to loud music, horn sounds, TV, weather. air conditioner, etc. such as vehicle sounds, sounds from factories* and sounds from construction machines (Sadık (2014).

The codes produced under the theme of "noise pollution and sound" are "*sound (21), decibel (12), noise (8)* and *frequency (7)*" respectively. Sound, decibel and noise concepts are seen to be the most repetitive codes in this theme. Noise is already defined as an unordered sound spectrum and an unwanted form of sound. Decibel is a sound evaluation unit that is used in the control of noise and emphasizes the middle and high frequencies that the human ear is sensitive to (Özden & Gülgün, 2010:5).

The codes produced under the theme of "the effect of noise on human health" are respectively "*stress (16), discomfort (13), headache (11), irritability (6), fatigue (5) distraction (4), psychological problems (3), deafness (3), insomnia (3) and depression (2)*". Noise is the most common stressor (Ravindran et al., 2005). Sadık (2014) reached the codes of "*headache (12), insomnia (4), fatigue (2) and deafness (2)*" under the theme of noise pollution in terms of the effects of environmental problems on human health of 5th grade students. These findings are in line with the codes in our study.

The codes produced the most under the theme of "areas with noise pollution" are respectively "*entertainment venues (10), factory (10), big city/metropolis (8), concert (6), shopping mall (5), wedding halls (5) and school. (5)*". Shopping, entertainment, etc. The noises that occur as a result of outdoor activities such as outdoor activities are examples of the noises experienced in the cities (Önder & Gülgün, 2010:55 Noise affects learning negatively and can cause distraction for teachers and students in learning environments and situations that make learning difficult (Engin, Özen, & Bayoğlu, 2009).This situation attracted the attention of teacher candidates and they expressed the concept of "*school*" as an environment where noise pollution is experienced.

Under the theme of "prevention of noise pollution", there is only "*sound insulation*" code. It has been observed that science teacher candidates have produced very few concepts about preventing noise pollution.

The drawings made by the science teacher candidates were grouped under 4 different themes: "types of noise (f=24)", "negative effects (f=14)", "transportation vehicles and traffic (f=14)" and "health problems (f=8)". The drawings obtained show that science teacher candidates depict their perceptions of noise pollution in a simple and clear way. In the drawings, which are consistent with their answers to the word association test, the pictures of the noise types, which include the most noise sources, draw attention. Sadık, Çakan, and Artut (2011) examined the pictures of 206 5th grade students about environmental problems and found that they drew loud music and human figures in four of the 10 pictures depicting noise pollution. Similar drawings were also drawn by science teacher candidates. Özdemir Özden and Özden (2015) 6th, 7th and 8th grade students made drawings showing that noise pollution is caused by transportation vehicles and technological tools such as television, radio and music sets. It was observed that similar drawings were made under the theme of "transportation vehicles and traffic" (Figure 5).

As a result, noise pollution, which has become a part of the lives of people living in large settlements, is one of the environmental problems that we do not think much about. As a result of the activities people perform in their daily lives, it does not seem possible to live without making a sound. It is possible to eliminate this environmental problem if there is awareness about the problems caused by noise pollution. For this reason, conscious individuals should be tried to be raised starting from pre-school education. Teachers, who are role models in educating students, can design and implement various activities related to noise pollution in science and biology classes in order to raise awareness on this issue. Environmental education programs to be organized by various organizations to solve the problems related to noise pollution can also contribute to teachers. By determining the perceptions of students at different education levels, their awareness of noise pollution can be determined.

Ethic

This research was approved by Hatay Mustafa Kemal University Social and Human Sciences Ethics Committee with the decision dated 01.02.2022 and numbered E- E-21817443-050.99-131924.

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