LIBRARY TRANSFORMATION: NOISE LEVEL AND HIERARCHY OF LIBRARY COMMUNITY NEED IN MALAYSIA ACADEMIC LIBRARY

BY

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ABSTRACT

The purpose of this study is to identify cultural mismatches between users in the operation of learning spaces to improve understanding of user preferences in physical learning environments in the context of current educational trends in Malaysia's physical academic library learning spaces in the era of Education 4.0. The research has examined the relationships between the learning space attributes of users' activities, sociability, and comfort image, and the user preferences, noise management practices, users' behavior, and noise levels of 40-55 decibels (dB), as it is believed that these relationships will contribute to the highest level of the hierarchy of library users' needs, which is community as the library. This study uses an explanatory sequential mixed design research methodology, collecting data through a quantitative phase, followed by qualitative data collection, with the final phase involving linking the data obtained from these two strands of research. A true experimental and questionnaire methods study was conducted to collect quantitative data from 384 library users from higher education institutions using simple random sampling. The data was then analyzed using SPSS to test hypotheses using paired samples t-tests, one-way ANOVA, two-way repeated measures ANOVA, and descriptive analyses. Qualitative data were obtained from eight academic librarians in Malaysia using snowball sampling and semi-structured Zoom interviews. The data were then analyzed using Atlas.ti for coding analysis. Quantitative findings revealed that noise levels below 50 decibels had minimal impact on user learning. The interplay between user preferences, automated noise control efficacy, and collaborative study desirability in common areas was evident. Over half expressed a preference for and frequent use of these spaces, with 57% planning to recommend them for collaborative activities. Automated noise control systems were deemed effective for reducing noise by 65% of respondents. A significant majority (67.4%) believed that the library required service transformation. A notable interaction between modern learning design and noise detection machines was observed, influencing user learning abilities. These quantitative findings served as a catalyst for qualitative research with librarians, resulting in five pivotal insights. First, it emphasized the connection between Education 4.0 and contemporary collaborative learning environments. Additionally, the study suggested the creation of more learning spaces in common areas with noise levels of below than 50dB in collaborative activity areas to fulfill the strong need for collaborative learning spaces among students. Furthermore, the study found that the use of comfort and noise detector machines was positively correlated with improved learning outcomes. The findings also revealed a connection between users' preference to quantify noise levels and reduce human situational control in learning environments. Finally, the study emphasized the importance of creating welcoming and accessible spaces for students, as evidenced by the relationship between library image and user behaviour. In conclusion, this study has provided valuable insights into the changing patterns of user behaviour in physical academic library learning spaces. The findings of this study have implications for the design and management of these spaces in order to meet the needs of users and facilitate effective learning.

خلاصة البحث

الغرض من هذه الدراسة هو تحديد الفجوات الثقافية بين المستخدمين في تشغيل مساحات التعلم لتحسين فهم تفضيلات المستخدمين في البيئات التعليمية الفيزيائية في سياق الاتجاهات التعليمية الحالية في مساحات المكتبات الأكاديمية الفيزيائية في ماليزيا في عصر التعليم 4.0. لقد بحثت الدراسة في العلاقات بين خصائص مساحة التعلم من حيث أنشطة المستخدمين، والتواصل الاجتماعي، وصورة الراحة، وتفضيلات المستخدمين، وممارسات إدارة الضوضاء، وسلوكيات المستخدمين، ومستويات الضوضاء التي تتراوح بين 40–55 ديسيبل (دب)، حيث يُعتقد أن هذه العلاقات تساهم في أعلى مستوى من هرم احتياجات مستخدمي المكتبة، وهو المجتمع كمكتبة. تستخدم هذه الدراسة منهجية بحثية مختلطة بتصميم تتابعي تفسيري، حيث يتم جمع البيانات من خلال مرحلة كمية، تليها مرحلة جمع البيانات النوعية، مع المرحلة النهائية التي تتضمن ربط البيانات التي تم الحصول عليها من هذين الجانبين من البحث. تم إجراء دراسة باستخدام طرق التجارب الحقيقية والاستبيانات لجمع البيانات الكمية من 384 مستخدمًا للمكتبة من مؤسسات التعليم العالي باستخدام العينة العشوائية البسيطة. ثم تم تحليل البيانات باستخدام SPSS لاختبار الفرضيات باستخدام اختبارات t للعينات المزدوجة، وتحليل التباين الأحادي، وتحليل التباين الثنائي المكرر، والتحليلات الوصفية. تم الحصول على البيانات النوعية من ثمانية أمناء مكتبات أكاديميين في ماليزيا باستخدام طريقة العينة الثلجية والمقابلات شبه المنظمة عبر زووم. ثم تم تحليل البيانات باستخدام Atlas.ti لتحليل الترميز. كشفت النتائج الكمية أن مستويات الضوضاء التي تقل عن 50 ديسيبل كان لها تأثير ضئيل على تعلم المستخدمين. كان التفاعل بين تفضيلات المستخدمين، وفعالية التحكم التلقائي في الضوضاء، ورغبة الدراسة التعاونية في المناطق المشتركة واضحًا. أعرب أكثر من نصف المشاركين عن تفضيلهم واستخدامهم المتكرر لهذه المساحات، حيث يخطط 57% منهم التوصية بها للأنشطة التعاونية. اعتُبرت أنظمة التحكم في الضوضاء الآلية فعالة في تقليل الضوضاء من قبل 65% من المشاركين. اعتقدت الأغلبية الساحقة (67.4%) أن المكتبة بحاجة إلى تحويل في الخدمة. تمت ملاحظة تفاعل ملحوظ بين تصميم التعلم الحديث وآلات كشف الضوضاء، مما أثر على قدرات التعلم لدى المستخدمين. كانت هذه النتائج الكمية مثابة حافز للبحث النوعي مع أمناء المكتبات، مما أسفر عن خمس رؤى محورية. أولاً، أكدت على العلاقة بين التعلم 4.0 وبيئات التعلم التعاونية المعاصرة. بالإضافة إلى ذلك، اقترحت الدراسة إنشاء المزيد من مساحات التعلم في المناطق المشتركة بمستويات ضوضاء أقل من 50 ديسيبل في مناطق الأنشطة التعاونية لتلبية الحاجة الملحة لمساحات التعلم التعاونية بين الطلاب. علاوة على ذلك، وجدت الدراسة أن استخدام أجهزة كشف الراحة والضوضاء كان مرتبطًا بشكل إيجابي بتحسين نتائج التعلم. كشفت النتائج أيضًا عن وجود علاقة بين تفضيل المستخدمين لقياس مستويات الضوضاء وتقليل السيطرة البشرية على الأصوات في بيئات التعلم. أخيرًا، أكدت الدراسة على أهمية إنشاء مساحات مرحبة وملائمة للطلاب، كما يتضح من العلاقة بين صورة المكتبة وسلوك المستخدمين. في الختام، قدمت هذه الدراسة رؤى قيمة حول الأنماط التغيرية لسلوك المستخدمين في المساحات التعليمية للمكتبات الأكاديمية الفيزيائية. تتمتع نتائج هذه الدراسة بتداعيات على تصميم وإدارة هذه المساحات من أجل تلبية احتياجات المستخدمين وتسهيل التعلم الفعال.

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I dedicate this thesis to my mother Mdm. Leong Fong Min

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LIST OF ABBREVIATIONS

PNM	Perpustakaan Negara Malaysia
KPI	Key Performance Indicators
Db	Decibel
ANOVA	Analysis of Variance
SD	Standard Deviation
SRS	Simple random sampling

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The academic library industry in Malaysia is facing challenges in adapting to the cultural changes associated with the revolution in education, industry, and libraries. Mkhathali (2019) has highlighted the impact of the Industrial Revolution 4 (IR4) on academic libraries. In conjunction with IR4, the Ministry of Higher Education (MOHE) has established the parameters of Education 4.0, and the impact of Education 4.0 has influenced the role of Library 4.0.

In 2018, Malaysia's higher education system launched a new initiative, Education 4.0, with a focus on equipping students with critical thinking, problem-solving, and teamwork skills. These skills are essential for success in the modern workplace, especially in the context of the Fourth Industrial Revolution. (Higher Education Malaysia, 2018). Education 4.0 highlights the necessity of redesigning learning spaces to cater to the diverse learning styles of users, just as academic libraries are designed to support the learning needs of students on campus. The goal of the redesign is to encourage a change to new learning methods that focus on students learning by themselves, with their classmates, and using technology.

The development of Library 4.0 is closely tied to the principles of Education 4.0. Flexible learning environments, collaboration, and technology integration are essential for creating dynamic and engaging learning spaces that support collaborative learning experiences and foster innovation and creativity. This transformation of physical learning spaces is a key component of the overall shift towards Education 4.0. (Mkhathali, N. (2019).

To engage with Education 4.0, Library 4.0 must focus on creating a learning environment that fosters social skills and instills the right values of thinking and practice among young Malaysians. Appropriate Library 4.0 learning spaces that can be implemented in library services include maker spaces and infinite creative spaces (Noh & Younghee, 2015). Users in libraries need an infinite learning space in their

learning process. This is a space where learning can happen through playing, exploring, and making things, and a place where emotional skills can be developed and real-world connections can be made through meeting people.

The advent of Education 4.0 has led to a shift in the educational landscape, with students now being expected to be critical thinkers and problem solvers who can work collaboratively to solve complex problems. This has led to a rapid evolution of the traditional role of libraries, as they are now increasingly being seen as essential spaces for learning and collaboration. However, academic libraries may face challenges in keeping up with the changing needs of their users, as well as with the cultural advancements that are taking place in the wider world.

One of the most pressing challenges facing Malaysian academic libraries is the need to provide effective physical learning spaces that support collaborative and social learning methods. Traditional library spaces, which are designed for quiet individual study, may not be suitable for collaborative activities. As a result, academic libraries must provide dedicated discussion spaces that can accommodate group discussions, debates, and other collaborative learning activities. These spaces should be designed to facilitate interaction and engagement among students, with comfortable seating arrangements, flexible furniture, and ample space for group work.

The introduction of innovative learning cultures in physical library spaces has challenged the daily operations of academic libraries in Malaysia, where noise problems in learning spaces are becoming increasingly prevalent. Traditional library spaces were designed to be quiet, providing an environment conducive to individual study and research. However, the emphasis on collaborative learning and social activities in Education 4.0 has led to an increase in noise levels. This poses a challenge for academic libraries, as they need to strike a balance between quiet study spaces and collaborative learning spaces.

The noise problem is not limited to students working collaboratively. It can also arise from the use of modern technology and hardware in the library. For example, group workspaces, Zoom meetings, Google Meet, Discord, and other applications may require the use of audio and video equipment, which can create noise that disturbs other library users.

To address this issue, academic libraries need to implement noise management strategies that balance the needs of different users. These strategies could include designating quiet zones in the library, providing soundproof booths or pods for students who need to work in a quiet environment, educating library users about noise pollution and how to minimize it, and investing in noise-canceling headphones or earplugs for library users

The noise problem in academic libraries is not just a matter of inconvenience. A study by Currier and Wilhelm (2017) found that the library has acquired a negative reputation among students due to noise issues. High levels of noise can have a significant impact on learning outcomes. Distractions caused by noise can reduce concentration and increase stress levels, which can harm students' academic performance and overall well-being.

The traditional library space, which was once synonymous with a tranquil study environment, is no longer the case in the present day. The issue of noise in physical learning spaces and Education 4.0 is related to the practice of silent study in libraries. In this paper, the researcher seeks to determine the areas of transformation that should be prioritized to create a user-centered and conducive learning environment for the new millennium.

1.2 PROBLEM STATEMENT

The dynamic transformations within the educational milieu, epitomized by the integration of IR4, Education4, and Library 4.0, have induced a paradigm shift in student learning modalities and collaborative practices. This transition has imposed considerable challenges upon Malaysian academic libraries, often ill-equipped to furnish requisite physical learning spaces commensurate with these evolving pedagogical paradigms. As noted by Ahmad (2023), the lack of research on Malaysian libraries presents a significant challenge for future planning. By conducting in-depth research on the impact of noise on learning, optimal design elements, and tailored guidelines, Malaysian libraries can minimize misalignment between their services and user needs. This will ultimately contribute to the creation of user-centered academic library environments.

The advent of the fourth industrial revolution (IR4), Education 4.0, and Library 4.0 has engendered marked sociocultural transformations in students' collaborative learning approaches, underscoring the imperative for academic libraries to recalibrate their spatial configurations. Traditionally conceived as sanctuaries for solitary study, libraries are compelled to metamorphose into more flexible and adaptable environments to cater to the burgeoning demands of collaborative and social learning. Alas, this evolution encounters financial constraints and resource limitations, impeding substantial infrastructural renovations.

The environmental ramifications of learning spaces, especially concerning their physical and functional dimensions, remain inadequately explored, as posited by Kim and Yang (2022). A crucial imperative emerges for clear and standardized guidelines and policies governing the transformation of collaborative learning spaces within Malaysian academic libraries. The lack of sophisticated analytical instruments poses a significant challenge for libraries in Malaysia, hindering their ability to effectively assess the renovation and improvement needs of their aging facilities. This, in turn, compounds the difficulties encountered by library decision-makers (Ahmad, 2023). Stringent and equitable enforcement of these guidelines is essential for cultivating a conducive and respectful learning milieu. The establishment of an environment fostering collaboration and community engagement becomes paramount, nurturing essential skills such as creativity, innovation, and critical thinking crucial for 21st-century success.

The exigency for administrator and librarian training in space evaluation poses a formidable challenge, hindering the realignment of library spaces for non-traditional purposes. Insufficient information and guidance regarding necessary renovations in aging library facilities further exacerbate the predicament. The absence of effective analytical tools for identifying requisite renovations and enhancements in antiquated library structures compounds the challenges faced by decision-makers in Malaysian libraries. Analogously, the library sector grapples with obstacles in assimilating cultural advancements associated with the educational revolution, particularly within physical learning environments where user learning patterns intersect.

The lack of substantial research exploring the intersection of culture, innovation, and collaborative learning environments hinders the development of clear,

relevant, and universally applicable guidelines and policies. This deficiency indicates a potential mismatch between library management and the evolving needs of users, posing a significant challenge. Consequently, the research objective crystallizes around the formulation of a comprehensive checklist delineating potential enhancements to learning spaces for optimal user benefits.

The rationale behind this research option stems from four primary considerations. Foremost among them is the ambiguity surrounding the preservation of a serene and agreeable learning ambiance, pivotal for conveying a positive impression of Education 4.0. The challenge faced by libraries lies in enhancing their physical services, bridging the librarian-user divide, while concurrently acknowledging the sanctity of silence. Contemporary libraries, in accordance with the principles of Education 4.0, are increasingly prioritizing the cultivation of soft skills through the provision of dedicated spaces for collaborative activities and critical thinking. (Christoffersen et al., 2021). Yet, the valorization of silence persists, prompting an exploration into the potential alteration of space design and themes to accommodate social activities without compromising the reverence for quietude.

Secondary to this is the dearth of expertise and information available to library decision-makers, impeding the identification of requisite updates for older library facilities. Inadequate training among administrators and librarians in assessing space requirements manifests as a stumbling block in repurposing library spaces for non-traditional uses. The ensuing discord perpetuates the struggle of university libraries to keep pace with the swiftly evolving learning approaches in 21st-century pedagogy. The research endeavors to scrutinize the rift between librarians and users in pinpointing areas for improvement in learning spaces.

The persistent issue of noise complaints within library learning spaces, as reported by Vance (2018), constitutes the third impetus for this research. Changing learning habits among library users, coupled with a lack of awareness regarding appropriate noise levels, contribute to this predicament. To address this, it becomes imperative to quantitatively measure noise levels across different library zones, thereby mitigating user complaints. Although noise is inherently subjective, it remains quantifiable. Current standards classify a library as very quiet (<40 decibels, dB) (Snyder Scott, 2000), yet this benchmark may no longer be universally applicable.

The research endeavors to ascertain the suitability of a noise level range of 40dB to 48.9dB for implementation in academic libraries in Malaysia, thereby comprehending user noise preferences and formulating solutions to optimize the learning environment.

The fourth rationale pertains to the absence of lucid guidelines and policies for the transformation of physical collaborative learning spaces in Malaysian academic libraries. The imperative here is to ensure equitable and consistent enforcement for all users, aligning with Logan and Everall's (2019) hierarchy of library user needs. Although the physical space is deemed fundamental, safety, comfort, and a sense of belonging emerge as pivotal criteria. The silent value in the learning environment, however, impedes the realization of this sense of belonging. Thus, the research delves into exploring the perceptions of comfort and a sense of belonging, unraveling their nuanced associations with Education 4.0 and their potential enhancement to ameliorate the overall learning experience.

Consequently, Malaysian academic libraries necessitate additional empirical data to enhance the learning spaces they offer, aligning with the evolving needs of their user base. This research thus aspires to pioneer cultural innovations in the realm of physical learning spaces, delineating which transformations are imperative in light of the educational, industrial, and library revolutions to harmonize with user requisites in these physical domains. The research assumes critical significance in engendering an ambience conducive to learning, cultivating respectfulness among users, and precluding disruptive activities that may impede the library's core mission and services.

1.3 RESEARCH QUESTIONS

This study aims to assess the position of noise-related concerns within the hierarchy of attributes associated with library learning spaces. It seeks to identify any noteworthy links between the way librarians oversee these spaces and how users experience them. The research also seeks to determine whether users prefer the traditional emphasis on quietness in physical library services, or whether they would welcome a shift toward social hubs. To achieve these objectives, the study will address the following queries:

1. What are the optimal design elements for academic library learning spaces that cater to user preferences while mitigating discourse noise-induced distractions, and how does the relationship between learning ability and preferred noise levels (40dB, 45dB, 50dB, 55dB) influence these design considerations?
2. What are the key gaps between the current state of learning spaces in Malaysian academic libraries and the changing needs and preferences of library users, and how can these gaps be addressed through redesign efforts to influence user behavior and improve library management practices?
3. What are the evidence-based challenges and implications of transforming learning spaces in academic libraries in Malaysia to meet the needs of users and library management in terms of learning activities, sociability, comfort, and noise levels, in line with the current learning trends in Malaysian education system?

1.4 RESEARCH AIM AND OBJECTIVES

This research aims to improve understanding of user preferences for physical learning environments in the context of current educational trends in Malaysia. Ultimately, this research seeks to inform library practices for managing noise levels in learning spaces where social activities are becoming increasingly common. The research will also compare and evaluate the range of noise levels that are acceptable to users without compromising their ability to learn.

The following objectives have been formulated to attain the aim:

4. To explore the effects of noise levels on user learning, abilities, and behavior in Malaysian academic library learning spaces, and to determine the optimal design elements that minimize noise-induced distractions while accommodating the diverse preferences of users, considering the relationship between learning ability and preferred noise levels.

5. To identify and analyze the discrepancies between the current state of learning spaces in Malaysian academic libraries and the evolving needs and preferences of library users, and to explore how these discrepancies can be addressed through redesign efforts to positively influence user behavior and enhance library management practices.

6. To develop evidence-based recommendations for the transformation of learning spaces in academic libraries in Malaysia, taking into account the needs of users and the capabilities of library management.

1.5 NATURAL ATTRIBUTES OF LIBRARY LEARNING SPACES

Cunningham and Susanne Tabur (2012) developed a model of learning space attributes hierarchy that categorizes the needs of library learning space into four categories: access and linkages, users and activities, sociability, and comfort and image. The model provides a detailed explanation of various physical requirements for library learning spaces. The four categories are as follows:

- Access and linkages: This category includes the physical features that allow users to easily access and move around the library learning space. This includes features such as signage, pathways, and furniture.
- Users and activities: This category includes the physical features that support the different activities that users engage in in the library learning space. This includes features such as tables, chairs, and power outlets.
- Sociability: This category includes the physical features that promote social interaction among users in the library learning space. This includes features such as group study rooms, coffee shops, and breakout areas.
- Comfort and image: This category includes the physical features that create a comfortable and inviting environment in the library learning space. This includes features such as lighting, temperature, and noise levels.

Logan and Everall (2019) developed a model of the hierarchy of library user needs, which highlights the physical space as the fundamental requirement. The lower three tiers of the hierarchy are closely connected to the physical work environment and users' relationships, including interpersonal relationships and library policies. The hierarchy stresses the importance of safety, comfort, and a sense of belonging for library users. The current library learning space is designed around the "One-stop shop" concept, providing a quiet area for studying, a discussion area, and a fun corner for playing games.

The learning area in the library caters to the requirements of its users by providing a space for cultural mediation, enhancing users' literacy experiences, and supporting digital education. As Jochumsen et al. (2017) stated, this is achieved through human interaction, personal participation, creativity, and innovation.

Malaysia's education system has been through some major upgrades, all geared towards churning out top-notch individuals for the nation. With the Fourth Industrial Revolution (4IR) shaking things up, academic libraries in Malaysia are hustling to keep up with the evolving needs of their users. The Malaysian Higher Education Programmes (MyHE) 4.0 is all about moving from basic thinking skills to the more advanced ones in the learning game. This switch-up is causing a ripple effect, changing how library users behave and their study habits. Libraries have been recognized as essential resources for supporting academic development in the Malaysian Education Development Plan. They play a critical role in helping the country move towards higher-order thinking skills (HOTS) by facilitating the development of knowledge based on personal experiences and environmental participation (Higher Education Malaysia, 2018).

Theories, models, and contexts have demonstrated that the library environment plays a critical role in the learning process. The environment is closely linked to the learning experience and can greatly impact user satisfaction. As a result, the learning spaces provided by libraries are a significant factor that can influence the frequency of user visits.

