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The Effects of Noise Pollution on the Academic Performance of EFL Learners at Kandahar University

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Abstract: Noise pollution is regarded as a fundamental aspect during learning and can significantly influence learners' academic performance; however, limited research has examined its impact on EFL learners and the specific sources of noise within Afghan universities. The study aimed to determine the effects of noise pollution on the academic performance of EFL learners and to identify the key sources contributing to noise pollution at Kandahar University. For this purpose, a quantitative survey design was employed, and the data were collected from EFL learners of the Faculty of Education at Kandahar University using a questionnaire. The target population consisted of 90 students, and 73 were randomly selected as the study sample. The collected data were analyzed using SPSS version 26, with descriptive statistics. The findings indicate that noise pollution adversely influences the academic performance of EFL learners, and high levels of noise negatively interfere with critical academic tasks such as reading, learning, studying, concentration, and exam performance. The findings also indicate that the majority of respondents were neutral toward the sources of noise. Only the transportation of unregulated vehicles within the university was identified as a contributing source of noise pollution, while sources such as cleaning activities, fan spinning, security alarms, musical programs, and cultural events were not determined to be disruptive noise sources. To better understand the effects of noise and its contributing sources, the research highlights the need to include teachers' perspectives and to investigate the health impacts of noise pollution on students.

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INTRODUCTION

Learning plays a key role in every human being's life. Generally, learning refers to the process of acquiring knowledge, skills, and behaviors through study, practice, experience, and observation, which can change performance, knowledge, and brain function (American Psychological Association, n.d.). Learning happens best when the environment is positive,

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supportive, calm, and relaxed, and when everything is emotionally well organized. A conducive learning environment minimizes physical and psychological distress, enhances learners' concentration, promotes logical thinking, and contributes to better academic achievement (Ibem et al., 2017).

Learning and a calm environment are closely interconnected, as a calm environment plays a significant role in shaping how individuals learn; it reduces interference, stress, and anxiety, leading to better learning outcomes (Darling-Hammond & Cook-Harvey, 2018). On the other hand, research has shown that an unrelaxed and noisy environment has a negative impact on students' academic performance. Ogwo et al. (2019) provide empirical evidence that noise pollution adversely affects learners' educational performance by disturbing the flow of communication between lecturers and learners, diverting learners' attention during lectures, making it challenging to complete planned lessons, diminishing students' interest in class activities, reducing their participation, and interfering with their comprehension abilities.

Generally, noise can be defined as any unwanted or unpleasant sound (Britannica Encyclopedia, n.d.). In contrast, noise pollution refers to loud sounds that are annoying and disruptive when heard (Britannica, n.d.). In addition, Akhtar et al. (2013) define noise pollution as any offensive sound that unreasonably interferes with daily life. In educational contexts, noise pollution is a critical environmental factor that directly affects teaching and learning processes.

Noise pollution has been linked to a wide range of physical and psychological health problems. Ismail and Ahmed (2018) state that exposure to high levels of noise can lead to hearing weakness, high blood pressure, sleep disturbances, and heart-related problems. In addition, Ibrahim (2018) argues that high levels of noise result in difficulty in hearing, feeling uncomfortable, headaches, reduced attention, and raising voice levels during speech. These findings indicate that noise pollution poses serious threats to both physical well-being and cognitive functioning, which are essential for effective learning.

Unwanted noise negatively influences learners' cognitive and academic performance. According to Diaco (2014), noise pollution in educational campuses affects students' cognitive performance, diminishing their ability to learn. Furthermore, high levels of noise significantly impacttudents' academic performance (Ogwo et al., 2019). Research further indicates that noise adversely affects the educational performance of second-language learners more than that of first-language learners. (Goldschagg & Bekker, 2020) found that high levels of noise adversely affect second-language learners' concentration.

Regarding gender, noise pollution affects female students more adversely than male students. Studies suggest that female students are more sensitive to noise than male students, resulting in greater negative impacts on their academic performance (Said Abubakar et al., 2021; Seetha et al., 2008). Age is also an essential factor, as children are more affected by noise than adolescents. Klatte et al. (2013) stated that noise can negatively

influence children's learning more than adults' learning, as children are more sensitive to noise during task-based activities such as speech perception and listening comprehension.

