Malaysian Music Journal Vol. 3, Num. 2 (32-47)
ISSN 2232-1020

Noise Exposure in the Malaysian Living Environment from a Music Education Perspective

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Abstract

The objective of this paper is to determine if the present state of noise exposure in the Malaysian living environment can be both a research and practical problem from the perspective of music education, by looking into the quality of the noise and its implications on the growth of a person. An impression of noise exposure level formed by using sound level meter reveals that social venues for Malaysians in their daily life could be noisier than industrial areas, many of which exceeded the recommended noise level set by the Department of Environment of Malaysia. An impression of the sound texture formed by analysing the recorded soundscape reveals a sharp contrast between the rural and urban areas in Malaysia in terms of quantities and varieties of sound source. Reflecting the findings of sound survey upon the Music Educationist's Framework to Approach Noise/ Sound in Living Environment, it is found that the noise exposure in the Malaysian living environment may pose threats to the quality of life of students, including their learning efficiency. Hence, it is a valid problem for music educationists to deal with both in their research and practical teaching.

Keywords *Noise exposure, environmental noise, sound, living environment, music education*

Introduction

The impact of sound on humans' well being can be approached from both psychoacoustic and ecological perspectives. The psychoacoustic perspective focuses on the effect of perceiving, either through hearing or feeling the vibration of sound, examining what transpires within a person in response to sound that is surrounding him/her. This aspect touches on the memory of sound, emotions aroused by sound, and evaluation towards sound remembered, and is influenced by ideas, conceptualisation and beliefs rooted in a culture within a particular space and time. The ecological perspective, on the other hand, takes sound as part of the humans' living environment, and concerns primarily the sound source: their types, characters, projection methods and the way changes in sound source influence the quality of human life in a society.

The underlying philosophical position of the author for this paper is that the process of human growth is impacted by the presence of sound in the environment, and that sound in the environment affects the well being of human society as a whole. Audio information, including the perception of sound and audiation or inner hearing, forms a major part of our cognition. Sound penetrates deeply into the human perception,

shaping their being. The significance of the use of sound in human fundamentals is clearly told in religious practices and rituals. From the perspective of health, high doses of sound exposure in the daily life of people in industrialised societies, with the frequent use of electronic sound devices like microphones, speakers, amplifiers and headphones, and the omnipresence of machinery that produces noise, has been a concern.

The high dose of noise in the daily life of multicultural and developing Southeast Asian societies can be observed through the heavy use of automobiles and speakers in the street, markets, as well as residential areas. In addition, many Malaysians would have suffered from over amplified concerts and events, such as kindergarten annual concerts, karaoke competitions, fundraising dinners, as well as public lectures. Discomfort due to the presence of a high level of noise in cities in Malaysia is frequently mentioned in individuals' conversations, but no empirical data on sound environment in Malaysia is available at the time of writing.

A systematic approach to the impact of over exposure to environmental noise on the health and life quality of the citizens in the country will require a series of research projects that examine 1) noise levels in various situations in the community's life; 2) the hearing capacity of the citizens; and 3) the risk of hearing impairment to the citizens caused by the environmental noise. In reality, such studies are unlikely to be conducted in the near future here. In a developing country like Malaysia, the need for research funding to examine occupational health – particularly on noise regulation in factories – is more pressing. The effect of environmental noise on a citizen's health is a less prioritised topic. In addition, there are methodological issues in measuring the general impact of noise on the health of a citizen in a society because the noise exposure levels of individuals vary according to the lifestyles, area of residence and work. Even though the high dose of environmental noise in Malaysia is prevalent through personal experience, we lack the accumulation of empirical data as well as a sound methodology to collect empirical data to prove it.

Acknowledging the long wait before empirical data can be transferred into preventive action to improve quality of life for the issue of non-occupational/ environmental noise, the author gathers that it is in the field of music education that we can move things a little faster. From action-based perspectives, the way educationists apply empirical data is different from the scientist. Above all, music educationists bring a unique way of conceiving problems related to sound. Sound does not only concern vibration and amplitude, the primary focus in occupational noise studies, but also concerns the frequencies and the way they are combined to provide layers of sound, which in music we sometimes call 'tone colour' and 'texture'. Music educationists are concerned not only with the *loudness* of the noise, but also *what kind* of noise that we are being exposed to in our daily life. Musical concepts, for example, rhythm, time, repetition, variation, polyphony, and others, are useful in perceiving the content of 'noise' in a more holistic manner.