In order to preserve the essential cultural value of libraries, it is necessary to incorporate innovation into library planning. As Hernon et al. (2015) have argued,

libraries must adapt their services by rebranding the library concept with new images and functions to provide more effective services. However, this can pose a significant challenge for librarians. According to Gupta (2003) and May & Swabey (2015), the main challenge for librarians is to offer high-quality services to their users. The key components of library quality services are user recognition, acceptance, and satisfaction with the provided services (Hernon et al., 2015). To improve customer commitment, librarians need to listen to their needs and work towards enhancing the library's image to encourage more users to utilize its services.

Librarians need to ensure that the services they offer meet the needs of their users. To achieve this, librarians should have a deeper understanding of the current users' preferences, needs, and desires in the library's physical environment. Librarians must also revive their service concept and adapt to the changes in the library landscape. Failure to do so could result in the closure of libraries, as evidenced by research findings (Koontz & Jue, 2006) that suggest resistance to change is a significant contributing factor.

The researcher drew connections between the academic library in Malaysia and theoretical models as well as contextual changes. Specifically, they examined the clash between library culture and the desire for social activities, identifying issues and proposing solutions to preserve virtual culture. To meet users' social needs, the researcher suggested that strategic drivers such as appropriate background noise and the transformation of library spaces could support the rebranding of library services. However, there is public doubt regarding the necessity of libraries for a modern, democratic, and secular society. Before the rebranding process, the library management requires additional sources of evidence to support their decision-making. Thorough research is necessary to determine the level of user acceptance of the new environment and services before any action is taken.

1.6 RATIONALE FOR THE STUDY

Research has demonstrated that redesigning and modifying curricula in education systems can significantly impact the sustainable development of library learning environments, particularly in the 21st century (Bakare, 2024). This statement is highly

applicable to the current challenges faced by academic libraries in Malaysia, which need to adapt and support the redesigned education system in Malaysia at the Education 4.0 level.

This research provides a logical framework for understanding the evolution of physical learning environments in libraries in response to the changing needs of learners for studying and learning. It can define the better ways to operate a library for silent and focused study, while also supporting higher-level learning space attributes needed to support the current education system in Malaysia, Education 4.0, which emphasizes active and collaborative learning to meet the needs of users.

Libraries are currently undergoing a cultural shift, as they are being transformed from traditional learning spaces into social hubs. This shift has been met with some resistance, as the public still associates libraries with quiet and silence. However, if libraries do not adapt to the changing needs of users, they risk becoming obsolete.

Libraries that do not transform themselves to meet the changing needs of users may face numerous challenges, such as impending closures. Wisner (2001) have warned that libraries may disappear within the next century if they do not adapt to the changing landscape. Additionally, the decrease in gate count is a significant challenge for libraries, and it is essential to assess and understand user requirements and expectations in order to succeed. (Hernon et al., 2015).

Libraries are unique spaces that can encourage creative thinking and have a positive impact on learning, teaching, and research. In recent years, libraries have also become social spaces where users can hang out, relax, and revise. This shift is reflected in the research of Baker and Statements (2019), who found that libraries can be "a catalyst for creativity and innovation." Kiran (2010) also found that libraries can have a positive impact on learning, teaching, and research.

The study by Fisher et al. (2007) suggests that libraries are transitioning into more social places. However, the study also revealed that the inadequacy of physical learning spaces and transformation-related issues can hinder the provision of exceptional services in libraries. Therefore, it is crucial to focus on meeting the needs

of users by improving the quality and suitability of facilities to their preferences and requirements.

Franks and Asher (2014) found that noise levels continue to be a concern for library users. This is because the traditional paradigm of libraries as quiet spaces is changing, as libraries are increasingly becoming social hubs. McCaffrey and Breen (2016) suggest that implementing a noise policy in libraries can effectively address noise complaints and issues. By managing noise levels, libraries can create a more welcoming and productive environment for all users.

The study of library learning spaces is complex, as it involves factors such as noise, user needs, and personal preferences. May and Swabey (2015) note that there is a lack of research on library learning spaces in Malaysia. This is a significant gap, as it is important to understand how library learning spaces meet the needs of users in the current learning environment. To address this gap, further research is needed to explore the suitability and preferences of academic libraries in Malaysia for adapting to sociability activities and to address the issue of noise legitimacy in the library transformation process.

1.7 SIGNIFICANT OF THE STUDY

Bakare (2024) argues that updating educational curricula can directly influence the development of sustainable library learning environments, particularly in the 21st century. This assertion has prompted the need for Malaysian academic libraries to modernize their services and spaces in response to the introduction of Education 4.0 in 2018. Adapting to the demands of contemporary learners necessitates a challenging but crucial transformation of academic libraries.

This study aims to examine user preferences for physical learning environments within the context of Malaysia's Education 4.0 initiatives. Specifically, it seeks to delve deeper into user preferences for academic library layouts, noise monitoring methods that prioritize human interaction over machine control, and it able examines the effects of noise levels on users' learning, abilities, and behavior in learning spaces in academic libraries in Malaysia. It provides evidence-based

information on the relationship between noise levels and learning and will help library managers to create learning spaces that are conducive to learning. The misalignment between the current state of learning spaces and the needs and preferences of users in academic libraries in Malaysia is a significant issue that needs to be addressed. This misalignment can harm the learning experience of students and other library users and can make it difficult for library management to effectively meet the needs of their users. The data presented in this study provides compelling evidence for librarians to devise plans and take action toward reshaping and transforming the library.

Ahmad (2023) highlighted that the lack of research on libraries in Malaysia hinders librarians in Malaysia from planning for the future, as there is a lack of data on the needs of users and the best practices for library transformation. This data is important for policymakers in Malaysia as it can help them to make informed decisions about the future of libraries in the country. The findings from this study can provide valuable information to assist librarians in their future planning.

At present, librarians are preoccupied with defining what the library signifies to academic staff, universities, and users. This includes addressing social legitimacy issues, new learning space features, and noise levels in library service areas. The library is a complex institution, and it is important to have a clear understanding of its role in order to transform it effectively.

The significance of user-centered services in libraries cannot be overstated. Users are the backbone of these institutions, and it is essential to prioritize their needs and preferences in order to provide proactive services to the public. However, both practitioners and researchers in the field of library services have been neglecting users' expectations and satisfaction. This is a serious oversight, as it directly impacts the frequency of users' visits to the library.

Librarians have a responsibility to redefine and meet the latest demands and preferences of users. This can be done by conducting user surveys, focus groups, and other forms of user research. By understanding what users want and need, librarians can create services that are more relevant and effective. Incorporating user-centered design into library services is essential for ensuring that libraries remain relevant in

the 21st century. By putting users first, libraries can create spaces that are welcoming, inviting, and productive.

The researcher's objective is to examine the topic of sociable activities in libraries, specifically the issue of noise and its place in the hierarchy of learning environment factors. This is to better cater to the current learning trends and needs of library users in Malaysia. The study will delve into the details of noise management to address problems with collaborative activities in the library, as well as the physical setup of the learning environment. Furthermore, the study will identify the factors that library users consider important when it comes to noise-related issues in the library. The research will also explore whether users prefer a traditional, passive learning space or a more modern, active learning space.

Noise management is an important factor in creating a conducive learning environment in libraries. By understanding how noise affects users, librarians can create spaces that are both productive and comfortable. The study will explore the following factors related to noise management in libraries:

- The impact of noise on collaborative activities
- The role of physical setup in noise management
- The factors that users consider important when it comes to noise-related issues
- The preferences of users for traditional or modern learning spaces

The study will also explore how users perceive noise levels in the learning space. Specifically, the study will explore how users accept noise levels lower than 55dB in the learning space. By collecting data from this study, it will be possible to identify the needs and expectations of library users regarding their learning environment. The findings of this study will be significant for librarians and library users in Malaysia. By understanding the factors that affect noise levels in libraries, librarians can create spaces that are more productive and comfortable for users. The study will also provide valuable information to users about their own preferences for noise levels in the learning environment.

Due to the rapid advancements in technology and education systems in Malaysia, the data that has been gathered can provide valuable support for library strategic planning. The outcomes of this study will be of particular interest to academic librarians, as it deals with crucial challenges that they currently face. The results could potentially inspire further research on issues related to transformation, increase awareness of other factors that impact library services, and provide a valuable framework for conducting future studies on academic libraries in Malaysia.

1.8 DEFINATION OF TERM

Library Transformation: Library Transformation refers to a situation where the historically entrenched perception, or image, of the library needs to be altered.
Education 4.0: Malaysia's new education system, introduced in 2018, prioritizes student-centered learning to prepare students for the demands of Industry 4.0. This includes fostering critical thinking, problem-solving, and relevant knowledge.
Traditional Library: Traditional libraries are typically characterized by a quiet, formal, and serious atmosphere, with a preferred noise level below 40 decibels. Discussion activities are typically conducted exclusively in designated discussion rooms or areas.
Preference library set up : User preference settings refer to the user's preferred learning environment (modern or traditional) and noise alert methods (human or machine-based) used to manage noise levels in the library's physical space.

1.9 SUMMARY

The introductory chapter of the study outlined the rationale for the study, which was to examine the current state of academic library spaces and services in Malaysia. The chapter also established a learning spaces and noise model in the study and detailed its specific contribution to users in library institutions in Malaysia. The chapter also suggested the ideal or optimal spaces and noise model for academic libraries in Malaysia.

CHAPTER TWO

LITERATURE REVIEW

2.1 OVERVIEW

The literature review is bifurcated into two primary segments: the theoretical and the empirical. In the theoretical domain, an exploration of distinct theoretical models is undertaken, posited to explicate the salient attributes characterizing learning spaces. These theoretical frameworks serve as conceptual paradigms to elucidate the multifaceted dimensions intrinsic to the design and functionality of contemporary learning environments within library contexts.

Conversely, the empirical facet comprehensively synthesizes the outcomes of research endeavors that have systematically investigated the awareness, acceptance, and expectations of librarians and library users with respect to attributes delineating learning spaces. Empirical studies, constituting a substantial corpus of this review, furnish empirical evidence that enriches our understanding of the pragmatic implications and real-world dynamics associated with the evolving nature of learning environments within library settings.

Recent scholarly investigations, coupled with insights derived from practical experiences in libraries, underscore a compelling imperative for a transformative shift in the design and functionality of learning spaces. The evolving nature of the library's learning environment necessitates a nuanced understanding of the needs and preferences of both librarians and patrons. The present study is situated within this evolving landscape and seeks to ascertain the favored learning environment, elucidating perspectives from both librarians and users.

The researcher endeavors to establish a critical nexus between various characteristics inherent in learning spaces and ambient noise levels quantified in decibels (dB). This analytical connection is formulated within the framework of the hierarchy demarcating attributes of learning spaces and their corollary impact on learning abilities. The objective is to discern how diverse noise levels, contingent upon background environmental conditions, intersect with the hierarchical attributes

of learning spaces, thereby delineating a nuanced understanding of the intricate interplay between environmental factors and learning outcomes. The transformations in higher education learning outcomes in Malaysia are linked to the need to revamp academic library services in the country. The library is a service-oriented entity that falls within the service sector. However, some people believe that libraries are obsolete in the current information age and that their services may be discontinued. Despite these negative comments, library services have not been eliminated from society. Libraries are still valued as places to study and learn (Kim & Yang, 2022).

As a result, there is a growing interest among researchers worldwide in exploring the need for transformation in library services. This has led to a study that examines active learning spaces from a different perspective.

This study addresses the knowledge gap outlined in Figure 2.1 by examining users' preferences, concerns, and sociability needs in academic libraries. The current trend of prioritizing user comfort in academic libraries is closely linked to their sociability requirements, which in turn may contribute to noise issues that impact learning abilities in Malaysian academic libraries

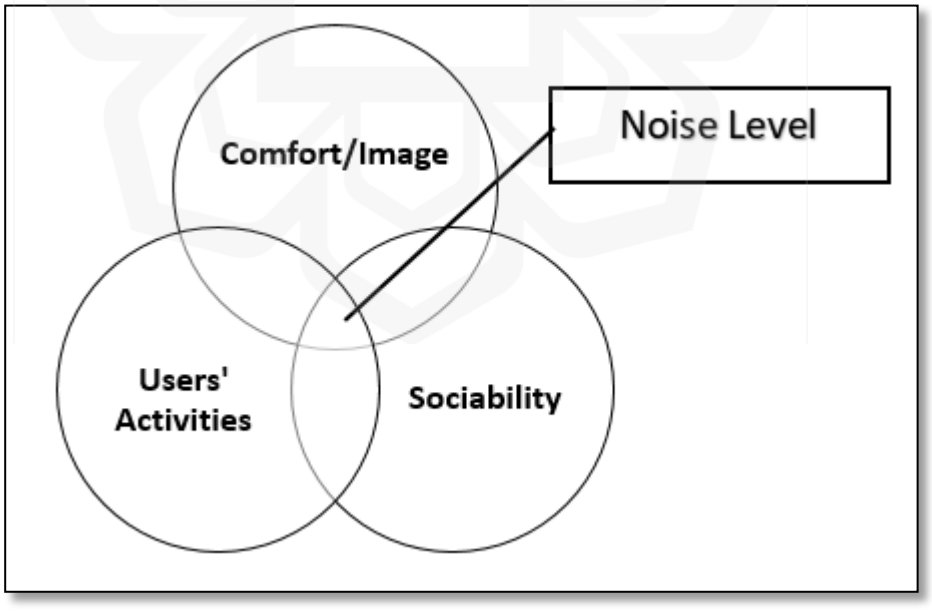


Figure 2.1 Research Knowledge Gap

2.2 PHENOMENON OF ACADEMIC LIBRARY IN MALAYSIA

Libraries are social institutions that play a critical role in society by providing access to information and resources that can support individual learning, development, and social connection (Nurhayati,2018); (Amiruddin, 2022). Academic libraries are also social institutions that are affiliated with higher education institutions and are inextricably linked to students and researchers. They serve as the core of the educational institution by providing a diverse range of scholarly resources to support the academic community's programs of instruction.

Academic libraries operate following the institution's mission to support research requirements and also serve as critical sites for the preservation and dissemination of knowledge. According to the PNM (2020) data, there were a total of 426 academic libraries in Malaysia in 2020. Of these, 20 were public university libraries, 56 were affiliated with private universities, and 350 were affiliated with colleges and other private institutions. Figure 2.2 summarises the academic library information in the year 2020 in Malaysia.

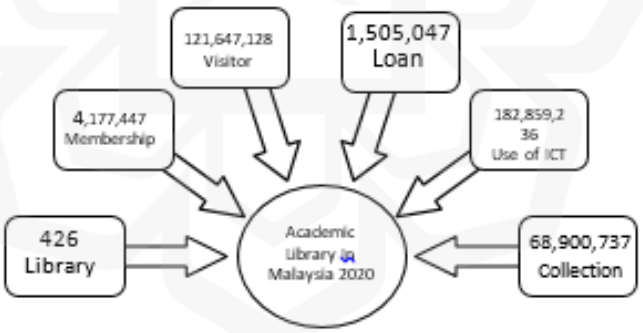


Figure 2.2 Academic Libraries in Malaysia PNM (2020)

According to PNM's (2020) data, academic libraries have the highest proportion of library memberships in Malaysia, with 31.4% of all memberships. This is followed by state public libraries (PAN) with 30.1%, special libraries with 18.7%, the National Library of Malaysia (PNM) with 14.9%, and village libraries with 9.7%. These findings confirm that academic libraries are playing a significant role in shaping current library user trends.

The operation structure of academic libraries in Malaysia is under the administration of the Ministry of Education, which emphasizes Education 4.0. Education 4.0 is a novel educational approach that equips graduates to become knowledge workers by fostering peer-to-peer learning environments and collaborative learning. In light of this educational revolution in Malaysia, libraries have a critical role to play in supporting this education revolution. However, based on research observations, many academic libraries in Malaysia are not fully incorporating cultural innovation into their operations, which is necessary to keep up with the changing education system.

Askey et al. (2013) argue that the library's inability to keep up with cultural changes has resulted in an ongoing conflict between the library's natural evolution and the need to adapt. The researchers observed that academic libraries in Malaysia may struggle to keep up with cultural innovations related to the educational revolution, particularly in the physical learning environment, where users' learning trends and behaviour clash. As a result, librarians may face an ongoing challenge to provide effective physical learning space services that meet the changing needs of their users.

2.3 BACKGROUND OF ACADEMIC LIBRARY

The role of libraries has been the subject of much debate since the 1990s. Librarians, scholars, politicians, and city planners have questioned whether the focus of libraries should be on their physical space or their services. Rasmussen and Skouvig (2008) argue that libraries should evolve to better reflect the needs of their users. Orsde (2010) agrees, stating that libraries need to reconsider their functions and adapt to the changing needs of their patrons in the age of electronic research and reference materials. Haijing, (2022) highlighted that library development should be guided by user demand. The library needs to be reorganized to provide enhanced services that better meet user needs and contribute to the library's overall value.

In Malaysia, all types of libraries are currently upgrading their services to better meet the needs of their users in the 21st century. They are adopting the "People First, Performance Now" principle, which prioritises the wants and needs of their users. Evans et al. (2009) note that libraries are now using business community

services concepts to fulfill the needs of their users. Gyure (2018) also notes that libraries are focusing on providing high-quality services to clients, including creating comfortable leisure reading spaces that offer group stations, quiet study areas, and relaxation spaces for users.

Partap (2017) argues that university libraries are essential for achieving excellence in academic, research, extension, cultural, and social aspects. Libraries are essential community resources that provide access to books, information, and educational programs. Libraries play a vital role in promoting literacy, learning, and intellectual growth. These services contribute to building the intellectual and cultural development of society, as Harun (2006) notes.

Yoshida (2016) argues that the primary role of a library is to provide a collection of reading materials. Brophy (2000) adds that libraries also offer essential services such as learning spaces, reference materials, and information services tailored to the diverse needs of their users. Recent research by Zhan and Widén (2018) has identified two primary roles of modern libraries: service-oriented and system-oriented. Lee and Schottenfeld (2014) and Waxman et al. (2007) define the modern academic library concept as a place that encourages active interactions and collaboration among users. They also describe it as an informal learning space where users, such as students, can perform various activities, including individual focus work, group projects, social gatherings, and relaxation.

Nitecki (2011) identifies three primary functions of libraries: collecting and storing information, providing services to users, and facilitating access to information. However, regardless of these roles, the library's fundamental purpose is to foster knowledge creation and serve as a place for empowerment, learning, and enlightenment (Jochumsen et al., 2013; Johnson, 2016). The library serves as a hub for knowledge, allowing valuable information to be transformed into services, whether in print or electronic format (Zhan & Widén, 2018).

Originally, libraries were designed to support reading materials in printed format. They were equipped with large spaces to store these materials, and the physical printed materials were organized on shelves to make them easier for users to locate them (Grigsby & S, 2015; Spencer & Watstein, 2017; Hockey, 2016).

However, in order to meet the needs of modern users, libraries must now provide a conducive learning environment that fosters creativity and innovation. This includes offering suitable spaces for users to collaborate and develop ideas with their team members (Noh et al., 2018).

2.3.1 Academic Library Issues

According to Mainka et al. (2013), libraries today offer two primary services: digital and physical libraries. Persson (2003) argues that traditional libraries are associated with harmony and industrial society, while modern libraries are linked to the information and media society. In the context of a continually evolving educational environment, libraries face the increasing challenge of modifying their physical spaces to align with the cultural shifts and the dynamic needs and learning preferences of their patrons (Wong, 2023). To prevent libraries from becoming obsolete, they must respond to the changing needs and requests of their users and adapt to the global transformations that are taking place. This is one of the options available to libraries.

Gayton (2008) argues that the availability of electronic journals and books has led to a decline in library usage, with many people no longer visiting libraries. Wisner (2001) predicts that libraries may disappear within the next century due to this decrease in visitors. Elizabeth Jean Milewicz (2009) suggests that changes in the way people search for information and the unappealing physical learning spaces in libraries have also contributed to this decline in library attendance. Gayton (2008) notes that while there has been an increase in the use of electronic resources, there has also been a decrease in the circulation of materials and a decline in the number of people visiting libraries. Ojennus and Watts (2017) observe that a discernible trend in learning is the preference for electronic collections over print collections.

Library management around the world is facing the challenges of globalization. In the United States, the growth of academic libraries has led to a decline in small and medium-sized libraries from 2008 to 2010, accompanied by a decrease in funding (Regazzi, 2013). A similar budgetary decline has occurred in Denmark (Jochumsen et al., 2012). This is a potential threat to academic libraries in Malaysia. To adapt to this changing landscape, libraries must shift their focus from collections to users (Joan,

2011). Although new library spaces are being created, the traditional image of a quiet library remains a barrier. For example, users at the University of Calabar rated their library as very noisy (38.48%) or extremely noisy (14.70%) (Oyedum, 2012), demonstrating that libraries are no longer silent spaces (Gordon-Hickey & Lemley, 2012b). To meet users' needs, university libraries should provide acceptable noise levels and offer intimate, small, and quiet study spaces, as well as larger group study areas that do not cause distractions or noise that can disrupt other users (Bedwell & Banks, 2013).

Logan and Everall (2019) identified a gap in the user experience (UX) within libraries. This gap exists because the motivations of institutions and individuals differ, which can result in a mismatch between what library management perceives as important to users and the reality of user needs. It is important to bridge this gap and ensure that the services provided by the library are aligned with the needs and expectations of its users. In line with this, Vance's (2018) research highlighted that noise complaints were most commonly associated with areas designated for quiet spaces, group study, and computer use. Library users often require assistance from staff in managing noise issues within the library. The research found that 55% of noise complaints occurred between 5 pm and midnight, which coincides with a time when few staff are on duty. This indicates that the presence of staff in the library plays a critical role in reducing noise complaints and related issues. Therefore, it can be assumed that monitoring of noise issues is needed.

