

Library Architecture: Noise Controlling

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Abstract

The article deals with the evaluation of internal noise controlling strategies implemented in university libraries in Sri Lanka with special reference to Colombo, Kelaniya and Sri Jayawardanapura. The noise controlling is a very important factor in effective user services. The study found that the noise creation could be arisen due to the materials used in interior fabrication and as well as by reader behaviors. Therefore the possible noise disturbances could be avoided through proper planning of interior designing for a user expected noise less library.

Introduction

Pleasing library atmospheric condition is an important factor in libraries since it will be the gateway of the library users. Readers are seriously disturbed in several ways by other readers and the improper building construction.

Universities play a vital role towards the advancement of knowledge in the society. The lack of a properly designed library building and pleasing environment is a drawback in some universities in Sri Lanka in achieving this goal.

Aspect of environment in libraries could be defined as Lighting, Ventilation, and Noise controlling. Identifying the nature of the users and their needs is an important factor for preparing suitable library environment. University libraries differ in their concept and design as well as in their respective responsibilities, resources and clientele. They also differ in their nature and functions. Hence to safeguard the real concept of a library an organized library service within a well-planned interior sound controlling is required among the above aspects. Noise controlling is a very important factor in a library building.

There are two types of external and internal noises in libraries. In designing a new library building every effort must be made to eliminate both type of noises. Therefore, in selecting a site for the library care should be taken to locate it away from places such as the main roads, canteen and playgrounds, public areas as much as possible. Apart from locating the library in a quieter area, further action could be taken to minimize the amount of noise, which penetrates into the building arising from location, partitioning, flooring or roofing

Visual and aural disturbances could be identified in several libraries in different ways. Some soft noises may be an intolerable disturbance for the serious readers in a library. Therefore possible noises must be controlled through well design exteriors and interiors. Identifying the internal sound disturbances in university libraries is very significant that there are heavy reference users than in other type of libraries. This study will be focused on the inside noises in libraries and sound reduction strategies implemented by the individual university libraries.

The study focuses to identify the internal noises related to the library buildings in three universities in Sri Lanka. A well-planned library building is a prerequisite in a university for the use of the students, as well as the researchers and the staff.

To avoid the above professional ignorance as to the best type of sound controlling system required, librarians should acquire sufficient knowledge in sound controlling in library buildings. Library work experience supplements the professional knowledge in identifying and overcoming any practical difficulties. As such, librarians should read professional literature, observe the situations, attend courses and seminars, collect details, select the most applicable solution to any existing problem, seek advice from other sources, make visits to different library buildings and prepare solutions by following standards.

Significance of the Study

The study of noises in library buildings is very important, since the users being the undergraduate and postgraduate students, academic staff and researchers. The services of university library should be geared to their entire satisfaction.

The creation of a new library building is the result of co-operation of a whole team, the librarian and the architect playing major roles. Each will contribute his own professional skill as well as that of his staff and associates. The librarian will have to play the role of a client on behalf of twenty years of future users, which is a difficult task. This study will reveal the areas to be considered when planning a library building with due consideration to existing sound difficulties.

Libraries are open to disturb once by both external and internal noises. The findings of the study on the possible noises inside a library will serve librarians as well as library personnel in Sri Lanka to get some ideas and effects when planning sound controlling in libraries. Hence the study will attempt to identify the existing difficulties as well as the organizing processes. The main significance of this study is to be a guideline for future librarians when need sound controlling.

Objectives of the Study

The study attempted to identify the current problems created by internal noises in libraries today and to examine the quality and the nature of the university library buildings in Sri Lanka in respect of noise controlling.

As such, objectives of this research attempts to ascertain the factors which are important in noise controlling in a library, mindful of the requirements of users and their levels of satisfaction and expectations. The preparation of a noise less proper building as a responsibility of the librarian and finally propose solutions for future librarians

Methodology of the Study

The university libraries of Colombo, Kelaniya and Sri Jayewardenepura were selected as samples of the study. The survey research method has been used as the main method of gathering data pertaining to the study. In addition, observations and primary and secondary information search were used in collecting relevant data and information.

The oldest library building of the three, the University of Kelaniya was commissioned in late 1977, followed by University of Sri Jayewardenepura in 1986 and the University of Colombo in 1999. Therefore, these buildings were constructed in a span of three decades.