Apart from conceiving the content of 'noise' holistically from a musical perspective, music educationists also consider the impact of environmental noise on a person holistically, and with a particular focus on the aesthetical growth of a person. The key question of a music educator with regard to the impact of noise on a person is this: How

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does the noise in the living environment affect the holistic growth of that student–in all dimensions including physical, mental, spiritual, social, aesthetic, and particularly, musical? Does the noise exposure level in the Malaysian living environment, besides affecting the health of the students, enhance or disturb the learning process of a student? Does it stimulate or jeopardise the creativity of a student? Does it provide stimuli that would inspire more musical activities?

Objectives

The objective of this paper is to determine if the present state of noise exposure in the Malaysian living environment can be both a research and practical problem from the perspectives of music education. By perspectives of music education I mean the way considerations are made as a music educator where 1) noise is considered in the same way music is considered, as having the qualities of dynamic, pitch, timbre, texture, and rhythm; and 2) a problem is established when the qualities of environmental noise are found posing threats to the holistic growth of a person (student), which includes musical growth.

The objectives are achieved by reflecting on some early data collected concerning noise exposure in the Malaysian living environment upon a Music Educationist's Framework in Approaching Sound/Noise in Living Environment (refer to the Literature Review section for this framework). The sub objectives are:

1. To form an impression of noise exposure in the Malaysian living environment from the dimension of loudness;
2. To form an impression of noise exposure in the Malaysian living environment from the dimension of texture;
3. To discuss if noise exposure in the Malaysian living environment is a problem for music education and music educators according to the items listed in the Music Educationist's Framework in Approaching Sound/Noise in Living Environment.

Definition of Terms

As the topic of sound and noise is rare in the local music and music education discourse, definitions of key terms used in this paper are necessary. **Noise** is commonly held as unwanted sound. In this paper study, however, the word noise is used rather in the context that it is an unintended sound (but not necessarily unpleasing). Both noise and sound are used in this article interchangeably. Both terms are used due to writing convention. **Environmental noise** in this article is no different from environmental sound, meaning sound that is present in the surroundings of a person or a group of people. Likewise, **noise exposure** is synonymous with sound exposure, meaning the state of a person or a location being exposed to various sounds that are present. When noise exposure is measured, it is the amplitude or loudness that is being measured. **Sound source** refers to the unit from whence a particular sound is produced, which may be an organism, human, machines, tools or a natural phenomena.

Literature Review
Noise measurement

Control of noise exposure has been one of the main components in occupational health. Standards in occupational health regard 85dB(A) (NIOSH's threshold of daily allowance) as the noise level that will produce physical harm to workers, providing the exposure is continuous for more than eight hours in a day. The Factories and Machinery (Noise Exposure) Regulations 1989 by the Malaysian Government set the permissible limit of exposure as:

1 No employee shall be exposed to noise level exceeding equivalent continuous sound level of 90 dB (A) or exceeding the limits specified in the First Schedule or exceeding the daily noise dose of unity.
2 No employee shall be exposed to noise level exceeding 115 dB (A) at any time.

The benchmark for occupational safety is understandably different from that for environmental quality. A pleasant hearing environment will have a lower/stricter dB figure, taking into consideration the psychological effect caused by noise. In Noise Manual, Berger regards 55dB and 65dB as already a level of concern.

> In the European community 40% of the population is exposed to transportation noise with an A- weighted equivalent continuous sound level (LAeq,T) exceeding 55 dB daytime and 20% exceeding 65 dB, levels that are intrusive or annoying to many (WHO, 1995). (Berger 2003:3)

In Malaysia, the Environment Quality Act 1974 indicates that "no person shall, unless licensed, emit or cause or permit to be emitted any noise greater in volume, intensity or quality in contravention of the acceptable conditions", and the offender may be fined not more than 1,000 ringgit or imprisoned for five years or both (CLR 2006, 26 Section 23). The acceptable conditions for 'noise pollution' (the term used in the act) is defined by the Minister upon the consultation of the Environment Quality Council. It is unclear how this act has been reinforced and what the formal "acceptable conditions" of noise pollution are at present against which legal action can be taken. The recommendations provided by the Department of Environment in Table 1, however, seemed ideal.