2.3.2 Library Spaces and Services

The physical learning space and overall functional environments in libraries are closely related to the academic performance and well-being of students (Kim & Yang, 2022). The idea of library services as a learning space has been a significant focus within library institutions for many years (Bennett, 2009). Users' learning preferences have shifted, and they desire more physical reading experiences. They seek a deeper connection to real words and a new learning environment. Constructing a learning center that integrates diverse elements is a natural progression in transforming libraries to meet future design standards (Xu, J., Dong, 2022). Library strategic

planning has emphasized the concept of space as service. To achieve this, library space must be designed to meet the needs of users by being at eye level and encouraging activities such as walking and talking, rather than simply sitting and waiting. Spencer and Watstein (2017) suggest that library space design can inspire students to learn, and therefore, library institutions should reconsider their role in using learning theory in library space planning. An effective learning space in the library should be communicative and stimulating, with a colorful design that creates a special mood and atmosphere to support creative thinking. This type of design will encourage users to explore the space (Palaces, 2017).

Jochumsen et al. (2017) argue that the development of four-space models in public libraries has demonstrated the need for change in libraries. Library management has wisely used the four-space model as a reference for how libraries can move into the future. The mission of the four-space model is to provide users with meaningful experiences that can transform their perceptions through storytelling and artistic expressions in the form of media and literature, such as music, film, games, and events.

2.4 REVIEW OF ACADEMIC LIBRARY

A library is a university's most important physical asset (Mulrooney & Kelly, 2021). The public perceives libraries as prestigious institutions, which motivates users to utilize their services (Harisanty, 2019). Libraries are considered the heart of the community and a place of learning, and it is widely believed that they are beneficial for individuals (O'Beirne, 2010). Those who use library services can be referred to as patrons, clients, users, or customers. However, the term "user" specifically refers to individuals who use academic library services (Evans, Amodeo, & Carter, 2009). Therefore, the term "user" will be used to represent individuals who utilize academic library services.

Libraries are an essential component of education and educational systems. They have evolved and expanded their roles to connect with social and cultural values, as well as to provide users with access to reading materials, literacy, and learning opportunities. In contemporary times, libraries have become core cultural institutions

in communities, offering a range of services beyond just reading materials (Yoshida, 2016). Despite the information revolution, libraries have continued to play a vital role in formal education environments by providing quality services to students, researchers, and faculty (Mohindra & Kumar, 2015). A recent study by Smith, J. (2023) emphasizes the importance of two crucial aspects in ensuring the successful repurposing of library spaces: enhanced training for library staff in space evaluation and accessible resources for library renovations. The author argues that the absence of these elements can hinder the ability of libraries to adapt and flourish in the ever-changing information landscape, ultimately restricting their potential for accommodating diverse uses. Libraries also serve as important establishments for social values, where users can improve their capabilities and collaborate to generate and share ideas (Noh et al., 2018).

The library plays a vital role in education, as the quality of higher education is strongly linked to the abilities of a nation's workforce. Therefore, the library is essential to the development of a nation. It is the library's responsibility to provide a conducive environment for users to share and create knowledge that benefits the country. Modern libraries are evolving into actual learning centers that can directly engage with the labour market's needs (Oliveira, 2016). Havre (2017) suggests that promoting innovation and creativity can lead to the creation of new knowledge that is directly relevant to the nation's labour market needs. Consequently, libraries are transforming into places that support innovation, involvement, empowerment, and experiential learning (Jochumsen et al., 2012).

As expected, numerous researchers have investigated and identified new possibilities and roles for libraries (Yoshida, 2016). The emergence of the "cybrarian" or internet-librarian has been predicted, replacing traditional libraries (Rasmussen & Skouvig, 2008). Currier and Wilhelm (2017) found that embracing non-traditional roles in library services is related to students' satisfaction, success, and loyalty.

Throughout the 20th century, library paradigms were primarily reader-centred and book-centred, reflecting the historical value of books, which were once scarce and costly. This is evident in library design, which prioritized book space over reader space. However, the advent of information technology has led to a learning-centered paradigm, which focuses on intentional learning and has transformed library space

design. Changes in library paradigms from reader-centered and book-centered to learning-centered have led to changes in user needs in libraries (Bennett, 2009). Recent research by Demas and Olsen (2023) highlights a growing emphasis on user-centeredness in libraries, prioritizing the specific needs and preferences of patrons.

Bell (2014) argues that libraries should have physical spaces that are highly flexible to accommodate the various needs of users. Additionally, library services should be more productive and helpful, as they play a crucial role in shaping students' innovation and competencies. Keinänen and Kairisto-Mertanen (2019) contend that library management must be responsive to users' demands and adapt the library space accordingly, given the significant impact of learning environments on student learning. To achieve this, Franks and Asher (2014) suggest that current library spaces should be less intimidating and more comfortable, as a comfortable atmosphere can help create a more conducive environment for learning and mitigate noise issues.

2.4.1 Defining of Cultural Traditions in Academic Library

The cultural influence of universities has directly impacted the design and function of libraries. Fischer, Rohde, and Wulf (2007) note that university teaching methods emphasize theoretical and practical points, with a focus on theoretical instruction. This has led to a need for formal and quiet learning spaces in libraries. Traditionally, libraries discouraged group work and enforced quiet study (Franks & Asher, 2014).

Libraries are essential components of education, and their services are highly related to educational activities, particularly research and personal learning (Noh et al., 2018). Libraries are known for their silence, and users still tend to keep them as quiet study places. Quietness is a cultural practice in libraries, and patrons are expected to request others to stay quiet. Noise is seen as a patron behaviour problem that creates inconvenience and annoyance to others (J.Johnson, 1996). The library's physical learning environment supports a distraction-free space, and even library staff have been depicted as shushers (Miller, 2013). Silence is considered the library's most valuable resource (Massis, 2012).

Libraries have traditionally been perceived as peaceful and comfortable places that promote effective studying by allowing for concentration (Cain, 2003). Hansson (2010) notes that libraries did not originally have any social functions to fulfill. Maintaining silence has been a long-standing tradition in libraries, and libraries need to continue providing a quiet learning environment for their users (Massis, 2012). However, determining what constitutes noise is subjective and challenging to address, as what one person perceives as noise may not be bothersome to another (Kung, 2018). The acceptable noise level in libraries in the past has been below 40 decibels (dB) (Snyder Scott, 2000). However, library users and staff often lack knowledge of decibel measurements, and thus they rely on their judgment to define what constitutes noise.

2.4.2 Library Culture : A Quiet Place

The library has long been known as a peaceful environment for reading and research. The peaceful ambiance of libraries has been a longstanding tradition, contributing to their overall reputation. The idea of silence has been a fundamental aspect of library culture for many years which has played an important role in shaping its overall image. The cultural perception of the library as a formal and silent study space is well established and has deeply ingrained in people's minds (Elizabeth Jean Milewicz 2009; Saunders, 1993; Vondracek, 2007). The value of silence as a driving force for students to study alone in the library is evident. Library staff also has to maintain this quiet atmosphere (Miller, 2013). Additionally, library users themselves can play a role in preserving this silent culture without offending.

The library's quiet environment is a valuable resource for individual study, reading, and research. This quiet atmosphere has become synonymous with the image of a library, as libraries have enforced this silent atmosphere over time (Brophy, 2000; Saunders, 1993). The quiet surroundings, along with the comfortable setting, help facilitate concentration and make the library an ideal study location (Cain, 2003; Britto, 2013; May & Swabey, 2015). In post-traditional societies, there is a strong emphasis on serious and formal study, which is why a quiet and comfortable study environment is crucial (Waxman et al., 2007; Cain, 2003). Quiet study areas remain

the preferred option for users seeking a peaceful environment in the library (Lange et al., 2016; Oliveira, 2016).

According to Lange et al. (2016), the majority of users at McGill University Library use the library for individual study purposes. Similarly, Oliveira (2016) reported that 80% of users prefer quiet study areas. Gardner & Eng (2005) found that quiet study was the primary reason students visited the library, followed by computer use and group work. May & Swabey (2015) suggest that social space design can support noisier academic work, while still accommodating individual study preferences. However, it is important to note that quietness and noise are subjective concepts, so creating a standard level of quiet for libraries may be the best solution for maintaining a peaceful environment.

2.4.3 Antecedents Academic Library in 21st Century

The challenges faced by libraries in the 21st century have led to increased interest in library transformation research. Transformations in various areas, such as service content, librarian professional services quality, and rational space service planning, have contributed to the imperfections of library systems during the transformation process (Haijing, 2022).

Libraries play a crucial role in social development, education, information acquisition, culture, technology, and democracy. Bundy (2007) argues that libraries should assess their mission, goals, and values to maximize their impact. The metaphor of the library as the heart of the university has been used since 1992 (Nitecki, 1993). According to Nardini (2001), this metaphor has provided a starting point for users to explore the unique value of libraries in education. Libraries have long been considered sacred places where knowledge is held and shared with patrons and should be treated with respect and courtesy.

Academic libraries are responsible for ensuring positive user experiences and expectations. This is achieved through thoughtful and intentional designs that prioritize users' experiences, using human-centered strategies (Bell, 2014). According to Warren & Herter (2020), library users prioritize independence and freedom from

restrictions in their workspace. This aligns with the general human desire to avoid difficulties, which can be social, emotional, learning-related, or environmental. Without transformation, libraries risk becoming irrelevant learning spaces as their traditional quiet atmosphere may not resonate with users seeking collaborative environments. Libraries must always be looking for new ways to connect with and understand the needs of their community members when designing physical environments and services (Bell, 2014). The library has a significant role in providing space for learning, so it must be flexible in order to meet the demands of users. It is believed that the library space is essential for fostering creativity, innovation, and entrepreneurship among students (Bieraugel, 2019). Therefore, library management should carefully plan their learning spaces in order to maximize their usefulness. He added that library users now expect libraries to be warm and inviting places for active learning, with a relaxed and comfortable atmosphere. They also view libraries as social and restorative spaces. Libraries are currently striving to meet the needs and expectations of their communities. The modern library has evolved in response to changes in education, technology, and communication patterns. Unlike older libraries, which emphasise information, learning, and knowledge, modern libraries prioritize creating safe and supportive environments for students to learn and choose their learning spaces.

A study by Melo et al. (2017) found that 95% of respondents considered the library facilities to be safe and the overall environment to be favorable for students to choose as their learning space. In a 2007 study, Waxman and his team found that people visiting libraries are more likely to see them as places to unwind, connect with others, and recharge. In order to accommodate the evolving needs of library users, the library atmosphere should be arranged based on their current needs. Robert S. Martin (2004) stressed the importance of developing facilities that promote collaborative and social learning in the library. Jyoon (2012) observed that libraries have recognized the importance of offering diverse learning environments to support users' different learning styles. Yu, Su, and Liu (2024) suggested that the overall learning environment can improve the connection between users' experiences in learning spaces. They found that factors like smells can influence users' learning, reading, communication, and social activities, leading to more interactions among them.

Jochumsen et al. (2012) suggest that modern libraries are adopting a new approach to learning, which involves creating learning spaces that support innovation and promote progress. They propose a new concept of the public library's role that focuses on supporting experiencing, discovering, participating, and creating through the use of four overlapping spaces. This four-space model, developed by Danish LIS scientists Dorte Skot-Hansen, Henrik Jochumsen, and Casper Hvenegaard Hansen, describes the need for libraries to transform from passive collection-based spaces to active spaces that inspire and facilitate local community engagement and user innovation. However, the model does not specify the levels of noise allowed in these spaces, and staff and users may encounter background noise issues, given that many of the spaces are designed to support social activities.

2.5 THE TRANSFORMATION OF LIBRARY LEARNING SPACES

In the past, libraries were primarily seen as spaces for focused work and discouraged activities that could be considered distractions, such as eating, drinking, and group study (Miller, 2013; Britto, 2013). Library management began to recognize the importance of aligning library services with user needs. This led to a focus on creating a flexible structure, clear guidelines, and more valuable offerings to better meet the evolving needs of users and provide more efficient and innovative services.(Haijing,2022). This is evident in the rise of large communal study areas and coffee corners in libraries, which are popular trends (Ojennus & Watts, 2017).

As a result of libraries becoming less traditional and more social, there has been an increase in noise levels (McCaffrey & Breen, 2016). This has led to some debate about the role of libraries as places of silence and learning, as opposed to places of social interaction. Mulrooney and Kelly (2021) found that the physical space of a university campus can impact student belonging, with students finding spaces that serve both academic and social functions to be the most important. This is in line with the trend of libraries becoming more social spaces, even if this means increasing noise levels.

Before making any changes to libraries, librarians need to understand, research, and identify the needs of their users (Ojennus & Watts, 2017). Gayton (2008) notes

that people seek a relaxed and comfortable learning environment, which creates a casual atmosphere. However, this relaxed atmosphere in the library can lead to noise-related issues (Franks & Asher, 2014).

In the 21st century, academic libraries have transformed from being repositories of information to learner-centered spaces that support collaboration and teamwork in education 4.0. However, a persistent challenge in these evolving library settings is noise, which can harm both users and staff (Suriyaprabha & Arulselvan, 2023).

According to Orsde (2010), libraries should offer adaptable learning spaces that facilitate group work among pairs and teams. The changing landscape of technology has also led to changes in the way libraries operate, as they must now incorporate different models to adapt to the current transformation in scholarly records, dynamic learning, and information creation environments. This change affects library operations, collection building, ownership, and access (Gyure, 2018). As stated by Joan (2011), the current library institution faces two major challenges: the need for libraries to be viewed as indispensable and the importance of revising libraries' mental models to align with current transformation trends.

Beckers (2016) found that the functional features of physical learning environments are more important to students than aesthetics. Individual studying is preferred in the home, while collaborative activities in higher education are more suited for quiet and closed learning spaces. Orsde (2010) suggests that libraries should offer flexible learning environments that support collaboration and group work. Dillenbourg (1999) defines collaborative learning as working in pairs or teams to learn together. Fisher et al. (2007) found that the quality of the social space is a significant factor in attracting visitors to the library. Therefore, it is important to further define new service models and metaphors for libraries to better facilitate collaborative learning and social interactions.

Britto (2013) argues that the availability of digital and mobile resources and the adaptable learning environment in information commons have changed library users' expectations. Larsen (2010) notes that user behaviour has shifted, with many users now visiting libraries in groups for social activities rather than solely for access to

books and journals. As a result, the physical layout and operation of libraries have been affected.

In a 2010 report, Larsen argues that food and beverages are essential for learning and should be permitted in libraries. Allowing food and drinks in libraries is popular with users, especially those who engage in group work activities. May and Swabey's (2015) study found that users prefer libraries that can accommodate both academic and social pursuits. However, this change in library policy goes against the traditional expectation of a quiet study environment in libraries, as discussed in Franks and Franks & Asher's (2014) research.

2.5.1 Collaborative Learning in The Learning Environment

Libraries can and should serve as social spaces that facilitate community building and interaction. The role of physical libraries has changed significantly in recent years, with libraries now seen as more than just places to store books (Jochumsen et al., 2012). Libraries should offer a variety of learning environments to meet the diverse needs of their users for interaction, as students are aware that the physical environment can influence their interactions with others (Cooper & Fry, 2020). Research has shown that a library's social environment can influence user behavior, with users who are in a more social atmosphere being more likely to stay longer and complete more tasks (May and Swabey, 2015; Petchtone and Sumalee, 2014). By doing so, libraries can become more welcoming and inclusive spaces that support the needs of their communities.

Collaborative face-to-face learning is a critical component of effective education. It has been shown to significantly improve learning outcomes compared to other learning methods, such as virtual learning, intergroup learning, and individual learning. A study by Gutiérrez-Braojos et al. (2018) found that collaborative face-to-face learners scored significantly higher on exams than learners who used other methods. The researchers attributed this finding to the fact that collaborative face-to-face learning allows students to interact with each other and with the instructor, which promotes a deeper understanding of the material.

According to Gandral (2015), libraries should prioritize building a strong sense of community and foster collaboration in the learning process. In addition, it has been observed that collaboration can stimulate people's ideas, leading to the emergence of innovative and creative thoughts. Collaborative learning is a process in which students work together in informal social networks to achieve a shared objective. They communicate with each other, share ideas, and work together to solve problems thus students are actively engaged in the learning process (KenAzzam Robinson, 2009). This type of learning can help students develop a deeper understanding of the material they are learning, as they must explain their ideas to others, listen to the ideas of others, receive feedback, and be able to learn from each other's perspectives and work together in groups to achieve a common learning goal.

Collaborative learning is a more effective learning method than individualistic or isolated learning. Individualistic learning, in which students work on tasks independently, can lead to boredom, frustration, and disengagement.

In addition, collaborative learning can help students develop self-confidence and problem-solving skills. Students who participated in collaborative learning activities were more likely to retain information, develop critical thinking skills, and be engaged in the learning process. These findings suggest that collaborative learning can be an effective pedagogical approach to promoting student learning (Emam, Maii, Taha, and ElSayad (2019). This pedagogical approach is able to increase self-confidence, improve problem-solving skills, and enhance student retention (Emam, Maii, Taha, and ElSayad , 2019). This approach is closely related to social quality, which refers to the quality of social interactions and relationships. Fisher, Saxton, Edwards, and Mai (2007) found that social quality is a significant factor in attracting people to libraries.

The collaborative learning style has a significant impact on the overall physical learning space of a library. The sound levels and layout of the space can have a major impact on how users interact in the library Walton (2015). Collaborative learning is a pedagogical approach in which students work together to solve problems, learn new concepts, or create new knowledge. In Education 4.0, collaborative learning is often facilitated in libraries, as these spaces provide students with the opportunity to share ideas and resources in a collaborative environment. However, these new ways of

utilizing libraries have also led to an increase in background noise (Kim, J.-A., 2017; Cha, S., & Kim, T.-W., 2015; Haapakangas, A., Hongisto, V., Varjo, J., & Lahtinen, M., 2018; Virtanen, P., Koskinen, K., & Viljanen, A., 2018).

By providing more collaborative and social learning spaces, libraries can help students develop the skills and knowledge they need to succeed in today's world (McCaffrey and Breen, (2016). Libraries should consider factors such as comfort, convenience, and a quiet environment when designing these spaces, as these are important factors that attract users to library services as identified by Vondracek (2007).

2.5.2 THE IMPORTANCE OF EXPERIENCE LEARNING IN LEARNING PROCESS

Collaborative learning involves the sharing of ideas to solve learning problems through direct interaction and practical experience. The ability to work effectively in teams is a crucial skill that professionals must develop to tackle the challenges of the 21st century. Collaborative learning is a pedagogical approach that emphasizes the importance of teamwork and collaboration in the learning process. Through direct interaction and practical experience, learners share ideas and perspectives, which can lead to a deeper understanding of the material. In the 21st century, the ability to work effectively in teams is increasingly important in the workplace. Idea sharing through collaborative learning is an essential process for solving learning problems, as noted by Fischer et al. (2007). Individuals can acquire valuable life experiences from both situational and structural factors. These factors include the specific subject matter being studied, the time and space in which the learning takes place, and the social interactions that occur between learners. As Ribeiro and Ribeiro (2014) argue, these experiences can help learners develop a deeper understanding of the subject matter, become more effective communicators, and develop a greater appreciation for diversity.

2.5.3 LIBRARY AS PLACE SPACES AND ACTIVE LEARNING

In the past decade, there has been a resurgence of interest in physical libraries, particularly concerning their content, function, and appearance. Libraries have transformed from passive, quiet spaces with shelves of books to active, flexible environments that facilitate contemplation, experiential learning, inspiration, communication, and innovation (Rasmussen & Skouvig, 2008).

The academic library's learning environment should be transformed from passive to active to meet the current demands of the education system, which are closely linked to the requirements of the job market. In Malaysia, it is essential to train the nation's youth in creativity and innovation to prepare them for the actual labor market demands. Education and libraries are closely interrelated. Havre (2017) argues that higher education and the labor market should collaborate to foster innovation and creativity. He asserts that interaction between these two spheres is essential to achieve this goal because it enables people to generate new knowledge from the insights of both academia and industry.

Education 4.0 is closely aligned with the needs of the workforce. Beckers (2016) and Hockey (2016) have both observed that academic libraries are moving away from traditional, formal spaces and towards more informal, inviting environments that resemble cafes, restaurants, and coffee bars. This shift is due in part to the changing needs of students, who increasingly view libraries as places to collaborate, socialize, and engage in cultural activities, in addition to traditional research. The emphasis in the evolution of library spaces is therefore on creating welcoming and inclusive environments that support a variety of learning and social experiences.

Franks and Asher (2014) found that library users are increasingly visiting in groups for both studying and socializing. This has led to an increased demand for group study areas, which has sometimes come into conflict with the need for quiet study spaces. In response to changes in teaching methods that emphasize active collaboration, libraries have had to provide more collaborative and social learning spaces. (McCaffrey and Breen, 2016).

2.6 LIBRARY SERVICE EVALUATION: THE ANXIETY FACTOR

Miles and Miles (2013) observed that science libraries in the 1980s began implementing various service models in response to changing circumstances. These new models, which were enabled by collaboration with IT, led to more sustainable workflows and improved service delivery. As a result, libraries are now seen as innovators in service delivery, increasing their visibility and accessibility in both physical and virtual environments (Hockey, 2016).In light of evolving societal landscapes, a rigorous reassessment of the strategies employed by physical libraries to fulfill the needs of their communities is essential (Lee, 2023). Michalak (2012) found that transforming libraries can lead to positive changes in learning environments that better align with users' needs and funding allocation. However, academic libraries have struggled to implement these changes due to long-standing traditions and cultural practices.