In assessing the user requirements and their opinions, the present users, which included the undergraduate students, were selected as the study population.

Sample

All first and final year internal students in each university formed the population of the sample.

Stratified sampling technique was used with the aim of higher-level accuracy in sampling. Since there was a larger study population, the sample size was restricted obtaining 5 % of the total population in each sub category.

Table - Population and Sample

University Faculty	Colombo				Kelaniya				Jayewardenepura			
	1 st Yea r	Sa mp le	Fin al Ye ar	Sa mp le	1 st Yea r	Sa mp le	Fina l Yea r	Sa mp le	1 st Yea r	Sa mp le	Fina l Yea r	Sa mp le
Arts/ Humanities	557	28	17 6	8	130 3	65	118 2	59	505	25	549	27
Com & Mgt.	277	14	27 0	13	793	40	396	20	788	39	757	37
Science	**	**	**	**	621	31	348	17	194	9	200	10
Law	393	20	19 5	10	**	**	**	**	**	**	**	**
Medicine	**	**	**	**	**	**	**	**	159	8	148	7
Total	122 7	61	64 1	32	271 7	13 5	192 6	96	164 6	81	165 4	81

** - Indicate non-selected faculties

Questionnaires were the main information-gathering tool.

Response Rate to the Questionnaire According to the Universities

The response rate varied among individual Universities. Out of the total number of questionnaires received, Colombo recorded the highest percentage of 100%, while 73.07% by university of Sri Jayewardenepura and 72.35% by the University of Kelaniya.

The distributions of respondents of five faculties in the three universities varied. The population included those within the Faculties of (Arts/Humanities/ Social Science), Commerce/Management, Science, Medicine and Law at the selected universities. This population either used the central library or the faculty libraries within the central library. These students

were classified according to the available faculty levels in each university. The Faculty of Arts was considered to include the faculties of Humanities and Social Sciences since similar subjects are conducted under those faculties at the three universities.

Two hypotheses were taken into consideration for evaluating the strength of the responses.

There is a direct relationship in the usage of the three university libraries among the students of sample. Here the researcher has considered the first three choices of the respondents. If 80% of the respondents visit the library daily, 2-3 days per week or once a week, it could be considered that sample has a fair knowledge to evaluate the library buildings with their experience.

If 80% of the above frequent library users considered the following three library facilities as important and extremely important, it also could be considered that their attitudes will be highly acceptable.

1. For reference
2. To borrow books
3. To read periodicals

The respondents of this survey were categorized systematically to elicit the most appropriate answers for the study. The respondents in this survey were tested by two questions to assure whether they were regular users.

Purpose of library visits

One question was used to get the nature and extent of visits to the libraries in the three universities. A question was used as significant keys to evaluate the purposes of library visits, such as

1. Extremely important
2. Important
3. Not important

The following figure presents the purpose of visits by the respondents of each university.

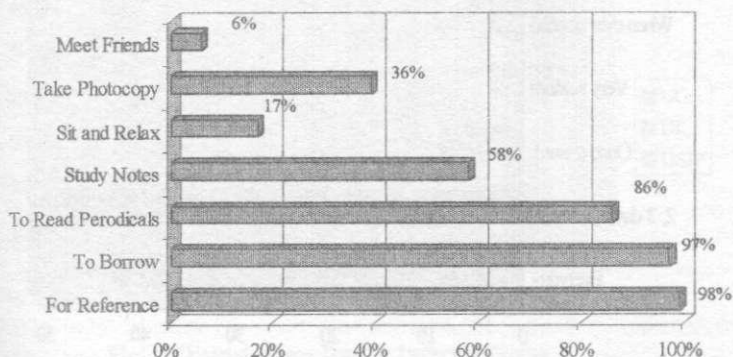


Fig. - Importance in Visiting Library

Significance of the purpose in visiting the library helps to find the behavior of the respondents. The results obtained through these questionnaires have confirmed that most of the students use library for many reasons.

According to the above chart, the first three purposes were considered. Most of the respondents have selected "For references" "To borrow books" and "To read periodicals" as extremely important and important respectively.