Noise and poor classroom acoustics can reduce speech comprehension (B. M. Shield & Dockrell, 2003). Similarly, speech communication and learning can also be negatively influenced by high noise levels and poor acoustic conditions (Sala & Rantala, 2016). A calm, supportive, and relaxed learning environment is crucial for English as a Foreign Language (EFL) learning. A clean, quiet, and comfortable physical environment, plus a supportive and collaborative social setting, play significant roles in English language learning by boosting students' focus, communication, and motivation (J. Zhang, 2023).

A good understanding of the teaching subject and having strong teaching skills can help students achieve positive academic results (Xhaferi, 2017); however, noise pollution can negatively affect teachers' instructional performance. Enmarker and Boman (2004) claim that teachers are more sensitive to loud noise, which negatively influences their hearing and may result in increased annoyance and reduced teaching performance. In some cases, inadequate teacher preparation can also contribute to noise pollution. Mustafa & Al-Hamadi (2017) identify inadequate teacher preparation as a significant source of classroom disturbance, which negatively affects the learning process.

Research has shown that noise pollution can arise from a variety of sources. According to Babisch (2011), exposure to road traffic and airplane noise increases the risk of heart-related problems and high blood pressure. Similarly, Nazneen et al. (2020) state that exposure to road traffic noise plays a significant role in increasing health-related issues. Moreover, Shield et al. (2008) suggest that students' learning can be notably affected by background classroom noise. In addition, conversations between students and unwanted sounds from tables and chairs are also disturbing sources of noise pollution (Lundquist et al., 2000). Singh and Davar (2004) define vehicles and loudspeakers as primary sources of noise pollution. Other sources of interruptive noise include student gatherings on campus, parking areas, streets, and power supply units (generators) (Ibrahim, 2023).

Noise pollution has been a significant challenge in schools, disrupting classroom environments and hindering students' listening and learning (Fatima et al., 2023). Similarly, Kandahar University has been struggling with issues such as excessive indoor noise, outdoor noise, and ongoing construction work. Failure to address this problem might negatively affect students' learning achievements. Gilavand and Jamshidnezhad (2016) reported that noise within educational campuses negatively affects students' learning and academic performance.

Previous studies in Afghanistan have primarily focused on measuring environmental noise levels and identifying noise sources in urban areas (Shirzad et al., 2024). However, there is a lack of empirical research examining the impact of noise pollution on students' academic performance, particularly among EFL learners in higher education institutions. This highlights the need to investigate the problem in the Afghan higher education context to generate

evidence-based recommendations for creating appropriate learning environments and improving academic outcomes.

Specifically, the present study aims to achieve the following objectives:

1. To determine the effects of noise pollution on the academic performance of EFL learners at Kandahar University.
2. To identify the key sources contributing to noise pollution in EFL classes at Kandahar University.

The findings of this study are expected to benefit university administrators, teachers, and policymakers at Kandahar University and other public and private higher education institutions in Afghanistan. By addressing the factors that contribute to noise disturbance, the research aims to identify strategies for creating a more conducive learning environment, which may help teachers and students achieve better learning outcomes.

RESEARCH METHOD

A quantitative survey research design was employed, which was appropriate for collecting standardized data from a large group of participants. The quantitative survey approach was selected because it allows the collection of numerical data that can be statistically analyzed to determine the effects of noise pollution on the academic performance of EFL students. In addition, this design enables the identification of key sources of noise pollution affecting learners. Therefore, the quantitative survey design was considered suitable for achieving the study's objectives and providing evidence-based findings.

Study Site

Kandahar University is located in the southern part of Kandahar, Afghanistan, and the Education Faculty is part of the university. Moreover, noise pollution is a pressing challenge at the university, especially in EFL classrooms, where focus and comprehension are crucial for understanding the content. Therefore, the Faculty of Education, Department of English Language and Literature, was chosen as the research site for the study.