In view of the various dB levels set by different governments, it is therefore appropriate to determine that long hours of exposure above 55db are a level of concern and above 65dB, a level that will affect quality of life. Meanwhile, there is no literature traceable concerning the level of noise exposed to Malaysian public. Research has however shown that there is a high risk of hearing impairment among adolescents which is due to an overdose of noise exposure, as reported in research by Shargorodsky et al. (2010), Vogel et al. (2010, 2008) and Kochkin (2005). The lack of research done on environmental noise prompted the present paper.

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Table 1 Maximum permissible sound level (LAeq) by receiving land use for planning and new development (Air Division and Strategic Communications Division, Department of Environment Malaysia, October 2007)

Receiving Land Use Category	Day Time 7:00am–10:00pm	Night Time 10:00pm–7:00am
Noise Sensitive Areas, Low Density Residential, Institutional (School, Hospital), Worship Areas.	50 dB(A)	40 dB(A)
Suburban Residential (Medium Density) Areas, Public Spaces, Parks, Recreational Areas.	55 dB(A)	45 dB(A)
Urban Residential (High Density) Areas, Designated Mixed Development Areas (Residential–Commercial).	60 dB(A)	50 dB(A)
Commercial Business Zones.	65 dB(A)	55 dB(A)
Designated Industrial Zones.	70 dB(A)	60 dB(A)

The Concept of Soundscape and Music Education

The idea of using environmental sound in music education is not new. Soundscape, a concept made significant by R. Murray Schafer (1994/1977), a composer himself, in the 1970s, captures sounds in the manner of a panoramic photograph which "listens" to the environment as a whole rather than singling out a particular object from its background. Soundscape has since been applied in music education classrooms, and was often used as a means for creative music projects. The stream of creative music projects in education led by John Paynter (Paynter & Aston, 1970) has spread mainly among the advanced countries, as can be seen, for example, in Atsuko Yamazaki's (2010) report on the development of creative music making projects in Japan. It is useful to raise two principles which have been imparted into the field of music education following the application of soundscape in creative projects.

First, the scope of 'music' is enlarged so that music is not confined to songs and instrumental genres that are transmitted in a tradition, but also include sounds of nature, sounds in the environment, and eventually acoustic outcomes that occur in any situation through any medium, whether by intention or by chance. Second, the role of music education, among others, is to enhance the understanding of the surrounding environment, which will lead to higher awareness of relationships between self, society and nature. This is done especially through appreciating the sound (and music) that is present in places where students live. The application of soundscape in education remains but a small part in music education in schools in the advanced countries today. In Malaysia, however, the enlarged concept of music to encompass sound in the

environment in school music education is yet to be seen, except in a section of the pre-school syllabus (Chan & Kwan, 2010).

Analysis and Interpretation of Recorded Soundscape

Apart from being used as creative music projects in music education, the recording of soundscape itself has its appeals in environmental biology. The recording and analysis of soundscape is an emerging field of study that crosses over the disciplines of acoustics and biology, and is often carried out by researchers who are musicians themselves. The primary focus in the study of recorded soundscape is on the types of sound source. Scholars like Bernard L. "Bernie" Krause have provided useful terminology in identifying sound source, they are 1) geophony which refers to sound occurring as a result of natural phenomena like winds, river, earthquake; 2) biophony, sound produced by organisms like insects and birds as well as humans; and 3) anthropophony, man made sound, which can be further divided into subcategories like incidental anthropophony (sound of machinery operated by humans) and controlled anthropophony (intended to sound like music) (Krause, 2008). Analysis of recorded soundscapes by Malaysian researchers has just begun recently with Phyllis Toh (2014) applying the sound source category in analysing the soundscape of a housing area in Port Dickson, Malaysia.

The idea behind the categorisation of sound sources is consistent with musicians' concerns of the tone colour (timbre) and texture (sound layers) of musical sound. The interpretative components in soundscape recording analysis provides a way to link musical concepts to the reality of the natural environment. Bernard L. "Bernie" Krause maintains that in a habitat, the organisms have some kind of "agreement" among them when it comes to contributing to the soundscape. This is done as in an orchestra where each instrument is assigned with their parts, of which when played together, will produce a balanced picture of sound. Krause describes the sound patterns made by the organisms in the soundscape of nature as "distinctively partitioned, competing yet collaborating", and called this relationship as "aural interdependence of vocal organism". Krause further provoked the readers to ponder that the nature soundscape could be where humans obtain ideas to engage in polyphony music (Krause, 2008).