Studying their notes too has become a relevant factor to 58.19% of the respondents of the sample. Since they visit the library to study their own notes, they can't be considered as being aware of library purposes as required in this survey.

Hence the received data could be considered as highly acceptable and very effective in this survey.

In addition to the purposes of library visits, the respondents were questioned about the frequency of their visits.

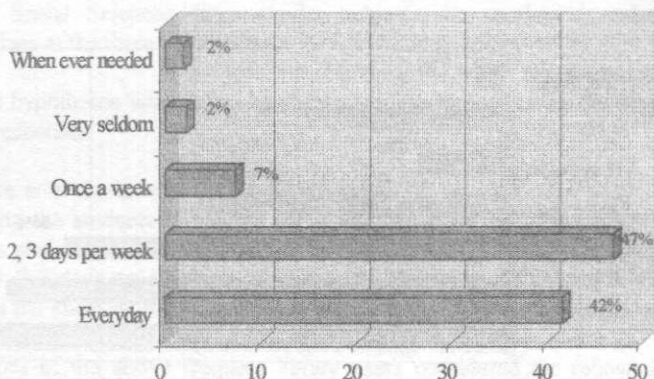


Fig. Extent of Library Use

According to the above table, 42% of the respondents visit the library almost daily and 47% twice or thrice a week and hence at a satisfactory level. Therefore the purposes of library visit and the frequency confirm the accuracy and the quality of the respondents.

Internal noise

Internal noise was divided into two broad categories such as frictional and mechanical noise, which is further sub, divided into seven sub categories as divided by Thompson, Godfrey

1. Frictional noise
 - a. Students' conversation (SC)
 - b. Chair scraping (CS)
 - c. Fluorescent bulbs (FB)
 - d. Impact of heels on hard surfaces (IH)
2. Mechanical noise
 - a. Typewriter (TYP)
 - b. Telephones, Mobile phones (TEL)
 - c. Book trolleys (BT)

To identify internal noises, the respondents were asked to rank their experience

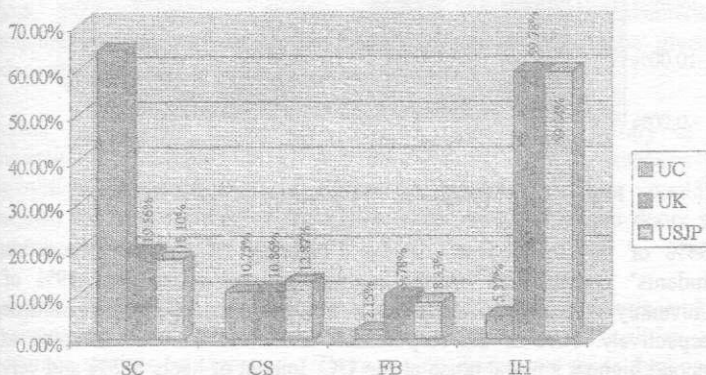


Fig. – Disturbances Due to Internal Noise

Almost all the students were disturbed by the first four internal noises. There were no mechanical sound disturbances

The descending order of the level of internal noise felt by students is as follows,

1. Impact of heels on hard surface 47.43%
2. Student conversation 29.33%
3. Chair scraping 11.49%
4. Fluorescent bulbs 7.57%

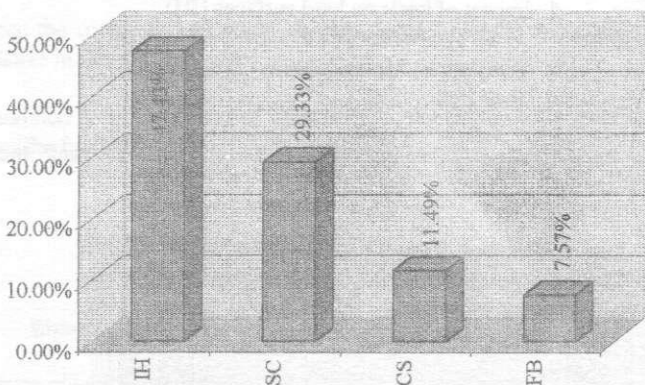


Fig. – Total Response in Common Divided by Ranks

64% of the respondents of the University of Colombo have marked students' conversation as the highest internal sound and 19% of the University of Kelaniya and 18% of the university of Sri Jayewardenepura respectively. 10% of the respondents have marked chair scraping as the second highest internal noise at the UC. Impact of heels is 5% and very few in numbers. The smooth rubber carpeted flooring controlled noise created by heels. The noise created by fluorescent bulbs, which is 2%, is lower than the others. 60% of the respondents of the UK have marked " 1 " for impact of heels as the major disturbance of their library. Impact of heels is increased by the hard flooring surface of cement. Other noises are categorized as student conversation (19%) Chair scraping (10%) and Fluorescent bulbs (10%) respectively.