Librarians may experience stress and anxiety due to the library's outdated practices and the challenges of adapting to the evolving educational landscape, particularly in the context of Education 4.0. The strict adherence to traditional silence practices (40dB) can further contribute to this strain, as it may hinder librarians' ability to effectively serve patrons and meet their evolving needs. Librarians may experience increased anxiety when faced with the challenges of adapting to a changing library environment. Inadequate guidance or support can exacerbate this stress. Additionally, resistance to change within libraries, influenced by factors such as personal biases, physical limitations, financial constraints, and diverse patron needs, can contribute to librarians' overall anxiety.

Orsde (2010) argues that libraries need to re-evaluate their roles and the needs of their users. This can be achieved by prioritizing their main concerns in strategic planning. Libraries may choose to continue to focus on building and maintaining their collections, which is a core part of their identity. Alternatively, they may choose to transform themselves by prioritizing student success, as suggested by Currier and Wilhelm (2017). Libraries can improve the quality of their services by adopting a customer-centered approach, which involves tailoring library resources and services to better fit the needs of users. (Brophy, 2000).

The library has positioned itself as an innovative leader by transforming its traditional services. This transformation has involved a shift from physical service desks to virtual reference services, from a reactive approach to a proactive one, and from working independently to working collaboratively in groups. These changes have allowed the library to better meet the needs of its users in the 21st century (Hockey, 2016).

Libraries have also shifted from individual to group work (Hockey, 2016). Bennett (2009) identifies three paradigmatic shifts in library design: from reader-centered to book-centered, and then back to reader-centered (which he also terms learner-centered). Orsde (2010) makes a similar observation, noting that libraries have evolved from being primarily reading centers to storage centers and, more recently, to learning centers. This shift in focus is reflected in the design of libraries, which have become more open and flexible, with spaces that can be adapted to a variety of needs as in Figure 2.3.

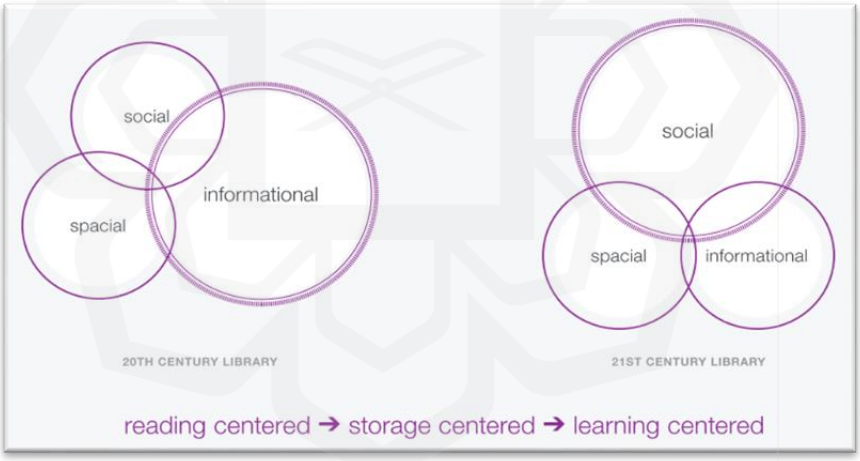


Figure 2.3 The Evolution of the Library (Bennett, 2009)

Bennett (2009) contends that libraries have shifted their focus from providing information to facilitating social interaction. In the past, libraries were reader-centered due to the scarcity of books. However, as the number of printed materials increased, libraries became more book-centered for storage purposes. In the current learning trend and the digital age, where information is readily available, libraries should return to a reader-centered paradigm. Libraries should prioritize the provision of social spaces where individuals can come together to collaborate, learn, and grow together.

2.6.1 ANXIETY MANAGEMENT AND SERVICE QUALITY

Service quality and customer satisfaction are two distinct but complementary concepts that reflect customers' perspectives on quality. Low service quality and customer dissatisfaction can deter users from utilizing library services, which can further contribute to librarians' anxiety as it may affect their job security or professional standing. Service quality is the extent to which a service meets or exceeds customer expectations, while customer satisfaction is the customer's reaction to the service received. These two concepts are related, as customer satisfaction is typically higher when service quality is higher. However, they are not identical, as customer satisfaction can also be influenced by factors other than service quality, such as the customer's mood or expectations (Partap, 2017). Negative feedback or complaints from dissatisfied users can contribute to librarians' stress and anxiety, as it directly affects their emotional well-being. Thus, the current academic library needs to focus on customer support by identifying and implementing strategies to bridge the gaps between customer expectations and service performance.

However, Kassim (2009) argued that the concept of user satisfaction in libraries has evolved to encompass a broader range of perspectives. Hernon and Altman (2015) defined quality service as a way of delivering services. Quality library service is characterized by interaction between the library and the people it serves. A library that does not have users cannot claim to be a quality library, as it lacks a major component of fulfilling people's needs, requests, and desires for information.

LibQUAL is a survey tool used to assess user satisfaction with libraries. The three main areas assessed by LibQUAL are library as place, information control, and effect of services. Library as place is a particularly important area of research in the library industry, as users' expectations for learning spaces are changing. Sullo (2019) found that noise management is not a longitudinal focus of LibQUAL, even though noise is becoming increasingly prevalent in libraries due to the growth of collaborative and group learning spaces. Noise can have a negative impact on the library as a place, so LibQUAL should consider incorporating noise management into its survey.

Kress and Wisner (2012) argue that the key to library success is to effectively and economically deliver services and information that are valuable to users.

McCaffrey and Breen (2016) further suggest that libraries should make themselves into dynamic and vibrant learning spaces that meet the needs of a variety of users.

The user experience (UX) in academic libraries is a complex and constantly evolving field. However, user needs and expectations are the primary drivers of change in this area. As Luke Miller (2015) has noted, "the customer is the only thing that matters in business success." Therefore, academic libraries need to focus on UX in order to meet the needs of their users and provide high-quality services. The sustainability of libraries depends on student satisfaction. Currier and Wilhelm (2017) propose a long-term strategy for academic libraries that prioritizes student success through relationship marketing. This approach involves prioritizing efforts to improve student satisfaction, which can lead to greater loyalty to the library.

The importance of meeting user expectations is evident in the Perpustakaan Negara Malaysia's (PNM) 2014-2018 strategic plan, which calls for in-depth research on user satisfaction with library facilities (Kementerian Pelancongan Dan Kebudayaan, 2014). Bennett et al. (2005) argue that libraries should prioritize enhancing their services and facilities to meet the social quality needs of their users, such as fostering collaboration, creativity, egalitarianism, conversation, social learning, and a sense of community. They suggest that this is a prevailing trend in modern libraries.

As per Godbole's (2017) perspective, quality is not just a concept, but a method to fulfill the requirements and expectations of users, while creating value for them. He argues that the notion of quality is fluid and can be changed to improve products or services. This change should be focused on delivering customer value. Godbole (2017) also emphasizes that quality issues can often lead to the development of solutions. In other words, when a product or service does not meet the needs of users, it can provide an opportunity for innovators to develop new solutions that address those needs. From the user's perspective, a quality product meets their specific needs and expectations, as well as those of a broader customer base. Therefore, a product that is capable of satisfying the needs of a large number of users is generally regarded as a good quality product. During the transformation of a library, it is essential to continuously improve the quality of services in order to ensure that users are satisfied

and their requirements are met. This includes ensuring that the services are user-friendly, reliable, and easy to maintain.

2.7 FACTORS INFLUENCING LIBRARY CHANGE

The prediction that libraries would become obsolete has been around for centuries, but libraries have instead transformed to meet the changing needs of their users. The pace of this transformation has accelerated in recent years, as libraries have embraced new technologies and pedagogical practices. This phenomenon is seen worldwide, including in China. The Ministry of Education has suggested that academic libraries establish a new learning environment. The future learning center should be supported by a combination of diverse learning materials and advanced technology to assist students in learning through innovative information and technology approaches, fostering the transformation of learning methods (Li Pei,2023).

In order to continue to support these evolving practices, libraries need to provide greater space for collaborative learning and group study (Franks and Asher, 2014). A flexible and adaptable structure is crucial for successfully navigating change. This ability is closely linked to the capacity to adapt to new situations, particularly in planning, implementation, and collaboratively supporting diverse user needs (Haijing, 2022). Collaborative learning involves multiple individuals working together to learn a particular subject (Dillenbourg, 1999). Orsde (2010) highlights that modern libraries should facilitate collaboration and group work among users by providing a flexible environment that supports pairs and teams working together.

The physical library is not dead, but rather more alive than ever. The transformation of libraries is not a threat to the traditional role of libraries, but rather an opportunity to reconsider the needs and expectations of library users. (Jochumsen et al., 2012). This transformation is necessary due to the changing landscape of academia, and welcoming policies and facilities are essential to ensuring that libraries continue to serve their users effectively (May &Swabey, 2015).

In a 2017 study, Keyes found that half of all academic libraries do not have clear policies on the accessibility of their facilities or the welcoming of users. This

lack of clarity can lead to users feeling unwelcome, particularly if they are making noise or have children with them. The study's findings suggest that libraries need to make more of an effort to be welcoming and accommodating to all users, regardless of their needs.

2.7.1 Explosive Development in Technology And Media

The rapid development of the Internet in the mid-1990s created uncertainty about the future of libraries (Jochumsen et al., 2012). However, the ICT age has also led to new types of library services, which have brought many changes to Malaysian libraries (Harun, 2006). The use of electronic materials is growing rapidly, and electronic materials are now used as much as or even more than printed materials in libraries. This has led to the emergence of hybrid libraries, which offer a combination of traditional and digital services. A dramatic decline in print lending and an increase in the accessibility of electronic books have been reported. In the UniSA library, print lending decreased by 80% between 2006 and 2015, while e-book usage increased by 785% between 2010 and 2015 (Hockey, 2016).

The role of libraries has been changing in recent years due to the impact of digital technology (Campbell, 2006). Some scholars have argued that the role of the librarian may be replaced by the cybrarian in the digital age. This is because users are increasingly able to find the information they need independently, thanks to the proliferation of online resources. Additionally, library reference services can now be delivered online, meaning that they no longer require a physical library. (Rasmussen & Skouvig, 2008).

Traditional libraries have undergone significant transformation in terms of services, management, and operations. While they still exist, they have evolved to incorporate digital technologies and services. Traditional libraries continue to operate, but they have evolved in new ways in terms of their services, management, and daily operations. These libraries now offer a variety of digital and physical services, which can be divided into two main categories: digital libraries and physical libraries. (Mainka et al., 2013).

The emergence of electronic information has brought about two modes of access, online and offline, which has led to a significant increase in its usage. This increase has made it easier for patrons to access the reference materials they need without having to physically visit a library. As a result, this shift has caused a major transformation in the field of librarianship.

The increasing use of electronic information, both online and offline, has had a dramatic impact on libraries and librarianship. The ability of patrons to access reference materials without stepping foot in a library has led to a decline in traditional library services. The rise of e-books, e-learning, multimedia products, and online information providers has further challenged the role of libraries. As a result, many libraries are facing an existential crisis. The utilization of e-books, e-learning, multimedia products, and online information providers has impacted and posed a threat to the role of libraries, causing concern for the institution. Gayton (2008), Seadle (2008), Vassiliou and Rowley (2008), Kassim (2009), and Hernon and Ellen Altman (2015) have all discussed this issue. Hunter and Ward (2011) suggest that the adoption of digital technology is affecting the changing behavior and needs of library users, as digital technology supports the distribution and use of digital information. Additionally, digital technologies provide support for digital information. The increasing availability of electronic resources has led to a decrease in the use of shelving racks in libraries. This trend is likely to continue in the future, as more and more libraries move their collections to digital formats. As a result, libraries will need to have more physical space available for other purposes.

2.7.2 Malaysia Education 4.0 and Libraries Transformations

The advancement of technology and media has influenced a cultural shift in teaching and learning, leading to changes in behaviors, objectives, and values (Fischer et al., 2007). The use of digital tools has made it possible for students to learn at their own pace and in their own way, which has led to a shift in users' using behaviors and the values of education which more emphasis on collaboration, creativity, and innovation.

The higher education industry is playing a critical role in the transformation of libraries in response to the changing behaviors and values of education. Modern libraries must now facilitate both formal and informal learning, which requires different approaches (O'Beirne, 2010). Formal learning is often structured and instructor-led, while informal learning is more self-directed and learner-centered. Libraries must be able to support both types of learning in order to remain relevant in the 21st century. In the past, libraries were primarily used for formal learning mainly enrolling in accredited courses and preparing for exams (Gayton, 2008). However, contemporary learning in libraries emphasizes creative thinking and collaboration.

Academic libraries in Malaysia play a vital role in supporting the development of educational institutions. As outlined in the Malaysian Education Development Plan, these libraries provide essential resources and services that support the learning and research of students and faculty. In order to fulfill their role effectively, academic libraries must work closely with the Ministry of Education. This collaboration will ensure that libraries have the resources they need to meet the needs of the education community and contribute to the nation's development, as noted by Jyoon (2012).

The evolving learning paradigms in Malaysia are leading to changes in learning spaces, allowing for physical and virtual collaborative learning, according to Higher Education Malaysia (2018). The changing nature of learning in Malaysia is leading to a transformation of learning spaces, with a growing emphasis on physical and virtual collaborative learning. This shift is in line with the findings of a 2018 report by Higher Education Malaysia.

The Malaysian higher education system has undergone a major transformation in recent years in response to the challenges and opportunities presented by the Fourth Industrial Revolution (4IR.) the 4IR has profoundly altered the nature of learning, it is to prepare the nation's workforce for the 4IR, higher learning institutions (HLIs) in Malaysia should focus on aligning with the Education 4.0 learning outcomes.

The transformation, known as Higher Education 4.0, has led to a new culture of innovation, collaboration, and entrepreneurship within the higher education ecosystem. The educational transformation aligns closely with the Malaysian Qualifications Framework (MQF), which outlines eight essential learning outcomes

for a comprehensive education. These outcomes encompass cognitive skills, interpersonal skills, analytical skills, and personal development, as defined by Mustafa (2011). Academic libraries play a vital role in helping students achieve these domains by providing access to a wide range of resources and suitable physical learning spaces and services in which services that promote critical thinking, problem-solving, and collaboration.

The Fourth Industrial Revolution (4IR) has had a profound impact on the academic community in Malaysia. In the past, students were primarily taught to memorize facts and information. However, the 4IR has necessitated a shift in focus towards developing students' critical thinking, problem-solving, and creativity skills. This is because the jobs of the future will require workers who are able to think critically and solve problems creatively. As a result, students in Malaysia are now learning with an eye toward the uncertain demands of their future careers. Education can help individuals enhance their knowledge and develop skills and abilities necessary for success in the 4IR era (Higher Education Malaysia, 2018). Therefore, students must have access to appropriate learning spaces that can help them develop these skills. Appropriate learning spaces should provide students with opportunities to engage in hands-on learning, collaborate with others, and receive feedback from their peers. Libraries are increasingly becoming partners in teaching and learning, providing spaces for collaboration and innovation

The role of academic libraries has undergone a consistent evolution in response to changes in the format and teaching approach in the academic landscape, as noted by May and Swabey (2015). The current education system in Malaysia has undergone a significant shift in focus from teacher-centered to student-centered learning. This shift has been accompanied by a greater emphasis on interdisciplinary teamwork and active learning, as opposed to passive learning and memorization. This change is in line with international trends in education, which have increasingly emphasized the importance of student engagement and problem-solving skills (Architects et al. 2010).

Academic circles in Malaysia are towards higher-order thinking skills (HOTS). HOTS are more complex than lower-order thinking skills (LOTS) and require the ability to analyze, evaluate, and create new knowledge. The ability to generate knowledge based on personal experiences and active participation in one's

environment is essential for developing HOTS (Higher Education Malaysia, 2018). The evolution of thinking skills has led to a shift in learning styles, which has in turn impacted the way users assess information and use libraries. (Gibbs, 2009)

O'Beirne (2010) observed that libraries are widely acknowledged as valuable learning spaces. However, the emergence of Higher Education 4.0 has had a direct impact on library operations, as they are now responsible for supporting the development of higher-order thinking skills (HOTS) in individuals. This has posed a challenge for librarians, who must now provide users with an appropriate learning environment. While libraries must become more social, noise restrictions remain a reality despite the many transformations that libraries have undergone. Thus, before moving to Education 4.0, libraries must thoroughly address the issue of noise in the learning space

2.7.3 Transforming Images with Library Metaphors

Libraries have used metaphors for over many years to describe their functions and images. The changing of metaphors is an essential way for libraries to communicate their transformation to stakeholders. Metaphors can help libraries resonate with users and redefine their purpose. As Guthro (2014) notes, metaphors are an important tool for creating a general understanding of library functions and infusing library success with value. Nitecki (1993) argues that metaphors can also impact users' perceptions of the library's purpose instead, Metaphors are a useful tool for benchmarking library services.

In 2009, Kassim emphasized the importance of using benchmarking to compare good and best practices in academic libraries in Malaysia in order to achieve improvement. By adopting best practices and benchmarking against partners' practices, academic libraries can surpass customer expectations.

Metaphors can be a powerful tool for libraries to communicate their transformation and increase their chances of survival. Joan (2011) noted that metaphors can help libraries to frame their transformation in a way that is both understandable and appealing to their users and the public. Metaphors can help

libraries to transform and survive by facilitating public understanding of the library's new role in society. They can also help librarians and staff reframe their understanding of the importance of inventory, providing direction for the library's future. As Guthro (2014) notes, metaphors can be a powerful tool for change in libraries.

The development of new metaphors for libraries can indirectly indicate changes in the institution's purpose. This was first noted by Nitecki (1993), who argued that metaphors can shape users' understanding of libraries. Dolan (1998) further developed this idea at the ALTUS conference, emphasizing the importance of creating a supportive and welcoming learning environment in libraries. According to Joan (2011), librarians have long used metaphors to conceptualize and communicate the value of libraries

The traditional metaphors of library as place and library as conversation (Lankes, R. D., Silverstein, J., Nicholson, S., & Marshall, 2007) have given way to new metaphors such as library as café, library as commons, and library as makerspace (Guthro, 2014, Kong, R.; Brautigam, 2011). These new metaphors reflect the changing nature of libraries in the digital age. Libraries are no longer simply repositories of books and information; they are also community spaces where people can gather to learn, collaborate, and create. This shift in the library metaphor landscape represents the need for transformation in libraries.

According to Hockey (2016), library planning is increasingly focused on student engagement in physical space. The current conceptualization of libraries as destinations and places to "hang out" has led to an increase in noise levels, as evidenced by a study by Franks and Asher (2014). This is since these types of spaces are often designed with comfortable seating and other amenities that encourage people to stay and socialize, rather than to focus on quiet study, as noted by Franks and Asher (2014). Keinänen and Kairisto-Mertanen (2019) provide evidence that learning environments should be multidisciplinary, which suggests that libraries should offer a variety of spaces that can support different learning styles and needs.

Rasmussen and Skouvig (2008) identified three key trends in the development of new library spaces: the library as a space for experience, the library as a space for

learning, and the library as a third place. These trends are all interrelated, and they all have significant implications for the way that libraries interact with their users.

The three beliefs mentioned in the paragraph have significant implications for library users in terms of their experience, information technology, and sense of home. Libraries can transform themselves into spaces for experience by better understanding the needs of their users and by providing services and resources that meet those needs. These beliefs have significant implications for users, particularly in terms of their experiences, use of information technology, and sense of home.

The authors suggest that libraries should transform into spaces that facilitate user experiences, and to achieve this goal, they propose a new approach to library services called the library as space for learning, which incorporates the use of pervasive information technology. Libraries are increasingly providing spaces that support a variety of learning activities, including creativity, reflection, exploration, and innovation. These spaces can have a positive impact on learning by providing students with a stimulating and supportive environment in which to work (Spencer & Watstein, 2017).

2.7.4 Users Expectation in Learning Space

A study by Beckers et al. (2016) found that students' choices of learning spaces are significantly influenced by their learning activities, personal traits, and preferences as library users. This suggests that libraries should take into account the needs and preferences of their users when designing and managing their learning spaces. In fact, Hong et al. (2021) noted that providing appropriate space for different activities can increase satisfaction with the spaces in an academic setting.

Kassim (2009) argues that the main objectives of librarians and libraries in academic libraries in Malaysia are to satisfy the needs and expectations of users, which in turn supports their ongoing learning activities. However, understanding and responding to users' expectations and needs is a challenging task for library management, as these expectations and needs are constantly evolving. If library

management is unable to identify and provide suitable services to users, it will lead to user dissatisfaction.

The identification of essential areas for learning space services is still an important task, as this will allow for the provision of suitable services to users. Melo et al. (2017) examined how library spaces have evolved to meet user needs. Despite changes, they found that physical learning spaces remain crucial. Their study revealed that 95% of students prefer the current quiet, formal atmosphere of the library. This indicates that libraries can continue to maintain their traditional design while playing a vital role in student learning. By fostering a conducive environment, offering staff support, and providing individual and group study spaces, libraries can remain relevant and valuable to students. However, Foote (2019) suggests that academic library learning spaces should be designed to be modern, flexible, mobile, creative, technology-oriented, and supportive of instruction. This aligns with the evolving expectations of library users, who increasingly seek comfortable, appealing, and collaborative learning environments that cater to their millennial learning styles.