A Music Educationist's Framework to Approach Noise/Sound in Living Environment

The primary concern of music education is on the holistic growth of a person in all dimensions. A music education framework will naturally cover the items for general education as well as items that are specific to the subject of music. The basic principle of the framework presented here is to regard noise in the environment as of an equivalent nature with music, an entity that has structure and characters, and that this entity will affect or enhance the musical growth of a student. The main streams of philosophy of general music education have been considered in the process of formation of this framework, which include those based on experiential education by Dewey (1916, 1922), music education as human growth as advocated by Mursell (1934, 1948), and

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the later developments until today that acknowledge the multiple strands of music education that can be conveniently summarised as formal education, praxial education, education based on context and music education for utilitarian benefits as described by Reimer (2003). Upon this, the principles that emerged in relation to soundscape studies and music education, which were discussed in the previous section, were also taken into consideration in forming the framework.

A Music Educationist's Framework to Approach Noise/Sound in Living Environment has two lenses to conceive the matter of noise/sound in the environment: 1) It is the lens of perceiving noise/sound, which perceives the quality of noise/sound holistically in the way music is being perceived. This musical way to perceive noise in the environment will naturally cover not only the amplitude of the noise, but also the texture and other structural qualities of the noise. 2) It is the lens of impacting the students, in that it evaluates the effect of noise in the environment on the holistic growth of a student. Based on these two lenses, four key questions are formulated as a test to consider if the state of sound/noise in environment has become a problem for music education. The areas of consideration in which the four questions were made are included in brackets.

1. Does the amplitude level of noise exposure in the living environment pose a threat to the physical growth of a student? (Physical well-being)
2. Does the amplitude level of noise exposure in the living environment pose a threat to the quality of life of a student? (Conducive learning environment, mental well-being)
3. Does the texture of noise in the living environment enhance students' understanding of the nature and society surrounding them? (Contextual education, environment education)
4. Does the quality of noise exposure in the living environment enhance students' sensitivity in their awareness of sound and music? (Aesthetic education, development of senses, music appreciation)

Methods

The methods used in achieving the research objectives are a noise survey and soundscape recording, with brief analysis on the recorded outcome. The noise survey, in order to achieve sub objective 1, was carried out using a sound level meter application (A Studio Six Digital produced SPL Meter apps calibrated to an actual decibel meter) to determine the range of sound pressure level of some common locations in Malaysian daily life. The range of the sound pressure level identified through the noise survey gives evidence of noise levels to be compared with the standards issued by the authorities. Sub objective 2, which concerns the texture of sound, was achieved through a comparison of soundscape recordings of two contrasting locations, the rural and the urban. This was to determine how diversified the sound sources present in the living environment in Malaysia are. Soundscape recording was used for this purpose because of its ability to display the layers of sound in a visual format. A digital audio recorder and wave analysis software were used for the above stated purpose. In the discussion section,

the analysis outcome of the noise survey and soundscape recording will be reflected upon through the four questions formulated in the Music Educationist's Framework to Approach Noise/Sound in Living Environment to determine if the present state of noise environment is a problem for music education.

Results

Impression of Noise Exposure in the Malaysian Living Environment

Locations shown in Table 2 are by no means comprehensive, but are sufficient to give an impression of the level of noise experienced in common Malaysian lifestyles. One can further argue about the definition of what a Malaysian living environment may be, but items covered in this survey, such as inside a vehicle, in school, in the street market and the restaurant are common to Malaysian folk irrespective of the geographical areas of residence. During the measurement, it was ensured that no people were talking or making sounds directly near the sound level meter. The last two items were an exception as such requirement is hard to meet. A quick glance of the Table reveals that all items are above 55dB (A), which is a noise level that brings concern of noise pollution, as discussed in the literature review section, except for the first three items. The level of noise exposure in the Malaysian living environment is as below.

Noise in the Nature Environment in Malaysia

The prevalence of sound by an organism is the character of the nature environment in Malaysia, in other words, the natural surroundings in Malaysia are not quiet. Item 2 (Table 2) indicates a range of sound levels that hit a maximum level of 53dB (A). Similar locations can be found throughout housing areas in urban areas, meaning similar noise exposure in the natural environment is common to Malaysians. Much can be looked into for further research as to the change of sound level of the natural environment according to time and weather.

