

Study of the Improvement of Noise Pollution in University of Sulaimani in both New and Old Campus

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Abstract

In this research, the sound pollution as an unpleasant physical effect on educational area in university of Sulaimani has been studied. Since 2013, the University of Sulaimani has two campuses old and new and all the scientific departments distributed between both campuses. While in 2011, it had only one campus in the center of the city and almost all of the departments were placed there. This study has selected three different locations in both old and new campus of the University of Sulaimani to measure the noise level in their surroundings. These data have been reviewed and compared to the data that have been taken previously at the same places in December 2011. The results show a noticeable reduction in the intensity of noise in both new and old campus. This improvement, which is the result of increasing education space and convey most of the departments from the center of the city, can positively affect the education in the university.

Keywords: Sound pollution; University of Sulaimani; New campus; Old campus; Noise level

Introduction

Urban Noise pollution has a significant impact on the quality of life and thus potentially on Public health. Noise pollution parallels to air pollution is an important issue in an increasing number of megacities around the world, and new policies to address urban noise pollution are likely to be enacted in many developing countries irrespective of the participation of these countries in any explicit future noise pollution policies [1]. Increasing vehicles and the population of people that make cities crowded directly affect the noise pollution and quality of life which are often highly correlated due to shared generating processes [2]. In modern life many types of pollutions have raised, one of them is noise pollution, which is the result of modern technology and urbanization of the cities [3]. Furthermore, increasing noise pollution has negative effects on personal and public health. The World Health Organization has reported seven categories of adverse health effects of noise pollution on humans. According to their report, noise pollution can be responsible of hearing impairment, interference with spoken communication, sleep disturbances, cardiovascular disturbances, disturbances in mental health, impaired task performance, negative social behavior and annoyance reactions [4]. Noise pollution in university campuses can effect on education and research process by all above diseases except sleep disturbance. According to a research, students who have high resting blood pressure, high stress levels and also experience reading delays are those who exposed to noise pollution during learning. In addition, students who suffer from noise pollution learn to not pay attention to the lecturer, which can harm their reading and language skills [5,6]. Therefore, the control of intensity of noise in an educational place must be studied. In university, a number of students, vehicles and some generators are responsible for noise. Thus, improving areas of education and transpose Universities to out of city can reduce the noise. University of Sulaimani is the largest university in Kurdistan Region of Iraq that has two campuses, old (35°34'01.7"N45°26'38.8"E) and new (35°34'41.4"N45°21'34.7"E). In December 2011, a study was conducted on noise pollution in the old campus of the University of Sulaimani [7]. This research will show the level of noise pollution in the educational area using a digital noise dosimeter with a range of 43-130dB. The areas chosen for the study were totally 25 different locations, including corridors between classes at different floors in five colleges

and 3 other regions chosen from the campus field of the University. However, in the current research, three different locations in both old and new campus have been selected to study the level of noise pollution. Similarly, the noise pollution in three different points of the University of Sulaimani in both old and new campus has been measured using the same instrument in different days of December 2013 and compared to the same three places that has been taken earlier in 2011.