There is a need for more thoughtfully designed academic library spaces. Quiet areas, social areas, and spaces that support contemporary teaching methods are crucial considerations (Oliveira, 2016). Hillman et al. (2017) advocate for learning commons that accommodate various activities, including collaborative learning, socializing, reading, and computer use. However, Bell (2014) emphasizes that a valuable library must meet and exceed user needs and expectations. Understanding user requirements and providing necessary resources and services is key to achieving this goal.

A study by Regazzi (2013) found that between 1998 and 2010, there was a significant decline in the use of reference and circulation materials in academic libraries. However, there was only a slight decrease in the number of people visiting these libraries. This shift in statistics highlights the continued importance of academic libraries as physical spaces in the academic community (May & Swabey, 2015). In order to remain relevant in the Education 4.0, academic libraries must adopt a human-centered approach to the design of their services and environments. This means focusing on the needs and experiences of users and using evidence-based methods to ensure that library services are both usable and valuable. As Godbole (2017) notes, the ability to add value for customers is critical for business success.

Franks and Asher (2014) and Larsen (2010) argue that current students desire opportunities for socialization with peers, such as enjoying coffee or tea in the library. This finding supports the notion that user preferences for library spaces have evolved. Students seek welcoming services, a vibrant, comfort and contemporary learning environment that fosters a sense of community. Gayton (2008) warned that excessive comfort in libraries can lead to a casual atmosphere that may cause noise problems. This is because students may be more likely to socialize and talk in a comfortable environment. However, the Higher Education Malaysia (2018) emphasized the importance of students feeling comfortable while using library services. This is because a conducive and comfortable learning environment can encourage innovation and creativity.

Libraries are committed to serving their users, and therefore, it is essential to provide user-centered services that anticipate the needs of the public (Erdelez et al., 2008). This includes creating a welcoming, supportive, and lively learning atmosphere where users can socialize with peers and engage in meaningful learning experiences.

Traditional measures of library quality, such as the size of the collection, are no longer sufficient in the age of digital resources. Libraries have assumed new roles in supporting learning and research, and new measures of quality are needed to reflect these changes (Hernon, Ellen Altman, 2015). Unfortunately, practitioners and researchers of library services have often overlooked users' satisfaction and expectations, which are essential for evaluating the quality of library services (Mairaj&Naseer, 2013).

User-centered services are essential for the success of libraries. Librarians must therefore redefine users' expectations and preferences in order to provide the best possible services. This includes understanding what changes need to be made to the physical layout of the library in order to meet users' needs, as well as whether users prefer to retain the current practices or adopt a more modern approach. By understanding users' needs and preferences, librarians can improve the library experience and ensure that it remains relevant in the future.

2.8 SERVICE ENHANCEMENTS: ADDRESSING SOUND QUALITY CONCERNS

The library is undergoing significant changes. To effectively address emerging challenges and provide the best possible services to modern library users in the digital age, it is crucial to support librarians in their evolving roles and implement appropriate policies and practices. Policymakers and library directors should develop comprehensive management plans to guide these transformations. (Ashiq, M., Jabeen, 2022)

The role of physical libraries has changed significantly in recent years, with a focus on encouraging informal face-to-face meetings (Jochumsen et al., 2012). This is because the current library spaces have to play a role in connecting people (Simens, 2008) and promoting collaboration (Bryant et al., 2009). The physical space of academic libraries plays an important role in the current academic community, as evidenced by the fact that over 3,000 academic libraries have reported only a slight decrease in gate counts, despite a significant decrease in loan and reference statistics (Regazzi, 2013). This implies that people are accepting the physical changes to libraries. The importance of physical learning space in libraries is essential to users. In order to ensure that the physical space services in libraries meet the expectations of users, noise-related problems need to be addressed. McCaffrey and Breen (2016) point out that most of the current articles on noise in libraries are opinion-based, and there is a lack of research studies with evidence-based findings. The heterogeneous nature of noise-related problems in libraries makes it difficult to draw definitive conclusions about the impact of noise on library users. Additional research is required to more thoroughly examine the effects of noise in libraries, as the Library learning services (LLS) survey does not provide a detailed analysis of noise-related issues.

LLS focuses on providing high-quality services to clients, including the creation of comfortable leisure reading spaces that can support group work, quiet study, and relaxation. This is supported by the findings of Gyure (2018), who found that LLS that offer these types of spaces can increase user interest in using the library and change user behavior.

Despite the positive survey results of Library Learning Services (LLS), there is still a lack of evidence to support the claim that noise-related problems in libraries are a significant factor in user satisfaction. However, LLS do focus on providing high-quality services to clients, including the creation of comfortable leisure reading spaces that can support group work, quiet study, and relaxation. This is supported by the findings of Gyure (2018), who found that LLS that offer these types of spaces can increase user interest in using the library and change user behavior. Additionally, Keinänen and Kairisto-Mertanen (2019) provide evidence that learning environments should be multidisciplinary, which suggests that libraries should offer a variety of spaces that can support different learning styles and needs.

Academic libraries must consider the noise-related issues of multidisciplinary learning environments in order to achieve greater success. One crucial aspect of this is adapting and improving the physical spaces within libraries, which has become increasingly important and recognized in recent years (Burn et al., 2016). Libraries should strategically meet the current study needs of students by considering their experiences and expectations in physical learning spaces. In order to meet the expectations of today's learners, library learning environments must be visually appealing and inviting, with high-quality interior design that is reminiscent of popular restaurants and coffee bars (Beckers, 2016).

Inviting learning spaces is a user expectation, but it can be challenging to transform libraries. According to Grimes (2019), libraries need to embrace change for the better, but people often resist change. It is difficult to make everyone happy during library transformation. However, the changes made to libraries should be for the betterment of the library, which will encourage users to come in more often and use library services. The needed change in libraries is to work toward a welcoming concept by providing comfortable and easy-to-use spaces.

The transformation of libraries into welcoming and easy-to-use learning spaces is inextricably linked to the issue of noise management. This is a complex and challenging undertaking, as it is difficult to satisfy everyone's needs. As McCaffrey and Breen (2016) argue, noise management is a critical factor in library management, as it can have a significant impact on the productivity and satisfaction of library users.

Regalado and Smale (2015) similarly emphasize the importance of noise control in libraries, as quiet environments have been found to promote productivity in studying.

The challenges of noise management in libraries are complex and multifaceted. The nature of library buildings and the limited resources available can lead to feelings of helplessness and temptation to ignore the noise problem among library management and staff (McCaffrey & Breen, 2016).

The design of library buildings can present a challenge for noise management. A recent case study of four U.S. academic libraries found that open mezzanine levels can lead to noise problems. These levels allow sound to travel through the open space, which can disrupt the quiet study environment that many libraries strive to create. While the installation of double-paned glass walls along the perimeter of the mezzanine levels can effectively block the sound from traveling, limited resources, such as budget, may prevent this solution from being implemented (Franks & Asher, 2014).

The transition of academic libraries to user-centered services, with a focus on quality and comfort, can pose challenges. These challenges include defining new physical space services and noise management in the library, which must be addressed before the organization can achieve its overall mission.

2.9 NOISE IN THE LIBRARY

The transformation of libraries into spaces that promote collaboration, group learning, and social interaction has led to an increase in noise levels, a common yet crucial issue that needs to be addressed. (McCaffrey and Breen, 2016; Sullo, 2019) The subjective nature of noise-related issues in libraries has made noise management a challenge for library staff. Noise can be defined as the absence of silence, and it can lead to public disturbances (Brigitte et al., 2014). Gordon-Hickey and Lemley (2012) have found that students tend to choose their preferred study environment based on the level of ambient noise that they find tolerable. Users who are more sensitive to noise may have to settle for suboptimal study conditions. Library management should take into account the ambient noise level when creating study spaces.

A study by Vance (2018) found that noise complaints in library buildings are concentrated in a few areas, including quiet spaces, group study areas, and computing areas. Crowding is also a common problem in academic libraries that can lead to noise and distractions, as noted by Cha and Kim (2020) and DeClercq and Cranz (2014). This is a well-documented problem that has not yet been solved by public or academic libraries. This suggests that library management should take into account the ambient noise level when creating study spaces in these areas.

The noise problem in libraries is a phenomenon that has been the subject of much discussion by library management and users alike. The question of why users make noise in libraries is a complex one that has yet to be fully answered. According to a survey by Oyedum (2012) at the University of Calabar, a significant portion of students found the library to be too noisy. Nearly 40% described it as "very noisy," while over 14% considered it "extremely noisy. Akanmu et al. (2020) also reported that the background noise levels in the library in Minna, Nigeria exceeded 45 decibels (dB), with the highest value reaching 72 dB. These findings suggest that libraries are no longer providing the silent spaces that many users expect (Gordon-Hickey & Lemley, 2012).

In recent years, libraries have faced the challenge of providing silent learning spaces that meet the needs of all users. This challenge is evident in a survey conducted at the College of New Jersey in September 2016, which found that noise complaints in the library were increasing even though a noise policy was being developed. The policy outlines the areas of the library that are designated as silent and specifies the expected noise levels for each floor. However, even in the quiet study areas, occasional noise can still be a problem.

The unsolved and unanswered problem of noise in libraries requires a solution. Aremu, Omoniyi, and Saka (2015) point out that noise assessment and the formulation of a noise policy will provide a better understanding of the specific acoustic needs of libraries. While library users are aware of their responsibility to respect the rights of others by keeping noise to a minimum, the current noise problem persists because noise is a subjective issue in libraries.

2.9.1 Noise and Leaning Spaces

Noise is a subjective problem, as what is considered acceptable noise levels may vary from person to person. However, the decibel (dB) scale can be used as an objective measure of sound pressure levels in libraries. This scale is based on the logarithmic relationship between sound pressure and human perception, and it allows for accurate comparisons of noise levels across different environments. Libraries use the decibel (dB) scale to objectively measure sound pressure levels in learning spaces (Kung, 2018). This allows them to set noise limits that are conducive to learning.

The decibel (dB) scale is an objective measure of sound pressure levels in libraries. The sound pressure levels in libraries typically range below 40 dB, which is classified as "very quiet" according to Snyder Scott (2000).

The objective measure of sound pressure in learning space is the essential in library research. The identified noiser-related dB level have been reported. Stansfeld & Matheson (2003) 40d-45dB is the maximum acceptable level of noise established by federal and local rules in the library. During the study period, the noise range was from 38dB to 73.80dB and most of the reading was above the recommended limit of 45dB in the library indoor environment (Aremu et al., 2015).

The subjective nature of noise in libraries makes it a difficult issue to quantify and address. However, research has shown that decibels (dB) can be a useful tool for measuring and mitigating noise levels in libraries. Patrons' behavior can be a major source of noise in libraries, and excessive noise can be a source of inconvenience for others. By measuring noise levels in libraries, administrators can identify areas where noise is a problem and take steps to mitigate it. Libraries can mitigate noise problems by using noise alerting tools in areas where noise levels are high. The noise problem in libraries is expected to worsen due to the change in the learning trend, which encourages students to socialize. Hunter and Cox (2014) found that students often engage in social activities such as flirting and chatting while working in libraries, which can contribute to noise levels. McCaffrey and Breen (2016) advise libraries to acknowledge and serve customers who create noise rather than ignoring them.

The changing trends in education have highlighted the significant issue of noise in academic library spaces and services. The issue of noise in academic library environments is a complex and divisive one, and it is worth exploring further. (May & Swabey, 2015). Academic libraries are now struggling to control noise levels, so it is important to explore this divisive issue (Yelinek & Bressler, 2013). Libraries must ensure that acceptable noise levels are maintained to manage this problem, and investigating noise management solutions is essential (Franks & Asher, 2014).

Libraries are no longer able to provide a completely silent space (Gordon-Hickey &Lemley, 2012b). Feedback collected by Currier & Wilhelm in 2017 revealed that libraries are no longer quiet, with noise being one of the major complaints and a prevalent problem in academic libraries (Kung, 2018; Lange et al., 2016c). High-quality noise management is essential in libraries, as noise has been shown to have a significant negative impact on students' attention and concentration levels, which can directly affect their academic performance as it impairs their ability to focus and complete tasks. (Amir Hossein Nafez & SoheilaLotfi, 2017).

As Sullo (2019) has noted, the strategic management of noise in libraries is influenced by two key factors: the desired user population and the user groups. While noise is a natural part of the library learning environment, various methods and research have been suggested and implemented to minimize noise issues. However, the noise problem in libraries remains unsolved, and in some cases, it has even been seen to worsen.

The subjective nature of noise makes it a challenging guideline for library users. The subjective tolerance for noise is a complex and individual phenomenon, with factors such as the type of noise, the individual's personality, and the environment all playing a role. As O'Beirne (2010) noted, the tolerance level for noise is a complex issue in library management. Excessive noise can be distracting, especially for those who view the library as a peaceful place to study, as Crumpton (2007) pointed out.

A clear, quantified noise level guideline could help to overcome the subjective nature of noise complaints. Yelinek and Bressler (2013) found that reference staff at library counters often need to address noise complaints, either by responding to

individual complaints or by suggesting policy changes that could create a more conversational learning environment.

Vance (2018) found that libraries often struggle to manage noise complaints. This is because, despite efforts to make libraries more conversational, silence remains a primary concern for library users. Some users continue to prefer physical learning spaces because they are more tolerant of noise. This can be a major distraction for other library users, who often choose libraries for their quiet environment. As Vondracek (2007) noted, noise can be a significant source of disturbance in libraries. Franks & Asher (2014) stated that the issue of noise levels needs to be addressed, and their research showed that minimizing noise in libraries is the best solution.

Noise is a well-documented problem in libraries. The perception of noise and loudness can vary from person to person (Lange et al., 2016; McCaffrey & Breen, 2016). As libraries have begun to encourage group work in response to changing learning needs, noise has become an even greater issue (Crumpton, 2007). The noise problem in libraries is a significant deterrent to users, as even the slightest sound can be distracting and lead to decreased concentration. This is supported by the research of Hodgson and Moreno (2008) who found that excessive noise can lead to annoyance and decreased cognitive performance. Thus, effective noise management is essential to ensure that library space is used effectively (Franks & Asher, 2014).

2.9.2 Noise Measurement and Noise Management Strategic

The literature on noise management in libraries is extensive, but much of it is opinion-based and may not reflect the actual situation. McCaffrey, Ciara, and Breen (2016) argue that determining what is considered noisy or quiet is subjective and can be difficult to measure. Although the management of noise in academic libraries is an emerging field, both in research and practical implementation, there is still a lack of information and limited empirical evidence on the effectiveness of noise interventions in libraries. Library management needs more evidence to make decisions. Recent research on the use of Noisyfier is effective in reducing noise in libraries and can contribute to addressing noise-related issues in libraries. Noisyfier is a noise monitoring device that utilizes robotics and Arduino mechanisms. It is effective in

reducing noise in libraries, which has led to the generation of robust statistical data and analysis that can be used for library management planning (Suriyaprabha & Arulselvan, 2023). The data is most relevant to current library users, particularly during the library's transformation process. As libraries undergo a cultural transformation to improve their learning environments, many interventions have been attempted to address noise issues (Kung, 2018).

The research literature on noise management in libraries has identified a variety of strategies for controlling noise levels and promoting quiet study. Such as Crumpton (2007) found that furniture placement can be an effective way to control noise levels and direct traffic in libraries. This can also help to discourage group socialization, as people are less likely to talk loudly if they are not sitting close together.

McCaffrey and Breen (2016) acknowledge that limited resources and building constraints can pose challenges for library management in dealing with noise issues. Financial constraints have forced libraries to adopt noise management strategies, such as zoning areas by noise level and rearranging furniture. These strategies aim to reduce noise levels and improve the study environment, even with limited staffing resources.

However, despite noise reduction strategies such as furniture relocation and study zone adjustments, noise remains a problem in libraries. Feedback from library users suggests that these strategies are not sufficient to address the noise problem (Lange et al., 2016).

In addition, inadequate staffing levels, particularly during peak hours, have been noted as a contributing factor to noise problems in libraries as well. A study by Vance (2018) found that libraries operating in the evening received more noise complaints than during the daytime, due to a lack of staff available to manage noise levels. The findings of this study demonstrate that the noise management practices of library staff are essential to the creation of a quiet and productive learning environment for library users. Library users rely on staff to monitor and regulate noise levels, and when staff are effective in this role, users can focus on their studies and research without distraction.

Technological advancements in electronic noise-monitoring devices have the potential to revolutionize noise management strategies in libraries. Some researchers believe that these devices could replace the need for staff monitoring and regulated noise levels, as they could automatically detect and measure noise levels. However, there is some evidence to suggest that these devices may not be effective in reducing noise levels on their own. For example, a study by Hronek (1997) reported that reducing light levels in libraries has no significant impact on noise levels. Despite the implementation of noise management measures, noise problems still occur in libraries. Lange et al. (2016) also found that an electronic noise-monitoring device called "noise sign" did not result in a significant reduction in noise generated by library users. Even though an LED sign was lit up to indicate that the acceptable noise threshold had been reached, users were unable to self-monitor their noise levels at that time. However, this findings might not be generalizable to academic libraries in Malaysia.

The legitimacy of noise levels in libraries can be established by using a calibrated sound level meter to measure the noise levels. The allowed noise level should be clearly stated and communicated to library users. LED lights can be triggered at specific decibel levels to notify users who are unable to self-monitor their noise levels.

2.9.3 Noise Legitimacy in The Library

Sullo (2019) found that noise is a common problem in libraries, and there is a lack of research evidence on effective noise management strategies. Many opinion-based articles have been written on the topic, but they are not always applicable to real-world situations. Noise management has had a measurable impact on users' perceptions of quietness in libraries. Different spaces in libraries require different noise levels. Collaborative spaces, for example, require a certain level of noise in order to facilitate discussion and collaboration. Quiet study areas, on the other hand, require a high degree of quiet in order to allow users to focus and concentrate. As a result, it is essential to qualify noise levels in libraries in order to ensure that all users have access to the learning environment they need. The acceptability of noise levels in libraries varies depending on the specific space. Therefore, a noise legitimacy

message may be the most effective way to alert users to the noise level in a particular area.

Legitimacy is the perception that an authority or institution has the right to exercise power. It is a social construct that is shaped by a variety of factors, including the values and beliefs of the people who are subject to the authority. Legitimacy can be classified into two types: micro-legitimacy, which refers to the legitimacy that is perceived by individuals, and macro-legitimacy, which refers to the legitimacy that is perceived by society as a whole (Johnson, C., Dowd, T. J., & Ridgeway, 2006).

Similarly, to adapt to the needs of library users, the legitimacy of noise is a reflection of the changing role of libraries from reading centers to learning centers. This change may eventually be accepted and become part of the library's cultural practices as libraries become more focused on providing spaces for collaborative learning and group work, the creation of noise is becoming increasingly accepted.

Before librarians can enable noise legitimacy in a library, they must first understand the concept of righteousness. As Douglas (1986) emphasized, legitimacy requires a concept that is both allowable and conventional, and that is in line with the understanding of the community. She further defined legitimacy as applying to the concepts of righteousness and naturalness, which means that it must be consistent with both cultural beliefs and natural behavior.

Trans (1992) argued that coercion is impractical. Weber (1978) stated that legitimacy is associated with an individual's actions to gain influence or status in a group or organization. The legitimacy of noise in libraries is practical, as collaborative activities have become part of Education 4.0. In this educational paradigm, groups of learners work together to solve problems, and noise can be a natural byproduct of this type of collaboration.

The educational paradigm of 4.0 has changed the way that libraries are used and how they operate. Aabo, Audunson, and Varheim (2010) pointed out that libraries serve as meeting places and identified six categories of users, including those who use the library as a square, a place to meet diverse people, a place where people can gather to engage in shared activities, meet with friends and colleagues, and participate in virtual meetings. These six categories of users highlight the importance of libraries as

places where people can come together to learn, connect, and participate in civic life. Libraries are vital in ensuring that people from all socioeconomic backgrounds and cultures have equal opportunities to participate actively in society.

Despite changes in user behavior, libraries have been unable to enforce quiet in their facilities. However, the dissemination of new practices has led to a cultural setback, as it has undermined the traditional role of the library. Walker, H. A., Thomas, G. M., & Zelditch, M., (1986) pointed out that people are more likely to accept changes if they are necessary but less likely to accept changes that they perceive as being disadvantageous to them.

The legitimacy of noise in libraries is a subjective issue, as the rules governing noise levels may disadvantage some users. Zelditch (2001) pointed out that an establishment will not undergo any changes unless they are legitimized by those affected. Despite this connection, noise issues in a library remain a social reality, reflecting the shift from a reading center to a learning center. Therefore, it is important to establish noise legitimacy in academic libraries. This provides guidance for users and to those who are affected which will be enabling effective resolution of noise issues.

Libraries have evolved from quiet reading spaces to dynamic learning environments. As a result, noise is a natural part of library use. Establishing clear guidelines for noise levels is crucial to ensure a balanced experience for all library patrons.

2.9.4 Background Noise Acceptance in The Library

Despite numerous studies on acceptable noise levels in libraries, a definitive standard remains elusive. This inconsistency poses a challenge for Malaysian librarians, particularly those planning academic libraries. It's important to note that acceptable noise levels have evolved over time. In the 20th century, levels were generally below 48.9 decibels. However, in the 21st century, the accepted noise level has increased to around 55 decibels.

As reported by Achsan & Krisbiantoro (2021), a solution to library noise concerns is a noise detection and warning system. Developed at Amikom Purwokerto University Library, this tool employs a MAX4466 sound sensor to measure decibel levels. When noise surpasses 55 dB, the system triggers text and voice alerts. This indicates that 21st-century library management has begun to prioritize maintaining noise levels below 55 dB and has implemented technology to enforce this standard.