Situations in Indoor Rooms in Malaysia

The sound exposure in indoor rooms in Malaysia is characterised by the heavy usage of ceiling fans and air-conditioning units. Compared to a situation when no cooling device is used and the window is closed, which is 33 dB(A) as indicated in Item 1 of Table 2, a high speed ceiling fans marks 43-48 dB(A) (Item 3, Table 2) of background noise; and, an air conditioned room marks 50 dB(A) (Item 4, Table 2), in a situation before human talking takes place. Much can be scrutinised on the data as to the type of fans, type of air-conditioning unit and the room size. As an impression, however, the high level of background noise in indoor rooms in Malaysia is established, and can be verified easily by personal experience. High, in this context, refers to the situation that it is high as a background for conversations to take place. Exaggerated though it may seem, this high background noise in indoor rooms renders the learning environment non-conducive. First, it requires more effort to talk and listen, and in many places (in seminars and lectures, for example) it necessitates/tempts the use of microphones for the speaker, even in a room with 20 participants. Second, it goes against the cultivation

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of awareness of quietness, that is, to experience and to appreciate *pianissimo* and silence, which is essential to music education. Imagine the *ppp* passage of music being overcome by the sound of the air-conditioning unit!

Table 2 Sound Level Pressure on Selected Places in Selangor State

	Locations	SPL (dBA)	Time and Day	Conditions
1	Inside a closed room without fan and air conditioning	33	Not applicable	All windows and doors closed
2	Bush hill at Taman Desa Wangsa, Cheras	46-53	10:00pm Saturday	Soundscape of nature (insects, etc)
3	Inside a residential house, Cheras	43-48	Not applicable	High speed ceiling fan
4	Seminar room, UPM, Serdang	50	Not applicable	2 horse power air-con, high fan
5	School classroom corridor, SMK Bandar Damai Perdana, Cheras	60-70	12:30pm Friday	After school, not crowded
6	School canteen, SMK Bandar Damai Perdana, Cheras	75	12:20pm Friday	After school, not crowded
7	Bus stop, Persiaran Suasana, Taman Tun Hussein Onn, Cheras	69-75	11:00am Saturday	Four lane road with moderate amount of vehicles moving in slow speeds
8	Inside a car (Proton Wira) driving at slow speed	55-65	Not applicable	With air conditioning
9	Restaurant Weng Kee, Cheras Perdana	76-80	12:45pm Saturday	Crowded, around 60 people in 48 square metre area
10	Popular Bookstore, Jusco Cheras Selatan	55-60	12:10pm Saturday	Moderately crowded
11	Jusco Cheras Selatan Shopping Centre, Balakong	65-75	12:00pm Saturday	Not crowded.
12	*Pasar malam*, Taman Anggerik, Cheras Batu 10	72-89	10:00pm Saturday	The end of the night, not much visitors
13	Open House, Putra Heights, Subang	60-80	2:45pm Chinese New Year	About 40 guests, crowded

Noise Level in Schools

The Department of Environment of Malaysia categorises schools together with Noise Sensitive Areas and recommends a sound level of 50dB(A) during the Day Time (Table 2). The findings of this paper, as shown in Item 5 and 6 in Table 2 indicate that there

is a high possibility that public schools in Malaysia exceed the recommended noise level, hence affecting the learning process of the students. Worth mentioning is that the high level of noise, 60-70 dB(A) for a school corridor and an average of 75dB(A) for a school canteen, was measured in a situation where the locations were not crowded. Much research is needed to have detailed noise measurement conducted, and to look into the sound sources and causes of background noise. This need for further research is justified by the fact that students could be heavily impacted by the noise environment in school due to the long hours spent in school daily.

Noise Inside a Vehicle

The noise level recorded in Item 8 of Table 2 indicates that a person sitting in a car with air conditioning may experience noise levels of 55-65dB(A). This result is not representative, as more careful and thorough measurement is needed to reach any conclusion, but it is sufficient to raise concerns. This item is relevant due to the heavy dependence on personal car transportation in the Malaysian lifestyle. Periodical exposure to moderate levels of noise may not bring harm to a person, but the combination of several locations with noise in a day makes the exposure continuous.