Results and Discussions

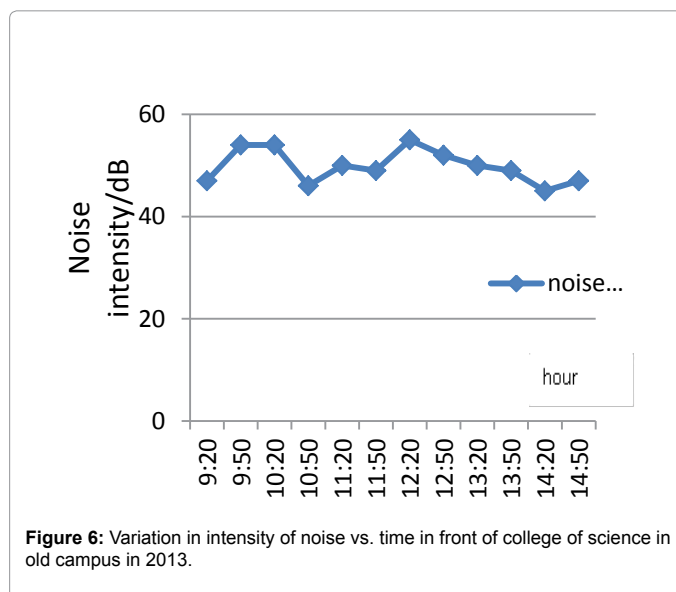
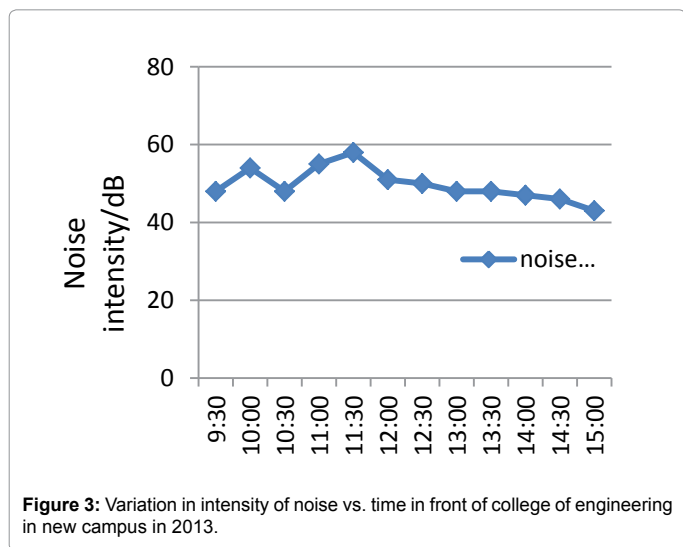
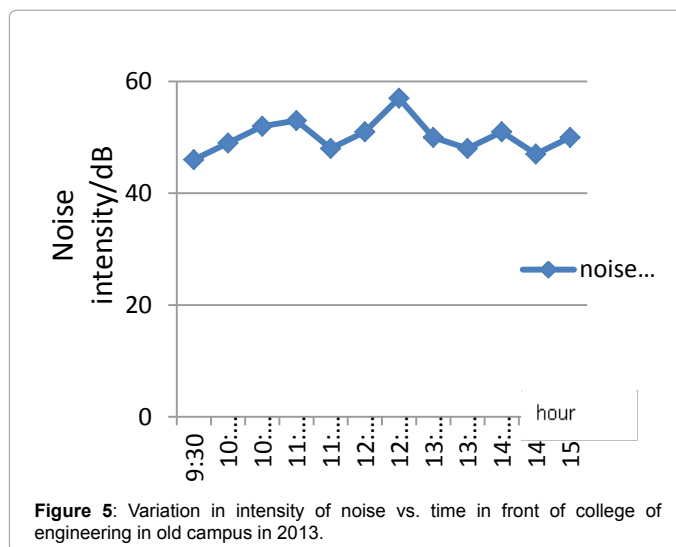
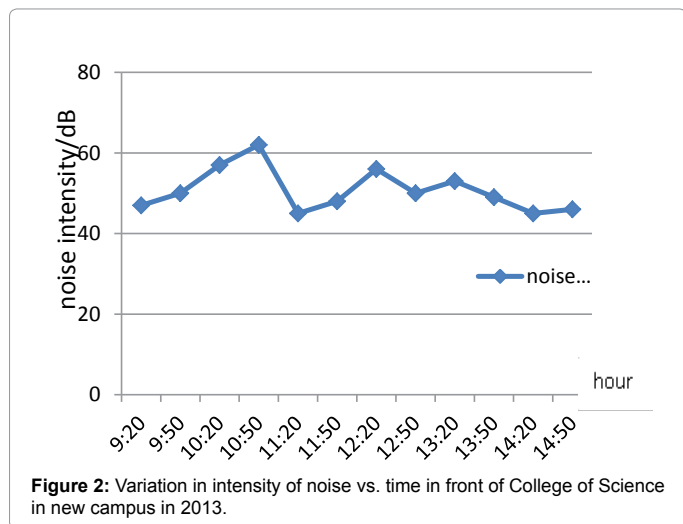
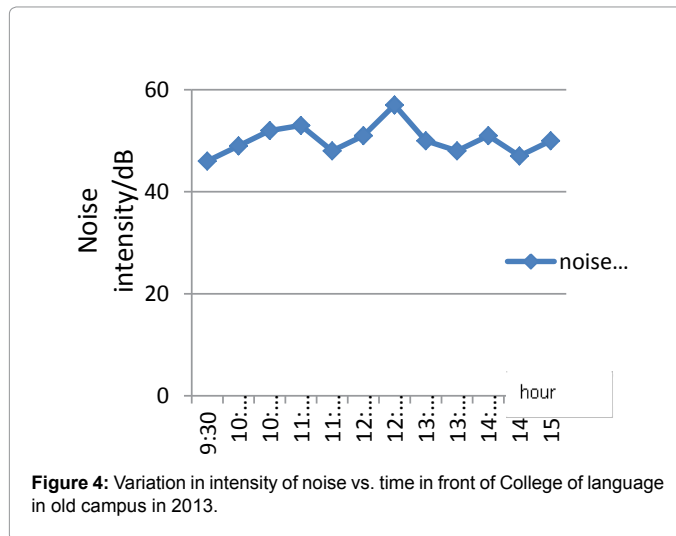
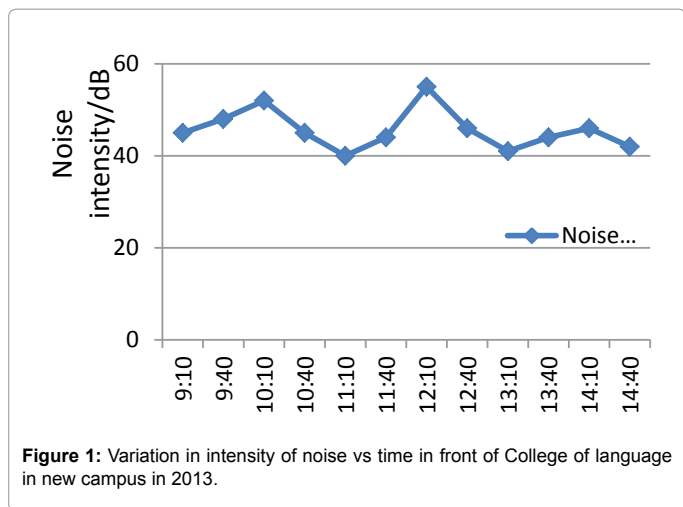
The noise pollution has been measured by a digital noise dosimeter with a range of 43-130 dB in three different points in the University of Sulaimani in both old and new campus in different days of December and the average of these data has been plotted. The first three figures (Figures 1-3) and the second three ones (Figures 4-6) shown above represent the intensity variation of the noise, which were taken in dB between 9:10 to 14:40 in 2013, in front of the colleges of language, science and engineering in new and old campus respectively. While Figures 7-9 shows the variation of noise in the same (old) campus in December 2011. In 2013, most of the students in old campus have been moved to new campus but the old campus still has few colleges with many students. In Figures 7-9 the reduction in intensity of noise can be noticed in both campuses. In 2011, the average of intensity of noise in college of language was between (60-80) dB while this number decreased to (40-55) in new campus in 2013 and a lessening in noise of about (20-25) dB can be noticed. Similarly, a decreasing in intensity of noise can also be observed in old campus. The noises in old campus reduce to (45-50) and show a reduction of (15-30) dB. The average intensity of noise in college of science was between (60-80) dB in 2011,