Acceptable noise levels in the 20th century were generally lower than 50 dB. Research indicates that the acceptable range was between 40 dB and 50 dB. Several studies support the notion that noise levels below 50 dB are preferable. In particular, Aremu et al. (2015) recommend a maximum noise level of 45 decibels in library learning spaces. On the other hand, Gordon-Hickey and Lemley (2012a) conducted a study titled "Background Noise Acceptance And Personality Factors Involved In Library Environment Choices By College Students" which found that the average level of noise acceptance for students who prefer a quiet environment while reading in the library was 37.2 dB, while the average level for those who prefer background noise was 48.9 dB. This means that library users can tolerate noise levels up to 48.9 dB.

In the context of sound pressure levels, a range of 37.2 decibels (dB) is classified as "very quiet," while 48.9 dB is classified as "noisy" and is similar to the level of speech (Snyder & Scott, 2000, p. 9). Therefore, it can be assumed that noise levels below 48.9 dB are still permissible in libraries.

Beckers (2016) found that students consider physical learning environments to be the most important functional attribute in the learning space area. The range of noise levels allowed in libraries will be need for further investigated as this is an area that needs to be confirmed for future planning purposes.

2.10 THEORETICAL FRAMEWORK

The theoretical framework for this study was a modified and combined version of three frameworks: Logan and Everall's (2019) Hierarchy of Library User Needs, Cunningham and Tabur's (2012) Learning Space Attributes, and Gordon-Hickey and

Lemley's (2012) Background Noise Acceptance and Personality Factors Involved in Library Environment Choices.

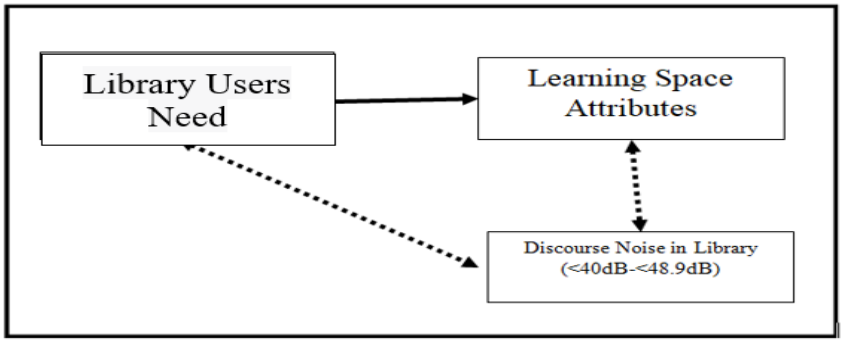


Figure 2.4 The Hierarchy of Library User Needs (Logan and Everall , 2019)
Hierarchy of learning space attributes (Cunningham &Tabur, 2012)

Figure 2.4 illustrates the relationship between the Hierarchy of Library User Needs and the Hierarchy of Learning Space Attributes. The Hierarchy of Library User Needs is a theoretical framework that was developed to help libraries prioritize their services and resources. It is based on Abraham Maslow's hierarchy of needs, which suggests that people have different needs, which must be met in order of importance. The Hierarchy of Learning Space Attributes can be used to complement the Hierarchy of Library User Needs by providing a more detailed understanding of the physical and environmental factors that affect a learner's needs.

The Hierarchy of Needs is a theoretical framework that explains how human needs are met and how they relate to learning. It is closely related to the Hierarchy of Learning Space Attributes, which proposes four design characteristics for learning spaces: access and linkages, uses and activities, sociability, and comfort and image. These characteristics can be used by library managers to design functional, versatile, social, and aesthetically pleasing spaces that meet the needs of learners. The research closely linked the framework to develop learning spaces that meet students' fundamental needs and also support their higher-level requirements for self-actualization and creativity, with acceptable noise levels. The transformation of learning spaces in libraries should take into account the impact of noise-related issues, as physical and environmental factors closely affect a learner's needs. This is

particularly important in the context of Education 4.0, which emphasizes the need for a respectful and productive learning environment.

Gordon-Hickey and Lemley's (2012) study found that individuals who prefer a quiet study environment prefer noise levels of 37.2 dB, while those who prefer to study with background noise prefer 48.9 dB. This has generated interest for the researcher in conducting a study from a different perspective, relating the four design characteristics, sociability, activities of library users, their comfort levels, and acceptable noise levels in the learning space.

By understanding and applying the hierarchy of library user needs, the hierarchy of learning space attributes, and noise-related issues, librarians can create learning spaces that are not only visually appealing but also functional, versatile, and socially engaging, while also addressing the noise-related issues in the learning space to support students' self-actualization and creativity. The researcher intends to explore in more detail the importance of designing desirable learning spaces that cater to the varying needs of users in the era of Education 4.0.

An investigation of the correlation between the Hierarchy of Library User Needs, the Hierarchy of Learning Space Attributes, and the decibel levels of noise in learning environments is essential for the transformation of learning spaces in academic libraries in Malaysia. The Hierarchy of Learning Space Attributes and the Hierarchy of User Needs reflect the latest trend in modern library learning spaces, which prioritizes comfort, sociability, and acceptable noise levels.

2.10.1 Hierarchy of Library User Needs

The Hierarchy of Library User Needs is a theoretical model that categorizes library services and resources based on their importance to users (Logan & Everall, 2019). The hierarchy is based on Maslow's hierarchy of needs, which posits that human needs are arranged in a hierarchy, with the most basic needs at the bottom and the most complex needs at the top. The Hierarchy of Library User Needs follows a similar pattern, with the most basic needs being access to information and resources, and the most complex needs being self-actualization and personal growth.

The Hierarchy of Library User Needs is a framework that considers factors such as the impact of a service on users, the extent to which it is accessed, and its importance in relation to other resources and services offered by the library. This framework is inspired by Abraham Maslow's theory of motivation, which posits that human needs are hierarchical, with physiological needs at the bottom and self-actualization needs at the top. However, the Hierarchy of Library User Needs does not focus on individual human needs; instead, it looks at the motivations of a community for utilizing the library.

The Hierarchy of Library User Needs is a framework that organizes library services into five levels, from the most basic to the most complex. The levels are Library as Minimum Product, Library as Convenience, Library as Connector, Library as Incubator, and Community as Library. The framework can be used to prioritize library services and facilitate discussions between users and libraries. Libraries may want to reassess their resource allocation to ensure that they are providing the services that are most likely to be utilized and valued by their users.

The library hierarchy of needs is a prepotency model, meaning that the satisfaction of one need is dependent on the proper satisfaction of another need. When lower-level needs are not met, higher-level needs become less important to individuals. Al-Aufi and Al-Kalbani (2014) found that lower-order needs in Maslow's hierarchy of needs were more likely to be satisfied than higher-order needs. Librarians must prioritize fulfilling students' lower needs, such as safety and a sense of belonging, by providing specialized services such as by creating a welcoming and supportive environment. Librarians can also help to fulfill students' higher-order needs for esteem and self-actualization by providing opportunities for students to learn and grow.

The lower tiers of the hierarchy represent the basic needs that must be addressed in order to create a positive learning space for students. Figure 2.5 illustrates the hierarchy of library users' needs and the attributes of a conducive learning space (Francis, 2010).

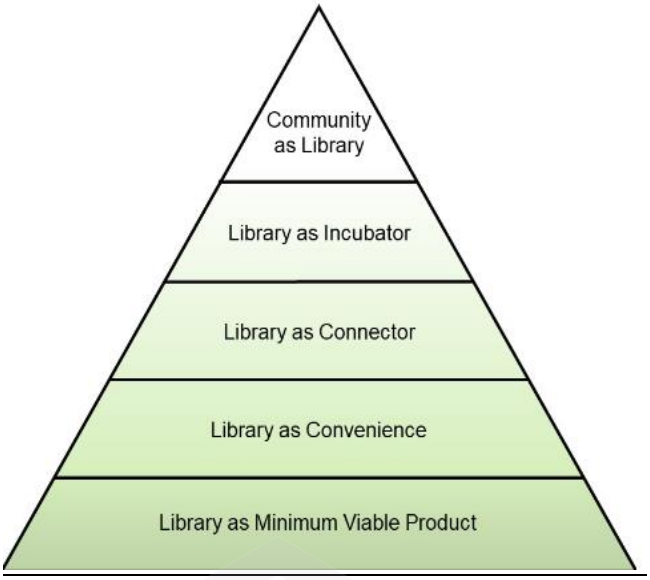


Figure 2.5 Hierarchy of Library User Needs (Logan & Everall, 2019).

2.10.2 Library as Minimum Viable Product

A minimum viable product (MVP) is a basic version of a product that has just enough features to be useful to early users and to validate the product concept. In the context of a library, the MVP would be a functional library that provides users with the essential resources and services they need, such as wireless internet access, access to the library's physical and online collections, and a link resolver. The goal of the MVP is to create a valuable space that can serve as a center for on-campus access and support for learning. Similarly it Academic libraries in Malaysia are essential physical and technological platforms that provide core services to users to support learning and research. The overall operations of academic libraries in Malaysia are sufficient to be useful to early users. They are places where users and libraries interact. The fundamental principle in focusing their products and services is to ensure that they meet the needs of users, which can be categorized into five levels: library as a minimum viable product, library as a convenience, library as a connector, library as an incubator, and library as a community. Due to the changing needs of users, academic libraries must continue to innovate and adapt to change in order to remain relevant and provide valuable resources and services to users in Malaysia.

2.10.3 Library As Convenience

The "Library as Convenience" level of needs is the second lowest in the library hierarchy. It is the most frequently sought-after need by users after the physical space and collections have been established. This is because the majority of users in academic libraries are commuters and centralized, meaning that they travel to the library and tend to use the library's resources in a centralized location (Logan and Everall, 2019).

As a hub for commuting students on campus, the library provides a convenient space for students to study, work, and access library collections. The availability of comfortable and well-equipped study spaces is essential to the satisfaction of these students. Adequate learning spaces that support students in their daily tasks are essential elements that contribute to user satisfaction in this tier. The combination of these conveniences within the library enables students to work seamlessly throughout their learning process.

Academic libraries in Malaysia are able to provide their users with convenient facilities and resources that meet their academic needs due to close monitoring by the Malaysian Qualifications Agency (MQA). The libraries have ample study spaces, and users have easy access to the library's collection of books, journals, and other resources. These factors contribute to the overall convenience of the library's services, which are designed to support the academic success of its users.

2.10.4 Library as Connector

After meeting the users' basic needs of comfort and a supportive learning environment, the next level of priority is to establish positive relationships between the library staff and its users. To ensure the users feel welcomed and a sense of belonging, the library's services and academic resources should be easily accessible and of high quality. The library staff should communicate a welcoming message to users and create an environment where they feel like they are an integral part of the library. When users feel a sense of belonging, it has a direct impact on their happiness while using the library.

There are three objectives in this category. The first is to establish a direct connection between library staff and users. The second is to facilitate user interaction with their peers while fostering stronger bonds between them. The third is to ensure that users feel like they are part of a community of peers. These goals are particularly appropriate for libraries because they serve as a gathering place for members of the community, acting as a "third place." It is crucial to cultivate warm relationships between users and library staff to avoid undermining outreach and liaison efforts. This requires creating an environment of warmth and courtesy between users and staff. The library's resources and services can directly contribute to users' sense of security in the library, as these resources can assist them in achieving academic and personal success and developing their skills. Users can feel secure in the library knowing that the reference resources available can help them maintain good academic standing and support their peers.

Academic libraries in Malaysia play a vital role in providing two core services: learning spaces and educational support services. Learning spaces should be designed to support collaborative learning and group work, while educational support services should focus on providing high-quality reference materials and learning spaces that are able to develop 21st-century skills. These services should be tailored to the specific needs of students and aligned with the learning outcomes of the institution's curriculum. However, the level of tolerance for noise and disruption in learning spaces is subjective and may vary from person to person. Therefore, it is important to develop clear policies that define acceptable noise levels and behaviors in learning spaces. These policies should be reviewed regularly to ensure that they are meeting the needs of students in the rapidly changing educational landscape of Malaysia. It is also important to strike a balance between quiet and group study areas within the library to accommodate different learning styles and preferences.

2.10.5 Library as Incubator

The fourth tier of the hierarchy of learning is focused on meeting the advanced needs of users by providing funding for resources such as maker spaces, audio-visual content creation, and mapping software. This level directly contributes to users'

feelings of self-esteem and can help them achieve success and prestige in their learning.

The fourth level of the hierarchy of library user needs is focused on providing specialized equipment and software that can support users' self-esteem and success in their chosen fields. This level requires significant time and effort from both users and library staff to master, but it can lead to significant benefits for users in Education 4.0 learning spaces. Although such equipment and software may not be readily available to all library users, it can be highly beneficial for those who are engaged in the learning process. Libraries are traditionally quiet places for learning, but the availability of collaborative and noisy spaces can make them even more conducive to learning. As a result, this service is a critical component of the library, as it helps to maintain relevance and connection with users, preventing a disconnect between users and library services.

2.10.6 COMMUNITY AS LIBRARY

The "Community as Library" level is the highest level of the hierarchy, and it refers to the library's role as a community space. This level focuses on the library's ability to bring people together, promote civic engagement, and foster a sense of community. User Needs refers to the library's role as a third place, a space where people can come together to learn, create, and connect outside of home and work. This level goes beyond the traditional role of the library as a place to borrow books and materials. This can be accomplished by providing a physical and virtual space for people to gather and socialize, facilitating collaborative learning and networking among community members, and advocating for the needs of the community.

Academic libraries in Malaysia can promote a sense of community in their learning spaces by providing physical and virtual spaces that are conducive to gathering, socializing, collaborative learning, and networking. They can also advocate for the needs of the community by considering the allocation of social spaces, user activities, and comfort while addressing noise problems and transforming their spaces to be more inclusive and welcoming. The most significant contribution of this tier is through collaborative partnerships and modeling best practices. No additional funding

or resources are required, but policy is essential to ensure that the best practices are adopted, and implemented as well as for setting the best standards.

2.11 CONCEPTUAL FRAMEWORK

It's important to investigate how learners' needs are changing and how the design of learning spaces can be improved to meet those needs, focusing on the different levels of space attributes. Traditional libraries emphasize quiet study, which can be interpreted as meeting the access and linkages to the location, zones, collection, information, and network resources needed for learning, as defined in the hierarchy of learning space attributes model. However, the traditional conceptualization of libraries as places that primarily serve the needs of users for quiet study may not be able to fully meet the higher-order needs of learners as stated in the hierarchy of learning space attributes. The attributes of learning spaces include users and activities, sociability, comfort, and image.

The cultural mismatch between the users and the learning space operation element in academic library Malaysia is happening. The traditional view of libraries as silent places of learning is no longer sustainable for the majority of learning space in current academic libraries. Noise is an unavoidable issue in many academic libraries. The current elements attributed to learning spaces are too broad and do not adequately address the issue of noise in detail. This is because noise is a subjective experience, and the association of libraries with silence is still important to many people.

Cunningham & Tabur's (2012) hierarchy of learning space attributes has offers a valuable starting point for understanding the transformation of leaning space in 21 century and future direction of libraries. However, it lacks the specific details necessary to guide policymakers on noise decibel (dB) levels in library learning spaces, particularly in relation to current user preferences and needs.

To determine the suitability of the framework for application in current Malaysian libraries, specifically regarding noise level issues and user preferences, it is necessary to evaluate its ability to define the relevant elements as outlined in the hierarchy. This will ensure that library management can provide a positive learning

environment that meets the needs of users. The research will also study the library management's views and opinions on learning trends and the Education 4.0 system. The actual areas that need to be improved, the level of preference for the overall operation of physical learning spaces, the acceptable level of behavior, and the suitability for the implementation of learning space attributes will be studied in depth.

A deeper understanding of users' preference toward library societal legitimacy issues in Malaysia, which can help increase awareness among librarians and the public about culture mismatch and overriding goals issues in libraries. The researcher points out that the noise decibel (dB) level in library learning spaces could be an additional contributing factor in the hierarchy of learning space attributes. There is a need for a more in-depth understanding of the societal legitimacy issues facing libraries in Malaysia. This understanding can help to raise awareness among librarians and the public about the challenges of culture mismatch and overriding goals in libraries. Actionable solutions are necessary to improve academic library services and adapt to the changing needs of millennial users.

It is belief that noise levels, user preferences, and current usage behaviors are closely associated highest tier of the hierarchy of library user needs: the community's library. The researcher hypothesized that the three upper tiers of the hierarchy of learning space attributes (comfort, image, sociability, and user activities) are positively correlated with the highest tier of the hierarchy of library user needs (community as library). These attributes are essential for achieving the highest tier of the hierarchy of library user needs and should be considered when designing and developing academic libraries in Malaysia.

The conceptual framework for this study was developed through the combination of one theory and one model, which were supported by one journal finding. The key dimension of the hierarchy of needs theory was applied in this research. The model used to depict the hierarchy of learning space attributes at different noise levels was based on two sets of data collected by researchers.

The hierarchy of learning space attributes is to examine the relationship between noise levels, user preferences, user behavior, and learning ability in library environments, to achieve higher levels of community in library, as outlined in

Maslow's hierarchy of needs theory. The theory posits that humans have a hierarchy of needs and that lower-level needs must be met before higher-level needs can be addressed. In the context of learning, this means that students must have their basic needs for comfort, sociability, and image met before they can focus on learning. Noise can disrupt these needs, making it difficult for students to learn.

The researcher also collected data on the perspectives of librarians and users regarding the importance of transforming library spaces to accommodate sociability activities. The data showed that both librarians and users believe that sociability is an important part of the learning process. However, noise can make it difficult for people to socialize, so the researcher is investigating ways to manage noise in libraries without sacrificing sociability. The ultimate goal of the research is to develop a conceptual framework that can inform the design of physical spaces and services in libraries. The framework will help librarians create conducive learning environments that meet the needs of all users, regardless of their noise preferences. The model is shown in Figure 2.66.

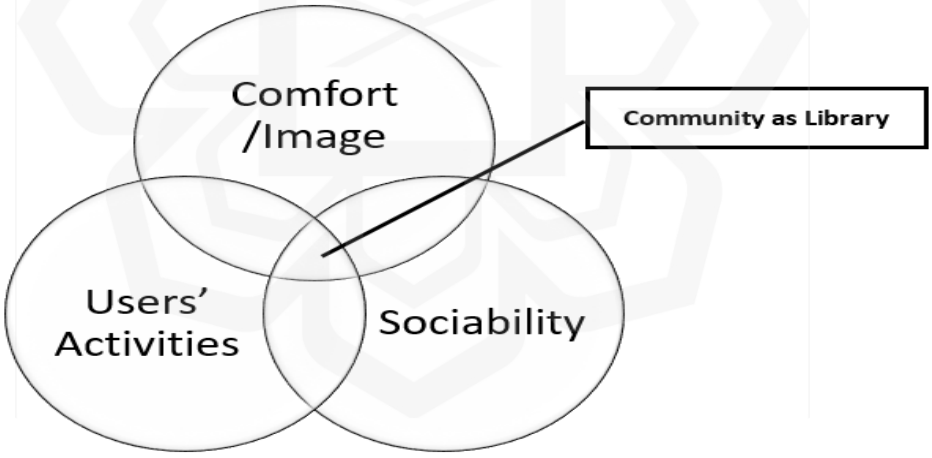


Figure 2.6 Conceptual Framework

2.11.1 Hierarchy of Learning Space Attributes

Cunningham and Tabur (2012) have identified a hierarchy of attributes for learning spaces, which emphasizes the importance of physical characteristics for users. Their model, which is depicted in Figure 2.7, draws a connection between the four

characteristics of desirability in learning spaces identified by Fred Kent and Maslow's hierarchy of needs (Kent, F., & Myrick, P. 2003). Librarians can use Maslow's (1943) hierarchy of needs to consider Kent's four characteristics when designing ideal libraries and learning spaces. The most basic characteristic, access and linkages, meets students' primary pragmatic needs. Once this need is met, students will then look for spaces that also meet their higher-level needs for varied learning and social activities.

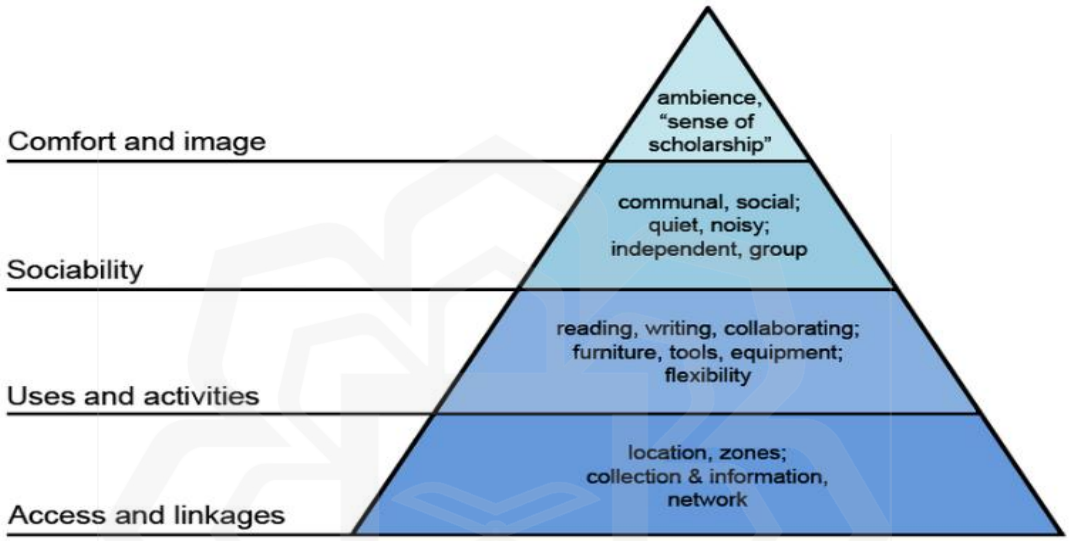


Figure 2.7 Hierarchy of Learning Space (Cunningham and Tabur , 2012)

The hierarchy of learning space attributes is a four-level framework that identifies the key factors that contribute to the quality of a learning space. The four levels are access and linkages, users and activities, sociability, and comfort and image. These attributes are particularly significant for libraries, as they play a crucial role in meeting the needs of library users. The quality of the learning space can directly affect the users' willingness to use library services. For example, a library with a well-designed learning space that is conducive to learning and collaboration is more likely to attract and retain users.