Noise in Social Situations

Some common social situations in the Malaysian living environment are restaurant/ canteens (Item 9), shopping malls (Item 11), the street market (Item 12), and social gatherings during festive seasons (Item 13). All four items have exceeded the recommended noise limit by the Department of Environment of Malaysia which specifies 65dB(A) for Commercial Business Zone and 70dB(A) for Designated Industrial Zones for Day Time (Table 2). In other words, the social venues for Malaysians in their daily life could be noisier than industrial areas. The severity of the noise conditions for social situations in the Malaysian living environments is increased by the trend observed in the Malaysian lifestyle that depends heavily on eating out, visiting shopping malls, street markets, and is filled with the festive celebrations of many cultures all year around.

Impression of the Exposure of Noise Texture in the Malaysian Living Environment

By means of comparison, the soundscape of two contrasting locations are recorded and presented as sonograms (Figure 1) in order to determine the sound layers and sound sources that are present at the selected locations. The upper section of Figure 1 is an excerpt of 24 seconds recorded at a Malay traditional village located within the National Forest Reserve in Pahang State, a Bantal village of Ulu Tembeling area, at the time of 7:00am, 1997. The lower section of Figure 1 is a 28 second-long excerpt recorded at a middle-cost residential area of suburban Port Dickson, Bandar Dataran Segar at the time of 2:00pm, 2008.

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Noise Texture in Rural Areas

In the excerpt for Bantal village (Upper Section of Figure 1), more than three layers of the sounds of insects consistently occupy the frequency range between 4,000 to 8,000 hertz. Underneath this range, bird A, B, C and D, as well as the rooster, are filling up the different space in the sonogram, indicating their "complementary" relationship in both terms of frequency range and timing. The audio playback also presents the voice of each organism from different spatial locations (for example, bird C is heard as from 'behind' the hearer), just like the pan effect in studio production. When listened to properly, the soundscape is nonetheless music itself: having multipart intersection as in polyphony music; variety in timbre as in orchestration; and the effect of surround sound as heard during a symphony orchestra performance. The noise texture of this soundscape corresponds fully with Krause's interpretation of sounds of nature after he studied the soundscape of SEKI National Park.

> In biomes rich with the density and diversity of creature voices, organisms acoustically structure their signals in special relationships to one another, cooperative and/or competitive, much like instruments in an orchestra so that each one can be heard distinctly from another, thus reducing the chance of masking effects. Originally labeled the niche hypothesis, this partitioning of animal voices into temporal, frequency, and spatial niches provides indicators of habitat viability and certainly once inspired humans to realise music and language. (Krause 2008, p.73-74)

I later discovered that a small hillside in the urban area in Kuala Lumpur gave an equally rewarding listening experience, as in the soundscape of Kampung Bantal. This means that a rich soundscape of nature is actually accessible in many places in Malaysia.

Noise Texture in Urban Areas

In the excerpt for Bandar Dataran Segar (Lower Section of Figure 1), sound layers are less distinctive. There are mainly background sounds produced by vehicles and house renovation. There is also a lack of variety in terms of frequency range covered in the soundscape, where noise gathers at the lower end of the frequency spectrum. This monotonous noise texture represents the noise environment soundscape experienced by the Malaysians who reside in urban areas. It is the sound of machineries and tools, or what Krause called electromechanical sound of the anthrophony (man made sound), in contrast to the excerpt of Kampung Bantal, which is mainly biophony (sound of organism).

It goes beyond the scope of this paper to present the characters of soundscapes of rural and urban areas in Malaysia. A detailed analysis of soundscapes of a Bantal village, as representative of the sounds of a rural environment, is published as an exhibition catalogue under the title of "The Symphony of the Insects" (Chan & Jähnichen, 2013). A comprehensive account on the sound environment of urban residential areas in Malaysia, taking Bandar Dataran Segar as a case, is available as a Master of Science Thesis (Toh, 2014). The simple comparison

presented in this paper is, however, sufficient to bring out the contrast between the noise texture of the rural and urban areas in Malaysia. The rural areas have a rich and diversified presence of the sound of insects, birds and other organisms, with many intersecting and overlapping sound layers, while the urban areas' sound environment consists of mainly sound produced by human activities and machineries, with few sound layers and less variety in terms of sound intersection.