Population and Sampling

The target population consisted of all EFL students of the education faculty enrolled at Kandahar University during the 2025 academic year, totaling 90 students. A simple random sampling technique was employed to ensure every student had an equal opportunity of being selected. This sampling method was appropriate for the study because it minimizes selection bias and ensures representativeness of the population (Creswell, 2013). The Krejcie and Morgan (1970) table was used to determine the appropriate sample size for a population of 90, resulting in a sample of 73 students. Before completing the questionnaire, participants were informed about the study's purpose and provided consent.

Instrumentation

To address the research objectives, Participants completed a questionnaire. The questionnaire consisted of three parts; the first part was to describe the age and class level of the respondents. The second part of the questionnaire was to determine the effects of noise pollution on the learning performance of EFL learners, and the third part was to identify the available sources of noise pollution at Kandahar University that contribute to lower academic performance. Hence, the questionnaire was distributed to the selected participants, comprising 25 items. All items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Validity and Reliability

To ensure validity, the questionnaire was assessed by two EFL teaching experts, who reviewed each item for clarity, relevance, and significance, and provided feedback. To ensure reliability, a pilot test was conducted on 20 students who were not part of the main study sample. The reliability analysis yielded a Cronbach's Alpha of .794 across 25 items, indicating an acceptable level of internal consistency.

Table 1. *Reliability Statistics*

Cronbach's Alpha	Number of Items
.794	25

Data Analyses

This study employed a quantitative research approach, and a structured questionnaire was distributed to 73 EFL students enrolled in the Faculty of Education, English Language and Literature Department. The collected data were analyzed using SPSS version 26, employing descriptive statistics. Frequencies and percentages were calculated to summarize the participants' demographic characteristics. Additionally, to measure the central tendency and variability in students' responses, means and standard deviations were calculated.

Ethical Consideration

This research was conducted in accordance with ethical considerations. Respondents were informed of the study's purpose, and their consent was obtained before they voluntarily participated. To begin the research, approval from the Education Faculty, English language and literature, was obtained. Also, ethical principles were followed throughout data collection and reporting.

FINDINGS

This section presents the specific findings of the current study in relation to the research objectives. The findings are organized into three main parts. The first part describes the participants' demographic characteristics, including age and class level. The second part reports the findings related to the effects of noise pollution on students. The third part

presents the identified sources of noise pollution. To ensure clarity, each part is offered under its own subtitle.

Demographic Data

This section presents the demographic characteristics of the participants. The demographic information, including participants' class level and age, is presented in Tables 2 and 3 below.

Table 2. *Class of the Participants*

Class	Frequency	Percentage
Freshman	26	35.6
Sophomore	24	32.9
Junior	13	17.8
Senior	10	13.7
Total	73	100

Table 2 presents the distribution of participants by academic level. The analysis shows that among 73 participants, the largest group was freshmen (35.6%) and sophomores (32.9%), while fewer were juniors (17.8%) and seniors (13.7%). This indicates that the majority of the sample were from the first and second years of the English department.

Table 3. *Age of the Participants*

Age Group	Frequency	Percentage
18-20	23	31.5
21-24	39	53.4
25-28	10	13.7
Above 28	1	1.4
Total	73	100

Table 3 shows the age distribution of the participants. Out of 73 respondents, the majority (53.4%) were aged between 21 and 24 years, while (31.5%) of the students were 18-20 years old. Only (13.7%) were aged 25-28, and a tiny portion (1.4%) were above 28. This shows that most of the participants were young adults in their early twenties.

The Effects of Noise Pollution on EFL Learners

The first objective of the current study was to determine the effects of noise pollution on the academic performance of EFL learners at Kandahar University, and the relevant findings are presented in Table 4 below.