The creation of comfortable and aesthetically pleasing learning environments can promote the use of library services and encourage users to participate in a variety of activities and functions within the space. Tukiman et al. (2015) suggest that such

spaces can also facilitate the development of social skills by providing a sense of comfort and confidence.

2.11.2 Access and Linkage

The hierarchy of learning space attributes identifies the academic library as a central location on campus that plays a crucial role in the university's mission of teaching and learning. Its convenient location allows users to easily access other campus spaces and engage in a variety of activities. The physical proximity of the library is a key motivator for students to use its learning spaces. The physical accessibility and connectivity of the library motivate students to use its learning spaces. The library is divided into sub-spaces or zones designed for different activities, such as quiet study, group work, socializing, and computer access. Learning spaces should be designed to facilitate student movement between different areas as they conduct research, write, study, and socialize. Libraries provide valuable spaces that students can access easily and freely.

Luke Miller (2015) define the value of learning spaces for contemporary students in terms of their ability to provide access to resources such as other students, information technologies, and flexible student and faculty space configurations. Empirical evidence supports this definition, as libraries provide valuable spaces for students to engage in activities such as reading, writing, consulting with peers, using computers, and completing assignments.

2.11.3 Users and Activities

Users and activities are the second lowest level in the Hierarchy of Learning Space Attributes. This is a framework that helps librarians to plan and design learning spaces that meet the needs of their users. The next generation of library space planning emphasizes flexibility and modularity, which allows patrons to reconfigure the space quickly to meet their changing needs. Studies have shown that students spend a significant amount of time in the library and that they are more likely to

engage in academic work than social activities. Students often spend extended periods in libraries to engage in academic work. Given that students often spend extended periods in libraries to engage in academic work, libraries should provide comfortable learning environments and equipment policies that are conducive to student success. The overall design of library spaces should be able to accommodate and suit the current users' learning trends. The learning trend of library spaces can incorporate non-traditional units such as cafés. Flexibility and modularity are also crucial aspects of library space planning to ensure that the library can meet the changing needs and activities of its users.

2.11.4 Sociability

Cunningham and Tabur (2012) argue in their Hierarchy of Learning Space Attributes that choosing to study or work in a library rather than at home is a decision that promotes social interaction and inclusivity. They identify two distinct aspects of the library: communal spaces and social spaces, which require different designs and cater to different user needs. The communal library space is designed for quiet, independent study, while the social library space is meant for collaborative group work and conversation. However, these spaces are not mutually exclusive, and different users have different requirements for quiet, privacy, and social inclusion. The primal human need to see others and be seen is also a motivating factor for people who choose libraries as learning spaces. in additional building relationships with other users and librarians is an essential component of social partnerships and academic success.

Gayton (2008) delineates two distinct categories of library spaces, namely the "communal library," tailored for serene and individualized study, and the "social library," crafted to facilitate collaborative group work and discourse. Both spatial configurations play integral roles in the learning process, with their designs catering to diverse educational requirements. The physical environments within libraries, whether allocated for quiet contemplation or interactive discussions, persist as prominent and sought-after learning spaces within the academic landscape.

Libraries afford students a tranquil and scholarly ambiance conducive to focused learning. Furthermore, the social dimension inherent in library learning spaces

serves as a motivating force, engendering a sense of belonging and visibility among students. This social interaction not only enhances motivation and productivity but also creates opportunities for students to cultivate relationships with peers and librarians. Such interpersonal connections assume significance in the academic sphere, serving as essential components of academic success by offering support, guidance, and mentorship. Logan and Everall (2019) argue that students' behavior and experience of library facilities are influenced by the library's ability to accommodate their diverse needs throughout their academic journey, as well as the library's structure and proximity to other social amenities. Effective and flexible seating arrangements were found to promote approach behavior. The study emphasizes the importance of considering both the physical and social environment in order to improve library facilities and keep them relevant and effective learning spaces.

2.11.5 Comfort and Image

In the hierarchy of learning space attributes, the highest priority in our schema is comfort and image, which is a challenging concept to define. This attribute is essential for motivating students to use library spaces and to continue using them in the future. Despite the intangible nature of this attribute, it has a significant impact on library usage. Users prefer a comfortable and scholarly atmosphere, with natural light and artwork that depicts the university community.

Kent (2003) found that the quality of user workspace and layout were strong predictors of increased library usage. In contrast, simply increasing the number of group study rooms did not have the same effect. Students want their libraries to feel larger than themselves, part of a larger community, and to experience a sense of inspiration. In design exercises, students consistently express a preference for a comfortable and scholarly atmosphere that inspires them. This includes mahogany furniture, old-style lamps, fireplaces, nice carpets, and natural light. They also prefer artwork that was created by or depicts the university community.

Logan and Everall (2019) found that the physical environment of the library has a significant impact on students' experiences. Uncomfortable or distracting workspaces can lead to negative cognitive and emotional responses, which can hinder

learning. The library's ability to meet the diverse needs of students throughout their studies also influences their behavior and perception of the space.

CHAPTER THREE

METHODLOGY

3.1 INTRODUCTION

This chapter outlines the research methodology, research question and hypothesis development. An explanatory sequential mixed methodology was chosen, as it effectively combines quantitative and qualitative approaches. Quantitative methods were used to test hypotheses and analyze numerical data, while qualitative methods explored cause-and-effect relationships. This approach aligns with the inductive reasoning employed in the study. The reason for selecting this method is due to the nature of the research problems, in which the primary objective of the explanatory design is to use qualitative data to explain initial quantitative results. Additionally, this method is capable of testing theories that propose causal relationships, particularly those related to cause-and-effect relationships, by confirming predictions from social theories. (Creswell & Clark, 2018).

The objective of the researcher was to conduct a comprehensive study of user behavior in library spaces in Malaysia, taking into account the ambiguous practices permitted in academic libraries based on the hierarchy of learning space attributes. The study aimed to identify effective methods for adapting to changes in user behavior, such as encouraging social activities and regulating noise levels during regular operations. These efforts are aligned with the emerging library concept of establishing acceptable noise levels in the physical learning spaces of libraries. The research will thoroughly explore the specific areas that require transformation, as perceived by both librarians and library users.

This study aims to conduct a comprehensive and efficient evaluation of the traditional practices employed in libraries in order to assess their applicability in today's academic library environment, taking into account the impact of Malaysia's Educational Transformation 4.0. The study also aims to clarify any uncertainties surrounding this issue and establish whether the existing physical needs of library users still demand a serene atmosphere.

3.2 MIXED METHODOLOGY

This study utilized an explanatory mixed-methodology approach, aligning with its objective of testing hypotheses, establishing causal relationships, and addressing the disparity between user preferences and library operations. By integrating quantitative and qualitative data, the research sought to comprehensively understand the required transformations in library learning spaces. The quantitative data will be collected in the first phase of the study, and the qualitative data will be collected in the second phase. The results of the two phases will then be integrated to provide a comprehensive understanding of the research topic. The explanatory mixed-methodology approach is well-suited for this study because it allows us to gain a deeper understanding of the root causes of changes in learning environments.

The quantitative data will provide us with a broad overview of the changes that have occurred, while the qualitative data will allow us to explore the reasons for these changes in more detail as well as the overall problem and expert opinion on how to implement the changes. The results of this study will be valuable for future research on changes in learning environments. They will also be helpful for practitioners who are working to create more effective learning spaces.

3.2.1 Rational for Using Mixed Methodologies

Creswell (2014) proposes an explanatory sequential mixed methodology research design in which quantitative data is collected and analyzed first, followed by qualitative data collection and analysis to elaborate on and explain the quantitative findings.

In the qualitative phase, a deliberate sampling process will be used to select participants for interviews. The interviews will be conducted after the quantitative data has been analyzed, and they will be used to explain the survey results. The use of an explanatory design will allow us to determine the significance of the qualitative results and how they should be interpreted. By combining the results of the quantitative and qualitative analyses, we will be able to gain new insights and obtain a comprehensive understanding of the phenomenon under study. This joint display

approach will allow us to explain the initial quantitative results within the context of the qualitative findings (Creswell, J. W., & Clark, 2018).

The research objectives and questions provide the foundation for choosing the appropriate research methodology and techniques. In this study, the primary objective is to gain knowledge into users' attitudes and behaviors toward academic library learning spaces and services, in relation to their expectations based on the library's attributes hierarchy.

The Malaysian library industry must thoroughly examine the requirements for appropriate physical learning environments that are plagued by noise problems. Specifically, they must address the "why" behind users' preferences in learning environments and the acceptable level of noise. Additionally, they must determine the steps necessary for library management to implement any necessary changes to improve the learning space.

According to Creswell, J. W., & Clark, 2018 explanatory sequential design is a straightforward mixed methodology research design that is suitable for researchers with limited resources and quantitative-oriented research problems. In this design, the researcher first collects and analyzes quantitative data, and then uses the results of the quantitative analysis to inform the collection and analysis of qualitative data. This allows the researcher to gain a deeper understanding of the quantitative findings and to explain the results in more detail.

The explanatory sequential design is often used by researchers who adopt a post-positivist philosophical position. However, the design can also be used by researchers who adopt a constructivist philosophical position, as long as they are willing to use multiple philosophical positions throughout the research process.

The determination of the appropriate research methodology and techniques for this study is contingent upon the identification of research objectives and questions. The primary objective of this research is to gain an understanding of the perspectives of users and librarians on academic library learning spaces, with a specific focus on users' needs as they relate to the hierarchy of library learning space attributes model. The lack of clear guidelines and uncertainty around operational policies make it necessary to understand how learning space practices can be transferred to libraries in

Malaysia. This includes determining whether the current emphasis on serious, formal, and quiet library practices is still applicable. The Malaysian library industry should conduct in-depth research on the issue of suitable physical learning spaces with noise concerns. This research should include determining which types of learning space environments and noise levels are acceptable to users. By employing this research approach, the strengths of both quantitative and qualitative methodologies are leveraged. The collected data is analyzed separately and then integrated in accordance with the research questions.

3.2.2 Research Question and Hypothesis

This research addresses three research questions and twelve hypotheses. The research hypotheses are outlined in sections 2.9.4 and 2.6.4. This study examines research findings on acceptable noise levels and preferred noise control methods in libraries, addressing a gap in understanding current noise management practices and potential improvements for Malaysian academic libraries. It also hypothesizes that user expectations for learning spaces can be identified by examining discrepancies in research findings related to user preferences and library management concepts. This study aims to bridge the gap between future physical learning space planning and current user expectations and preferences, supporting the implementation of Education 4.0 in Malaysia. The following research hypotheses are proposed to guide the study. The following research hypotheses are formulated in response to the research question of the study.

- H1: The discourse noise levels of <45 dB (independent variable, IV) affect users' reading comprehension scores (dependent variable, DV).
- H2: The discourse noise levels of <50 dB (IV) affect users' reading comprehension scores (DV).
- H3: The discourse noise levels of <55 dB (IV) affect users' reading comprehension scores (DV).
- H4: The users' learning ability scores (DV) in reading are different before and after the 3 different levels of discourse noise as <45 dB, <50 dB, and <55 dB (IV) in defining the most suitable noise level and learning ability.

- H5: Users' preference in academic library setup (IV) influences users' reading comprehension scores (DV).
- H6: The influence of users' reading comprehension scores in different levels of discourse noise (DV) depends on the users' preferred library setup (IV) by the user.
- H7: Users' preference for library noise control methods (IV) influences users' reading comprehension scores (DV).
- H8: The influence of users' reading comprehension scores in different levels of discourse noise (DV) depends on the preferred library noise control method by the user (DV).
- H9: Users' preference for the need of transformation (IV) influences users' reading comprehension scores (DV).
- H10: The influence of users' reading comprehension scores in different levels of discourse noise (DV) depends on the preferred library users' need of transformation by the user (DV).
- H11: The influence of users' reading comprehension scores in users' preference of library setup (IV) depends on the users' preference need of transformation (DV).
- H12: The influence of users' reading comprehension scores in users' preference of library setup (IV) depends on the users' preference on noise alerting methods.
- H13: The influence of users' reading comprehension scores at users' preference in library transformation need (IV) depends on the users' preference on noise alerting methods (DV).

3.3 QUANTITATIVE RESEARCH

3.3.1 Experimental and Questionnaire Research Design

Experimental research allows for the comparison of different groups of participants under different conditions, providing insights into the effects of those conditions on the participants' behavior. This study aims to conduct a social science survey to explore the levels of noise in academic libraries and to examine the factors that

influence the behavior, characteristics, and actions of library users. Given the complex nature of the research questions, the researcher employed an explanatory mixed methodology research design to gather data on the actual situation in the library regarding noise levels and user behavior.

The research employed a mixed-methodology approach, utilizing a combination of true experimental, post-test, and comparative research designs to collect data. The researcher primarily used a true experimental design, a quantitative research methodology, to gather data (Lowhorn, 2007). Lowhorn (2007) emphasizes that field-based experiments provide a more accurate assessment of real-world behavior compared to concept studies, which often rely on participants' self-reported responses. The quantitative method involves the collection of numerical data to determine the extent of a particular circumstance, as noted by Evans, Amodeo, and Carter (2009).

The researcher has elected to use an experimental approach to compare independent samples of participants under different conditions. This design will allow for testing and comparison, which is essential to the study's goals.

The purpose of this study was to explore the effects of different noise levels on the acceptability of noise during the learning process. A true experimental design was employed, with the independent variable being the noise level (<40 dB, <45 dB, <50 dB, and <55 dB). The dependent variable was the acceptability of noise, which was measured before and after the experimental process. The experimental group was exposed to different background noise levels, ranging from 40 decibels (dB) to 55 dB. The experimental variable was the noise level, which was observed to determine its effect on participants' test scores. In the experimental process, the researcher used Bloom's Taxonomy to assess participants' reading ability and designed questions based on cognitive skills to test their learning ability in reading.

The researcher will use Bloom's Taxonomy to formulate comprehension questions that are aligned with the cognitive skills of primary school students. Level 1 questions will assess students' ability to recall factual information, while Level 2 questions will assess students' ability to understand and interpret information. This

approach will ensure that the questions are accessible to all participants and that they accurately measure their comprehension of the material.

The comprehension reading test papers were presented in Bahasa Malaysia, the official language of Malaysia. Bahasa Malaysia is taught as a mandatory subject in primary and secondary schools, and the researcher noted that most users had the necessary proficiency in the language. The researcher gathered online articles and modified them to create the reading materials and the researcher designed the accompanying questions. The researcher then submitted the comprehension questions for validation to confirm their appropriateness for assessing the reading comprehension skills of undergraduate students.

As part of the experimental process, participants were given two brief articles comprising a total of 20 objective questions (10 in each article) in both pre-test and post-test. Participants were provided with photocopies of the articles to read. These were distributed individually during the experiment. At each stage, participants were asked to answer corresponding questions.

To gather participant preferences, we showed them pictures of both traditional and contemporary library designs. The participants were asked about their preferences for collaborative learning spaces and their opinions on the installation of automatic noise monitoring systems in learning spaces. They also provided demographic information about themselves.

3.3.2 Experimental Research Procedures

The independent variable in the experimental process was the background noise level, which was manipulated at three levels: <40 dB before the test and <45 dB, <50 dB, and <55 dB after the test. The experimental group was exposed to a range of noise levels from 40 to 55 decibels (dB). The independent variable was the noise level, and the dependent variable was the mark score.

The dependent variable was measured through test scores, including individual scores before and after the treatment, as well as the total test score. To analyze the

data, we used the scores from the pre- and post-test assessments. These assessments were administered as follows:

Individual users who met the established criteria were invited to the discussion room to complete the pre-experimental tasks.

1. Participants will be randomly assigned to one of three groups (Group 1, Group 2, or Group 3) by drawing a slip of paper from a sealed box.
2. To ensure that research participants fully understand the study, all participants must sign and return the consent form to the researcher before the survey begins.
3. Participants were given an overview of the experimental procedure. A brief briefing about the overall experimental process was given before the experimental survey was conducted.
4. The participants completed various sections of the survey. In Section A, participants provided demographic information such as gender and number of library visits. In section B, the participants were presented with four printed photos depicting different learning spaces. They were asked to indicate their preferred learning space, formal or informal. In section C, the participants were asked about their opinions and preferences for an automatic noise monitoring system in common areas. They were asked to rate their level of agreement with a series of statements about the system.
5. Participants will be asked to remain seated after completing Sections A, B, and C. The researcher gathered all completed documents.
6. The experiment will begin in Section D for the control group. Participants will receive the Section D article and be asked to read it in a background noise of 40dB.
7. The researcher collected Section D articles after participants confirmed that they had completed reading the documents.
8. The participants were administered an objective test (Section E) and their responses were collected upon completion.
9. After completing Sections A, B, C, D, and E, participants were asked to remain seated

10. The experiment will begin with the treatment group participating in a post-test design. Background noise levels will be displayed based on the group number, determined by drawing a slip of paper from a sealed box.
11. The treatment group will then complete a series of tasks. The tasks were as follows:
    a. The researcher presented participants with background noise at three predetermined levels: less than 45 decibels, less than 50 decibels, or less than 55 decibels.
    b. Participants were given a copy of a comprehensive article (section F) to read. The article was collected after participants had finished reading it.
    c. The participants were presented with a standardized test consisting of multiple-choice questions to complete (section G).
    d. Upon completion of the questionnaire by the participants, the researcher collected the question paper.

3.3.3 Population and Sampling Process

This study will utilize the findings of a quantitative study to examine the library usage patterns of students at Higher Learning Institutions (HLIs) in Malaysia. The research will be limited to students who have previously used the library, and the population for the study will consist of 384 students from HLI. Using Krejcie and Morgan's (1970) sample size table, the researcher determined a sample size of 384 participants. This calculation was based on the original population of 4,177,447 members in Malaysian higher learning institutions, as recorded in the PNM (2020) academic library data.

The sample will be stratified into three equal groups of 128 participants each. These groups will serve as a control group for the initial experiment. Subsequently, all participants will engage in a treatment experiment, adhering to a true experimental research design. All three groups initially served as control groups, exposed to a noise level of 40 dB. Subsequently, each group participated in a treatment experiment, with

Group 1 exposed to a noise level below 45 dB, Group 2 to a noise level below 50 dB, and Group 3 to a noise level below 55 dB.

The sampling process was as below:

- Step 1: To seek approval from the management of (HLIs), a Higher Learning Institution in Johor, to conduct a survey among its students.
- Step 2: A simple random sampling (SRS) method will be used to select the sample, ensuring equal probability of selection for all members of the population, as recommended by Sekaran and Bougie (2013). A sample size of 384 will be selected based on the Krejcie and Morgan (1970) sample size table to determine the appropriate sample size for the study.
- Step 3 : To obtain the names and identification numbers of students from the Higher Learning Institution for the year 2021, the student name list will be transferred to Excel and sorted by student ID number in ascending order.
- Step 4: . The first 384 students from the sorted list were selected as the sample. To verify eligibility and obtain consent, each student was contacted by phone to inquire about prior library usage and willingness to participate in the research. In instances where students were unable to participate, replacements were sequentially chosen from the remaining students on the sorted list, commencing with student number 385.
- Step 5: Before scheduling the experiment survey, the selection criteria for participants has be confirmed. The criteria will include academic library users who have volunteered to participate, are currently with active student's status, have used library services previously, have normal hearing, and have no history of otology or neurological disorders. Only those who meet these criteria has confirmed for the experiment survey appointment.

3.3.4 Instrument Materials in Experimental Research

The use of a decibel level gauge is essential to objectively measure noise levels, as the terms "noisiness" and "quiet" are subjective. The experiment will be conducted in the discussion room area of an academic library. A smartphone will be connected to the internet via Wi-Fi to access the YouTube video forum titled "Managing Stress: Protecting Your Health" published by Harvard University. The video will be played through a Bluetooth mini speaker amplifier, which will allow the audio to be heard clearly in a small to medium-sized room. The total length of the video is 54.33 minutes.

During the experiential process in the library, the forum will serve as a source of background noise for social discussion. To ensure the accuracy of the measurements, the average decibel (dB) reading will be used as a standard. The sound level will be measured at 30-second intervals to obtain an average reading. The experiment will begin and end with each noise value without adjusting for the confirmed average sound levels. The mini amplifier speaker will be positioned directly in front of the participants at a 180 azimuth, and they will be seated at a table five feet away from the laptop mini amplifier speaker

A sound level meter (SLM) will be used to measure noise levels. As J. Acoust. Soc. Am., Maisonneuve et al. (2010) have noted in the Journal of the Acoustical Society of America, modern smartphones can be used to replace both dosimeters and SLMs. Smartphone-based sound measurement apps are readily available and be reliable for estimating occupational noise exposure. In 2014, Kardous& Shaw found that sound measurement apps for Apple smartphones and tablets were accurate within ±2 dB of reference sound level measurements. This suggests that smartphone-based sound measurement apps can be a valuable tool for occupational health professionals who need to assess noise exposure levels.