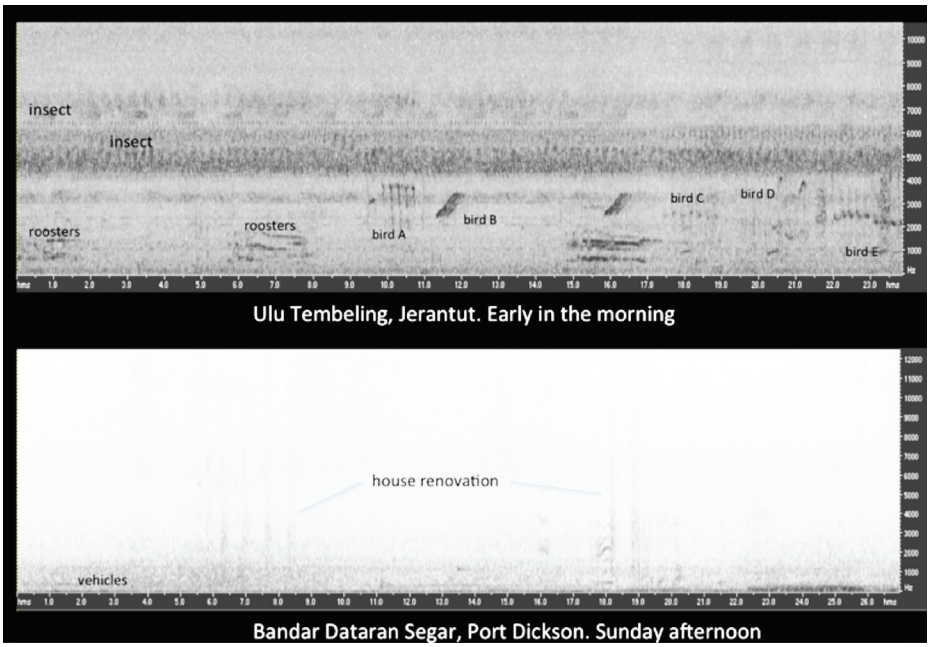

Figure 1 Comparison of Soundscape of Rural (Kampung Bantal, Ulu Tembeling) and Sub-urban (Bandar Dataran Segar, Port Dickson)

Discussion

The results presented are now reflected upon through the four questions listed in the Music Educationist's Framework to Approach Noise/Sound in Living Environment. Notwithstanding the results are mere impressions of the sound/noise in living environments, the purpose of this paper is to identify if these impressions are sufficient and convincing enough to have music educationists engage in further studies and new educational efforts with the students.

Does the amplitude level of noise exposure in the living environment pose a threat to the physical growth of a student?

It is unknown if noise exposure in living environments will affect the health of a student. A correlational study is necessary to answer this question, and it will have difficulties in terms of methodologies as the exact daily exposure to noise by school students varies greatly according to individuals.

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The presented data in can give a glimpse that the sound/noise exposure in the living environment may affect the life quality of a student. A school student in Malaysia spends a minimum of seven hours in school for at least five days per week. In addition, a typical Malaysian lifestyle depends heavily on the use of personal cars, frequent visits to shopping malls, street markets and restaurants. All the venues stated above recorded a noise level of above the level of concern, 55dB(A) and, except for personal vehicles, all the locations mentioned above also exceeded the level that affects the quality of life 65dB(A). At their peak, they exceeded the Department of Environment of Malaysia's recommendation for industrial zone which is 70dB(A). The answer to this question is Yes, especially when taking into consideration the high dB level recorded in the school environment. Even if the noise environment is unlikely to affect the physical health of a student, it may disturb the teaching and learning process in school.

Does the texture of noise exposure in the living environment enhance students' understandings of the nature and society surrounding them?

The answer to this question is probably 'no'. We have seen the contrasting difference between the soundscape of the rural and urban areas, and that the rural soundscape is rich in information in terms of sound layers, texture and sound sources, while the urban soundscape has little and monotonous information. As the Malaysian society in general is moving towards urban environments in its development, more and more Malaysian children are living in an urban noise environment which contains little information about the surroundings, especially information about nature.

Does the quality of noise exposure in the living environment enhance students' sensitivity to their awareness of sound and music?

The answer for this question is 'no'. Following the move of the Malaysian society towards the urban soundscape, students will have less chance to appreciate the diversified biophony that is present in nature. Another factor is the increased use of air conditioning units in Malaysia, recently made popular even in public school classrooms, which shut off the sound of the surroundings from entering the room. The usage of air conditioning units also creates monotonous background noise that may deprive students from experiencing and hence appreciating quietness, which is an essential part of musical expression.