Table 4. *The Effects of Noise Pollution on EFL learners*

No	Item	Mean	Std. Deviation
1.	High noise affects my reading ability.	4.13	1.109
2.	High noise interrupts me during the exam.	4.10	1.074
3.	High noise interrupts my learning.	4.09	1.043
4.	High noise makes me less motivated to study.	4.09	1.016
5.	High noise interrupts my concentration during lessons.	4.08	1.255

6.	High noise negatively affects my overall academic performance.	4.06	.976
7.	High noise interrupts my listening ability.	3.93	1.071
8.	High noise interrupts our speech communication.	3.91	1.127
9.	High noise negatively affects my cognitive performance.	3.91	1.063
10.	High noise interrupts my speech intelligibility or comprehension.	3.90	1.107
11.	High noise interrupts my concentration when writing.	3.20	1.142

Table 1 presents the mean scores for the impact of noise pollution on the academic performance of EFL learners at Kandahar University. All the items in Table 1 have mean scores between 4 and 3. It can be inferred that all responses fall within the range of agree and neutral. Statement that gained highest mean score are “High noise effects my reading ability” (M= 4.13 SD= 1.109), “High noise interrupts me during exam” (M= 4.10 SD= 1.074), “High noise interrupts my learning” (M= 4.09 SD= 1.043), “High noise makes me less motivated to study” (M= 4.09 SD= 1.016), “High noise interrupts my concentration during lessons” (M= 4.08 SD= 1.255), “High noise negatively effects my overall academic performance” (M= 4.06 SD= .976). Items that gained lower mean scores are “High noise interrupts my concentration when writing” (M= 3.20, SD= 1.142), “High noise interrupts my speech intelligibility or comprehension” (M= 3.90, SD= 1.107), “High noise negatively affects my cognitive performance” (M= 3.91, SD= 1.063).

Overall, the data clearly suggest that noise pollution negatively affects the academic performance of EFL learners at Kandahar University. The majority of students reported that a high level of noise interferes with critical academic tasks such as reading, learning, studying, concentration, and exam performance.

Sources of Noise Pollution at Kandahar University

The second objective of the current study was to identify the key sources contributing to noise pollution in EFL classes at Kandahar University, and the relevant findings are presented in Table 5 below.

Table 5. *Contributing Sources of Noise Pollution at Kandahar University*

No	Item	Mean	Std. Deviation
1.	Unregulated vehicle movements (bikes, cars, trucks, and bulldozers).	3.67	1.463
2.	Ongoing construction activities.	3.38	1.533
3.	Outside noise.	3.28	1.399
4.	Mechanical equipment (generator, concrete mixer).	3.24	1.497
5.	Noise from other classes.	3.24	1.372
6.	Overcrowding in class.	3.13	1.346
7.	Corridor noise.	3.10	1.663
8.	Inside noise.	3.10	1.275
9.	Phone ringtone & notification.	3.08	1.330
10.	Fan spinning noise.	2.80	1.329
11.	Cultural programs.	2.49	1.395
12.	Security alarms.	2.49	1.395
13.	Cleaning activities (Vacuuming, floor polishing).	2.39	1.450
14.	Musical events.	2.20	1.257

The findings in Table 5 show the mean scores for the contributing sources of noise pollution at Kandahar University. All items in the table have mean scores between 3 and 2. It

can be inferred that all responses fall within the neutral and disagree ranges. The findings suggest that most students at Kandahar University are neutral about the variety of sources on campus. This means they are not entirely in agreement or disagreement about whether these noises are disruptive. The only source that achieved the highest mean score was “Unregulated vehicle movements” (M = 3.67, SD = 1.463). Sources that gained lower mean score are “Musical events” (M= 2.20 SD= 1.257), “Cleaning activities” (M= 2.39 SD= 1.450), “Security alarms” (M= 2.4932 SD= 1.395), “Security alarms” (M= 2.49 SD= 1.3950), “Fan spinning noise” (M=2.80 SD= 1.329).

In short, the analysis reveals that respondents were neutral primarily about the different sources contributing to noise pollution. While unregulated vehicle movements were found to be the most significant noise source at Kandahar University, sources such as musical events, cleaning activities, cultural programs, fan spinning, and security alarms were not the key contributors to noise pollution.

DISCUSSION

The first objective of the study was to determine the effects of noise pollution on the academic performance of EFL learners at Kandahar University. The results show that noise pollution negatively affects students’ academic tasks, including reading, learning, studying, concentration, exams, and overall academic performance. The majority of respondents believed that a high level of noise affects their reading ability, which is consistent with the findings of Connolly et al. (2019), indicating that adolescent’s reading comprehension is particularly affected by high levels of classroom noise. In addition, students reported that high levels of noise disrupt their exams. This aligns closely with the results of Zhang and Navejar (2018), who noted that exposure to high noise is associated with lower test scores and that approximately 40% of students were significantly disturbed by high noise during the math test.