Majority of the respondents of USJP (60%) identified their main internal noise as the impact of heels which is created by the tiled and cement flooring, students' conversation by 18 %, chair scraping by 13 % and fluorescent bulbs by 8% constitute the rest respectively.

Finding: *Impact of heels on hard surface and students conversation were considered by students as the main internal disturbance factors.*

Results of Research

Internal noise may arise from the materials used in construction as well as by readers' behavior. Reader reaction in a library should be ethically controlled. The study found that student conversation, frictional noise (chair-scraping, weaker ballast of fluorescent tubes arrangements, impact of heels on hard surface) mechanical noises (book binding, typewriters, telephone equipment's, book trolleys, noise of ceilings fans, opening and closing doors, turnstile entrance system, moving of portable maintenance equipment) as internal noises. Considerable attention should be given to reduce the above noises as far as possible.

Student conversation is the main internal noise in the library of the University of Colombo. To prevent such habits, signs, orientations and supervision should be used to inform students. Construction should be designed for easy supervision through soundproof glassing and doors with immediate closing.

Evidence of student conversation in the Universities of Kelaniya and Sri Jayewardenepura is very few. Lack of discussion room facilities may encourage student conversation. There are no discussion room facilities in the universities though the student's demand is high. More than half of the library visitors makes their visits to the library for studying their own notes. Therefore every university library should be designed to include a discussion room for studying their notes or existing room should be converted as a discussion room.

Arrangement of individual seating accommodation may reduce internal noise to a certain extent as preferred by readers by disconnecting visual and oral connection among students. Therefore every library should be minimized students conversation by following the above suggestions. The

reading areas must be designed away from loud talking areas such as non-
assainable space (lobbies, staircases)

Students of the University of Kelaniya and Sri Jayewardenepura have
marked impact of heels as the highest disturbance in their libraries. Cement
flooring creates higher rate of heel sounds. Therefore the floor of the
reading and surrounding areas should be covered with smooth flooring or
sound-proofing rubber carpeting or any kind of rubber matting. Chair
scraping is a habitual action in these libraries. Rubber flooring is the best
answer for preventing noise caused by chair scraping and it was well proved
by the University of Colombo with low rate of impact of heels and chair
scraping. Humming sound of florescent tubes due to weaker ballast disturbs
reader convenience and makes them irritable. Therefore considerable
attention should be given to regular maintenance of library lighting.
Libraries should not neglect any of these recommendations when controlling
internal noise.

The most suitable of the following noise reduction coefficient materials
should be used for flooring, walls and ceilings. If the coefficient is high, the
noise absorbed. (NRC of 0.95 means 95% of the noise is absorbed.)

Walls	NRC
Glass - Windows	0.15
Gypsum board 1/2inch	0.05
Plaster or brick or lath	0.05
Marble or glazed tile	0.00
Wood	0.10
Carpet, Fiberboard	0.70
Floor	NRC
Concert, Terrazzo, Marble or Glass	0.00
Wood	0.10
Carpet on concert	0.30
Carpet on wood floor	0.05
Carpet Rubber	0.55

Ceiling	NRC
Concert	0.00
Plaster or Lath	0.50
Suspend acoustical tile	0.95
Cellulose fiber on concert	0.75

Conclusion

Data collected for this study revealed that there are several internal noise disturbances in university libraries in Sri Lanka. Student conversation and sound arising from hard surfaces on flooring are prominent. The materials used in external and internal construction could regulate these disturbances. Therefore considerable attention must be given at the planning stage of the building. Discussion room facilities, isolated non-assailable spaces, outlets for students gatherings, individual seating, more visual arrangements, can be implemented as a matter to be resolved later.

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