Conclusion

By gathering the reflections of the results upon the four questions of the Framework, it is found that the sound/noise exposure in the Malaysian living environment may pose a threat to the quality of life of students; it does not enhance students' understanding of nature and the society surrounding them; and, it does not enhance students' sensitivity to their awareness of sound and music. Meanwhile, it is uncertain if the sound/noise exposure in the Malaysian living environment poses threats to students' health. In other words, the state of environmental noise affects students in the areas of quality of life, contextual education, environmental awareness, aesthetic education, and perhaps

health as well. In view of this, it is appropriate to consider sound/noise exposure in Malaysia as a problem for music educationists. This conclusion invites further research and new educational efforts, as discussed below.

Recommendations for Research and Teaching in Music Education

Many research initiatives can be derived from the results and discussion of this paper. Structured research into any specific aspects of the four questions listed in the Music Educationist's Framework to Approach Noise/Sound in Living Environment will contribute towards the body of knowledge in this area, which is at present in a situation of close to none. A pressing issue to be researched is the noise exposure level in public school and the risk of hearing impairment among the school students. From a more musical perspective, research into the application of the sound/noise environment as a source of information in music teaching and learning in school, is a new area to be explored. Cross-disciplinary education research that looks into the use of music and sound environments to cultivate students' awareness towards the environment will yield contributions towards cross-subject pedagogy. More importantly, with music educationists engaging in research about sound/noise environment and music education, it brings possibilities to reposition the role of music education in Malaysia, and may lead to greater awareness by the authorities and society on the integrative and holistic approach that music education can offer both in research and in the classroom. At the same time, music educators in schools and institutions can initiate new efforts in their teaching activities. We have seen that Malaysian lifestyles are moving towards a sound environment that is monotonous and with less information. Music educators can, through their creative efforts and problem solving skills, supplement this lack of environmental sound by guiding students to learn to listen and appreciate the soundscape of nature. An attitude of willingness to focus on hearing the environment can be cultivated among the students. Soundscape can be used in students' composition projects as well. From the perspective of health and quality of life, music teachers can take up the role of teaching students about hearing loss prevention.

Students should be made aware of the dangers of exposure to loud noise in their living environment and how to minimise the risk of hearing impairment when the use of sound devices is involved. Above all, an attitude that is sensitive towards sound/noise can only be cultivated through education. It is essential for school music teachers to know that the entire area of guiding students in handling sound and noise which affects their well-being and growth is normally not covered under the portfolio of any subject in the school curriculum. It is apt for music educators to pick up this role as the 'guardian of sound and hearing' of the students. This is because music educators are equipped with the ability to view the matter of sound and noise in an holistic manner. It is also strategic for music educators to pick up this enlarged scope of their career as music educators, as it will further enhance the significance of music education in public education, particularly by displaying how music education can help solve problems that affect multiple dimensions of a student. A suggested list of initiatives is below. In brackets are the areas of well-being or growth that are related to this initiative. A music teacher in school may:

1. Identify students with hearing difficulties in the classroom and recommend them for hearing tests and subsequent treatments. (Cause of learning difficulties)
2. Instill awareness of noise pollution and gives practical tips in hearing conservation (Health)
3. Lead students in learning to listen to the environment (Sensitivity towards sound and surroundings; social growth)
4. Lead students in appreciating the soundscape of different locations, especially the soundscape of nature (Awareness of environment; aesthetic education)
5. Lead students to apply recorded soundscapes, or ideas inspired by soundscapes, in creative music projects including composition and performance (Musical expression; awareness of environment)

This paper focuses on the task of problematising the noise environment from an action-based perspective rather than empirical data itself. Through providing the exploratory findings in this paper it is hoped that the potential of a cross-disciplinary approach to the topic of noise exposure can be identified. Taken as it is, the empirical data will not be sufficient to draw any conclusion on the issue studied. The data is, however, convincing enough for an educationist to 'take action', through modifying the scope and process of their research and practical teaching of music.

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Biography

Dr. Chan Cheong-Jan has interests in both the cultural and educational aspects of music. A jazz pianist, but trained as a composer and school music teacher at Kyoto University of Education, he went on to document Indung and Tarian Saba in Ulu Tembeling, and completed his doctoral thesis under Osamu Yamaguti by applying his framework of transcontextualisation in 2002. At his home institution, the Music Department of Universiti Putra Malaysia, he is currently training undergraduate jazz majors while supervising postgraduate research students.
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