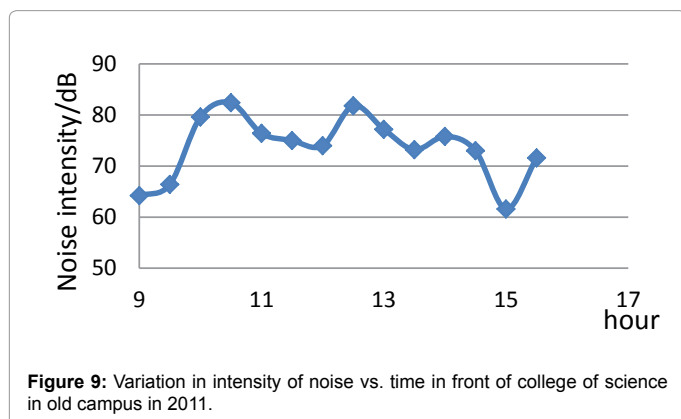
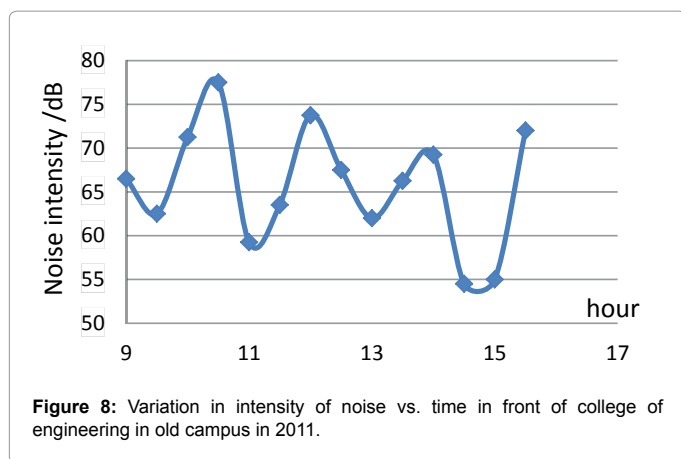
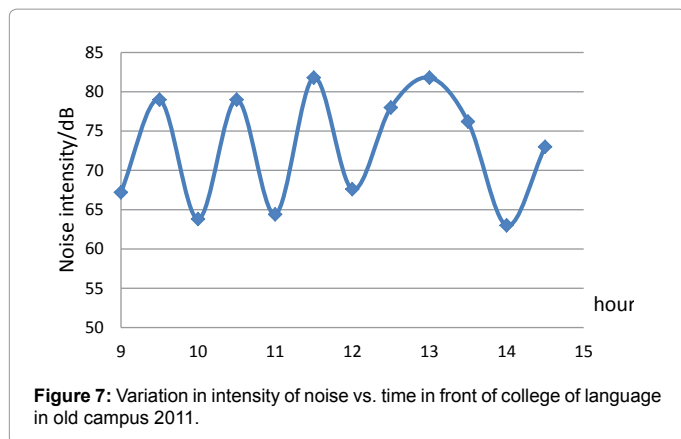
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of Sulaimani uses the new campus with vast area, new technology and modern design as well as the old campus while in 2011, the university had only one campus (old campus) in most crowded place of the city. This result positively affects the education in the University and the rank of the university has raised.

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whereas this quantity is reduced to (45-60) dB in new campus in 2013 and to (45-55) dB in old campus, which means that, the reduction in intensity of noise becomes (15-20) dB in new campus and 15dB in old campus. Similarly, for college of engineering a large decreasing in intensity of noise can be seen. Average of noise in college of engineering was (55-75) dB in old campus in 2011, while it has become (40-60) dB in new campus and (45-55) dB in old campus in 2013. Therefore, the reduction in a noise was 15 dB in new campus and (10-20) dB in old campus in 2013. These data show an obvious reduction in a noise in the University of Sulaimani in both old and new campus, which is the result of increasing spaces for education in the university and transferring most of the colleges to the outside of the city because the University