The findings also indicate that high noise levels make learning difficult, consistent with the results of Buchari and Matondang (2017), who found that high noise negatively impacts students' learning performance. Ali et al. (2023) similarly claim that noisy educational campuses can negatively affect learners' learning, health, and well-being. In line with Visentin et al. (2023), the present study found that exposure to high levels of background noise reduced students’ motivation to study. Their research indicated that noise impaired learners’ effort and motivation during classroom listening tasks.

Noise was also found to disrupt concentration during lessons, consistent with Ogwo et al. (2019) and Abduljabbar Ibrahim (2018), who found that poor attention is a consequence of noise pollution. Additionally, the data revealed that high noise negatively affects students' overall academic performance, in line with the literature reviewed, which indicates that a high level of noise has a significant impact on students’ academic performance (Ogwo et al., 2019). Moderate effects were also observed for listening, speech, and cognitive performance, though these were less significant than the substantial impact observed for motivation,

reading, and concentration. While students in the current study stated a neutral effect of noise on their writing ability, previous research has shown that background music can objectively disrupt students' writing productivity (Ransdell & Gilroy, 2001).

The second objective of the study was to identify the significant sources of noise pollution at Kandahar University. The results indicated that most respondents were neutral toward the different sources, suggesting they did not strongly perceive most campus noises as disruptive. However, unregulated vehicle movements within the university were identified by students as a disturbing noise source. This finding aligns with Ali and Mohamad Hussain (2018), who indicated that motorcycle noise notably influences cognitive performance. Similarly, Ismail and Ahmed (2018) identified vehicles as the primary source of noise pollution; they also highlighted loud music as the secondary contributor, which contrasts with the current study's finding, where music was not considered disruptive. Cleaning activities were also not perceived as significant sources of noise in the present study, unlike the findings of Atamer and Altinsoy (2023), who noted that vacuum cleaner noise can be annoying, especially when it is sharp and loud. Moreover, the participants didn't report disturbance from security alarms, whereas Hall et al. (2016) found that exposure to emergency alarms can significantly increase heart rate and cause physiological stress. Overall, the results suggest that vehicular noise is the prominent concern at Kandahar University, while other potential sources are perceived as less impactful by students.

While noise pollution is a pressing issue at Kandahar University, the study examined only the effects and sources of noise from students' perspectives, which is a limitation. Future research could provide a more comprehensive understanding by examining noise pollution from the teachers' perspectives as well. Another limitation of this study is the relatively small sample size; collecting data from a larger group of participants would ensure more accurate, fair, and generalizable results. Moreover, this research only focused on the effects of noise pollution on students' academic performance. Future studies could also investigate the impact of noise on students' health and well-being. Considering these limitations, it is recommended that future research examine the effects of noise pollution on both lecturers and students from other faculties at Kandahar University, with particular attention to potential health impacts.

CONCLUSION

This study aimed to determine the effects of noise pollution on the academic performance of EFL learners and to identify the primary sources of noise pollution at Kandahar University. A quantitative survey design was employed, and questionnaires were distributed to the students. The findings revealed that noise pollution negatively affects students' academic performance, particularly their reading, learning, concentration, motivation, exam performance, and overall learning outcomes. The results also indicated that no single primary source contributed to noise pollution, except for unregulated vehicle movements, which students identified as a significant source. It is recommended that future research include

larger samples and consider teachers' perspectives, while the university should implement practical measures to control vehicle noise and create a quieter learning environment.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interest.

AUTHORS CONTRIBUTION

The first author conducted the study. Data was collected by the first author, while data analysis using SPSS was performed by the second author. All authors contributed to the interpretation of the results, manuscript writing, critical revision, and approved the final version of the manuscript.

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The authors declare that this research did not receive any external funding.

DATA AVAILABILITY STATEMENT

The data used in this study were collected through questionnaires and are not publicly available due to confidentiality concerns. However, the data may be obtained from the corresponding author upon reasonable request.

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