The study will employ an iPad and a sound meter application to measure sound intensity in decibels (dB), as shown in Figure 3.1. The mean dB value displayed by the sound meter will be used as a reference for determining the background noise level.

Figure 3.1 Sound Meter Apps

3.3.5 Participants Response in True Experiment Process

The overall data collection process was delayed due to the COVID-19 pandemic. The study was initiated immediately after the announcement of the reopening of higher education institutions in the country, and data collection was completed over 10 months from April 2021 to February 2022.

3.3.6 Data Analysis Technique

The survey data was imported into SPSS version 20.0 for analysis. A preliminary assessment was conducted to examine the descriptive statistics. The normality of the data distribution was evaluated through the utilization of 'skewness' and kurtosis level to verify that it adheres to the necessary criteria. The normality of the data distribution was assessed using skewness and kurtosis to ensure it met the required criteria. Pearson correlation analysis was then conducted to evaluate the reliability of the data.

Next, the hypotheses regarding the relationships and differences between the variables were evaluated using the t-test, one-way ANOVA and two-way repeated measures ANOVA. Finally, descriptive statistical measures were used in the analysis.

3.3.7 Pilot Test

A pilot study was conducted with ten library users to assess the effectiveness of the experimental process. The results indicated that the articles and questions designed for sessions A-G were clear and easily answered by participants. Furthermore, the overall structure of the experiment and the equipment used were well-received.

3.3.8 Limitation of Scope

This study focused solely on the experiences of undergraduate students using library facilities at the Higher Learning Institution. The data collection process took longer than anticipated.

3.4 QUALITATIVE INTERVIEW

In the second phase of the explanatory mixed-methods approach, qualitative data collection will continue. The quantitative data gathered in the first phase will inform the design of qualitative interviews. These interviews will elicit librarians' perspectives on the quantitative findings, providing additional insights into the research topic. Babbie and Creswell (2014) argue that qualitative methodologies are the most commonly used approaches for researching complex or undefined social issues. These approaches allow researchers to gain a deeper understanding of people's experiences, emotions, and motivations by analyzing their words, actions, and interactions. Hennink and Hutter (2011) and Harding (2019) also highlight the importance of interview methods in qualitative research, as they can provide researchers with a rich and detailed understanding of participants' perspectives.

Interviews are a qualitative data collection method that involves two-way communication between the researcher and the participant. This allows the researcher to gather detailed information about the participant's thoughts, feelings, and experiences. Chua (2013) suggests that interviews are particularly effective for understanding user needs and desires, as they allow participants to explore their thoughts and ideas in depth. Miller (2015) similarly highlights the significance of interviews, asserting that they can be utilized in conjunction with other techniques, such as surveys and usability testing, to achieve a comprehensive understanding of user experiences. Daymon (2011) notes, interviews are not simply a matter of asking pre-determined questions; they are a process of engaging in open-ended conversations that allow participants to share their insights and experiences. This allows the interviewer to develop a deeper understanding of the participant's perspective and to build rapport with them.

Because of this, the researcher deemed the method of intensive interviews to be a suitable and valuable way for interviewees to express their opinions openly and freely about the quantitative findings of the analysis of academic library users' preferences and opinions regarding the library's physical learning spaces. The researcher believes that the comfort of library users is closely linked to their emotional state, and therefore, the research objectives require a thorough examination of librarians' perceptions, problems, and emotions about the data findings on patrons' preferences for library learning spaces, which were obtained from quantitative methodologies. This interview approach allows the researcher to gain insights from experts and professionals about their perspectives, barriers, and problems that they may face and need to overcome.

In 2018, Vance's study found that noise complaints in libraries were primarily concentrated in a few specific areas, including quiet spaces, group study areas, and computing areas. This study aims to further explore librarians' perceptions of the following issues: transforming library space attributes, applying noise legitimacy policies, and users' preferences for the installation of noise detection machines in libraries. The levels of noise tolerance in the common learning space of the library should be considered when determining whether it could potentially be used as a

common area. Some students may be more tolerant of noise than others, and it is important to create an environment that is conducive to learning for all.

The researcher pre-tested the interview questions with two librarians who were representative of the study sample. This was done to ensure that the questions were clear and understandable and that the interview method was feasible. The pre-test was conducted using Zoom, which is a video conferencing platform.

3.4.1 Mixed Model Interview Strategy: Zoom Interview

Semi-structured interviews were conducted via Zoom with participants who had given informed consent. The questions were based on a predetermined set of questions, and follow-up questions were asked to explore respondents' answers in more depth. The questions were also allowed to be modified or expanded based on the responses of the participants. The resulting interview transcripts were entered into the qualitative data analysis software Atlas.ti for further analysis and coding.

The information obtained from participants' interviews was used to identify and define areas of change, librarians' perceptions, challenges, and the librarians' emotions about patrons' preferences for library learning spaces, and accepted practices within academic libraries. This data also provided valuable insights into how librarians perceive the library and how their acoustic environment affects the concept of change.

As stated by Gray et al. (2020), Zoom Video Communications Inc. (Zoom) is a novel and exceptional video conferencing tool that has been shown to produce high-quality data for researchers. The software platform is affordable, user-friendly, and accessible through various media devices. Zoom eliminates the need for travel, saving time and cost, and is well-suited for populations spread out geographically.

A study by Archibald et al. (2019) found that Zoom videoconferencing interviews were highly satisfactory compared to other interview methods, such as in-person, telephone, and other video conferencing services. Zoom was found to be a reliable tool for qualitative data collection, as it facilitates rapport between interviewer

and interviewee. The study also found that Zoom is a feasible and cost-effective platform for efficient qualitative data collection during interviews.

A researcher examined and analyzed quantitative data on the current preferences of users in academic libraries, as well as the cultural practices in library learning spaces. The researcher believes that the library may need new space and operational practices to meet the needs of the library's transformation. Based on the findings of the quantitative study, the researcher developed a set of interview questions to be answered by academic librarians via Zoom. The researcher is confident that the librarians will offer comprehensive insights into the issues and comprehend the overall learning space problems affecting library services, as well as provide recommendations on how the library can change.

The interview questions covered a wide range of topics related to the quantitative findings on the transformation of library space, the impact of noise on academic libraries, and the challenges faced by library staff in their daily work. The questions also explored the role of sound in shaping the library's image, the use of common learning spaces, and the experiences of library users. The librarians provided quantitative data collected during the interview on the topics of library transformation, learning spaces, noise levels, and best practices for supporting users.

The researcher also aimed to define on the preference practices of users in related to the current library implementation practices, tolerant and the gap in between actual The researcher planned to ask questions about the value of quiet in the academic library, as well as expectations for the library's appearance, sound, and usage. Questions about librarians' expectations for future library improvements based on the data collected from the quantitative and services would also be asked during the Zoom interview session.

To summarize, the researcher conducted a Zoom session with librarians to examine their opinions on the actual practices and preferences of patrons' use of space in academic libraries in Malaysia. The main purpose of this study was to gain a deeper understanding of librarians' perceptions of how to meet users' expectations while maintaining the unique and vital place of libraries in the academic landscape.

3.4.2 Population and Sampling Process in Qualitative

Creswell (2014) notes that qualitative interviews can be conducted in a variety of formats, including face-to-face, telephone, or focus group interviews. The number of participants in a qualitative interview is typically small, with 6 to 8 participants being the norm. Purposive sampling, as defined by Wimmer and Dominick (2014), is a non-probability sampling method in which participants are selected based on their knowledge or experience with a particular phenomenon. This type of sampling is often used in qualitative research, as it allows researchers to gather data from a small number of individuals. The sample size for purposive sampling is typically small, ranging from 6 to 12 participants.

The number of interviews needed for data collection is not fixed but rather depends on a number of factors, such as the research question, the number of participants, and the available time and resources (Bailey, 2014). Data collection can be discontinued once the researcher's themes or categories are well-structured, as new data will no longer provide new insights or reveal new properties (Charmaz, Askews, & Holts Library Services, 2014).

The study used a mixed-methodology approach with snowball sampling. The researcher initially contacted familiar librarians and then requested referrals from them for other experienced academic librarians who might be interested. Participants with diverse experiences and affiliations were sought to ensure a representative sample. All participants were experts in various library fields with at least four years of experience in academic libraries, and all were from the user services department. The researcher interviewed eight librarians and then discontinued the interviews when it became clear that the data collection was well-structured and that further interviews were no longer providing significant new information.

3.4.3 Participants Response in Qualitative

The researcher conducted a series of interviews over four months, from July 2022 to November 2022. Eight samples of data were successfully collected.

3.4.4 Data Analysis from Qualitative: Thematic Analysis

To analyze the qualitative data gathered from the interviews, the researcher utilized Atlas.ti, a software specifically designed for this purpose. The first step in the analysis process involved reading each interview script carefully to gain a deeper understanding of the interviewee's background and current situation. The coding process began with the first respondent and continued through to the eighth, with the researcher reading through each segment while assigning initial codes based on the research questions. The codes identified areas of interest from the quantitative data and related them to various topics, including user perceptions of the overall operation of academic library services, user behavior and preferences, noise levels, problems, and current and future library operations and activities. Overall, the use of Atlas.ti and the coding process allowed the researcher to develop a comprehensive understanding of the collected data.

During the coding process, the researcher made adjustments to the initial codes to accurately capture emerging themes and prevent overly general categories. To maintain consistency, the researcher also reviewed previous interviews and re-coded sections. Reports were created to identify interviews that discussed key themes such as learning spaces and collaboration. Afterward, the researcher re-read each segment and extracted relevant text, transcribing them into comment files. These excerpts were then compared against the original interview notes to ensure that they accurately represented the interviewee's experiences and the librarians' perspectives. To enhance the trustworthiness of the qualitative results, a two-pronged approach was employed. Triangulation was used by combining semi-structured interviews with the researcher's experience and consistent findings from other research. Member checking was also implemented by sharing the analyzed findings with participants for feedback. The convergence of these methods provided evidence of the findings' accuracy in reflecting the participants' realities.

3.4.5 Explication of Interviews

To ensure that research participants fully understand the nature of the study, all participants must sign and return the consent form to the researcher before the Zoom interview session. In order to protect the privacy of the study participants, the researcher has used pseudonyms to refer to them. These pseudonyms are not related to the participants' workplaces or positions, and they are simply labeled as "respondent 1," "respondent 2," and so on. The researcher has made every effort to avoid including any identifying information about the participants in the study. However, because the location of the study has not been anonymized, it is possible that someone could identify the real person behind the pseudonym. This has increased the researcher's gratitude and ethical responsibility towards the participants. The researcher apologizes in advance to anyone who may be identified too easily through this research. The researcher hopes that respect for these individuals shines through, even as they provide telling details about their experiences.

3.4.6 Interviewee Demographic

As part of the interview procedure, demographic details were collected from the participants before the interview began. The following questions were asked:

- Do you have a minimum of four years of work experience in an academic library?
- In which department of the library are you currently employed?
- All candidates met the sampling criteria, which required a minimum of four years of experience in an academic library.

3.4.7 Pilot Test

To optimize the efficiency of Zoom interview sessions, a pilot test was conducted with two librarians. The librarians provided positive feedback on the overall structure of the interview questions, indicating the success of the pilot test.

3.4.8 Limitation of Scope

Interview data will be recorded in words by researchers. However, some points may be omitted during the writing process.

3.5 OPERATIONAL DEFINITIONS

3.5.1 Independent Variable

Noise level <40 dB, <45 dB, <50 dB, and <55 dB:

Noise level, measured in decibels (dB), represents the intensity of sound. A library typically generates noise levels around 40 dB, while casual conversation at home produces noise levels closer to 50 dB. Office conversations often reach noise levels of approximately 60 dB.

Discourse Background Noise:

The research will focus on discourse background noise, which refers to noise generated by library users engaged in conversations or discussions, which is considered an unwanted sound in the vicinity of an academic library. Other noise sources will not be considered within the scope of this study.

Users Preference:

Academic library users' attitudes towards physical library services and desires regarding library design, noise management strategies, and the need for operational changes.

- Library setup design : This refers to the aesthetic preferences of users regarding the physical layout of the library, encompassing modern or traditional themes
- Noise alerting methods: This refers to the users' preferred approach for managing noise disturbances, either through human intervention or automated systems.

- Need for transformation in daily operations: This refers to user preferences regarding the preservation of current library services or the necessity of implementing changes to existing practices

3.5.2 Dependence Variable

Learning Ability:

Learning ability encompasses an individual's capacity to acquire, retain, recall, understand, and interpret information. This aligns with Bloom's Taxonomy, where level 1 assesses recall of information, while level 2 evaluates understanding and interpretation.

3.6 SUMMARY

This chapter outlines the research methodology. It covers the study population, sampling techniques, research instruments, data collection procedures (including pre- and post-tests and interviews), data analysis methods, and a brief overview of participant responses. A pilot test is also discussed. The chapter concluded with a discussion of the pilot test. The next chapter will discuss the data analysis in more detail.

CHAPTER FOUR

DATA ANALYSIS

4.1 OVERVIEW

The researcher investigated the preferences, anxieties, and uncertainties of users and librarians regarding the transformation of libraries into learning spaces. The researcher intended to study in depth the phenomenon of users' acceptance levels of modern collaborative learning space in common area libraries. If the need a news metaphor for the library. It is essential to examine the level of acceptance with various antecedents if the library is transforming into a modern library. The data collected from the quantitative will build to further interview questions.

In the findings, the librarians were anxious about the change of library to modern and for collaborative learning. Librarians related it to the library culture clash. The collected data show that the culture clash is closely related to the noise problem and the acceptance of users toward the sociability are part of the essential in library physical services.

Users' study habits are closely related to the need for transformation in the library physical learning space. The transformation of the library to a collaborative space will increase the level of noise and will effect the learning abilities of users in the library.

The study aims to explore the course effect relationship in the physical learning space transformation and confirm the predations related to the hierarchy of learning space attribute model with users' preference and librarians.

The areas involved in the collaborative modern library which is closely related to the noise problem, the effect of noise on learning ability, the standard of noise level suitable to be allowed in the general area of the library, patron's attitudinal and behavior in loyal towards modern and collaborative library. The following are the areas to be explored.

- To determine the most suitable noise level for academic library users, to explore the impact of discourse background noise levels on learning ability. The study investigated the effects of discourse noise levels on users' reading comprehension scores and learning ability scores in reading. The study examined three different levels of discourse noise: <45dB, <50dB, and < 55 dB.
- The relationship between library users' preference settings, noise alerting methods, discourse noise levels, and users' learning ability scores was investigated. Specifically, examined whether discourse noise level, library users' preference settings, noise alerting methods, and users' learning ability scores were significantly different.
- To define the most preferred library setup, noise alerting methods, and attitudinal and behavioral loyalty of users in academic libraries in Malaysia towards the collaborative modern learning space with the automatic noise monitoring device guide at library common space.

4.2 DATA ANALYSIS

4.2.1 Screening and Cleaning Quantitative Data

Data was collected between March and June 2022 to inform the development of interview questions. A total of 384 completed questionnaires were analyzed using SPSS software. A thorough data cleaning process was conducted to identify and rectify any errors and ensure data accuracy.

4.2.2 Survey Respondent Behavior and Descriptive Analysis

This section provides a demographic breakdown of the 384 library users surveyed at HLI. The sample was balanced, with 183 males (47.7%) and 201 females (52.3%). There were 35.4% (136 users) who regularly visited the library 1-5 times in a regular semester, 37.8% (145 users) 6-10 times, and 26.8% (103 users) 11 times and more.

Throughout the research experimental process, the researcher observed that all 384 participants cooperated and appeared comfortable during the experiment. The participants' willingness and lack of discomfort suggest that the data they provided reflects their natural and unbiased responses.

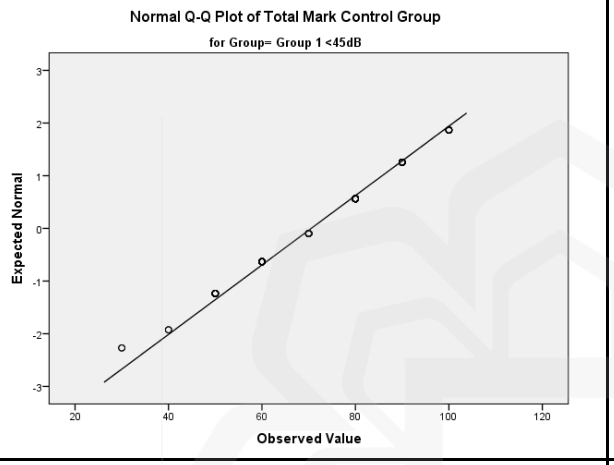
4.2.3 Normality of Quantitative Data

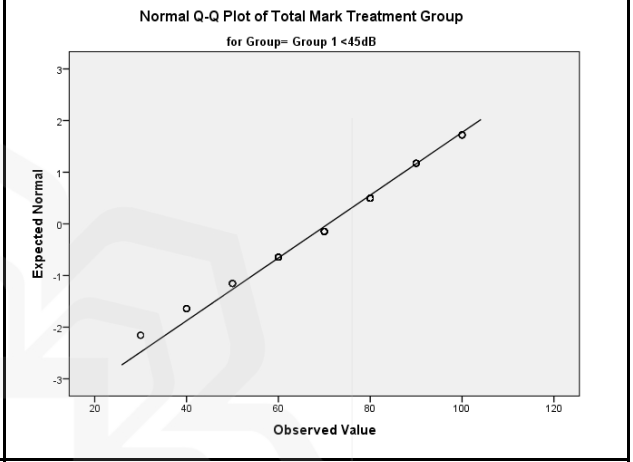
The normality of the test was carried out on each item, and assessed statistically and graphically. The fist and main statistics used by the researcher were skewness and kurtosis. Mark score collected from the experiment and data collected from the Likert scale were considered reasonable and normal as the variables fell within the range between -1.96 to +1.96 results. Chua (2013) highlighted that variables fell within the range between -1.96 to +1.96 resultsare consistent with the recommended ranges for normally distributed data. The values of Skewness and Kurtosis for control and experimental groups 1,2,3 are stated in Table 4.1.

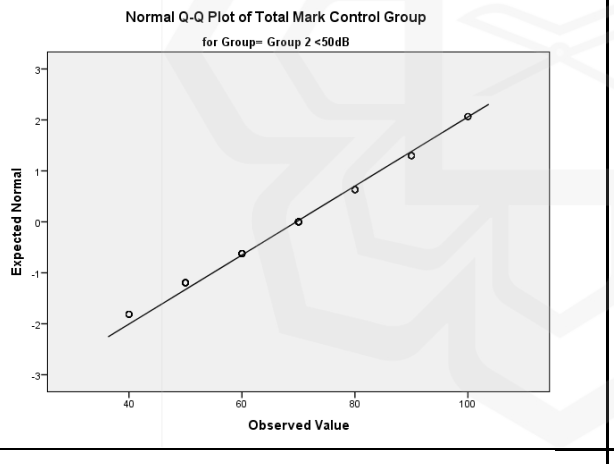
Table 4.1 Normality of Data Value of Skewness and Kurtosis for control and experimental group 1, group 2, and group 3

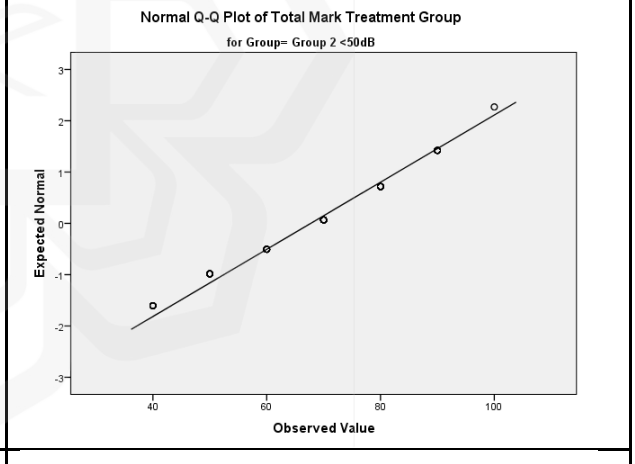
Item	N	Minimum	Maximum	Mean	Std.Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std.Error
Total Mark Control Group (Group 1)	128	30	100	70.55	15.179	-.190	.214	-.264	.214
Total Mark Treatment (Group 1)	128	30	100	70.86	16.459	-.323	.214	-.216	.425
Total Mark Control Group (Group 2)	128	40	100	69.61	14.763	-.126	.214	-.503	.425

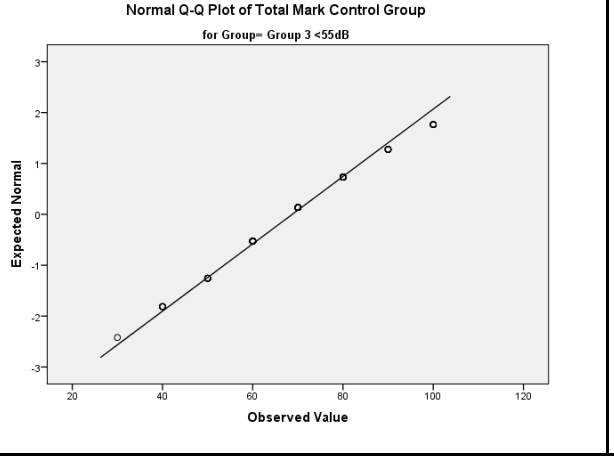
Total Mark Treatment Group (Group 2)	128	40	100	67.73	15.278	-.202	.214	-.694	.425
Total Mark Control Group (Group 3)	128	30	100	68.75	15.111	.174	.214	-.143	.425
Total Mark Treatment Group 3 55dB	128	30	100	62.42	14.728	.248	.214	.138	.425

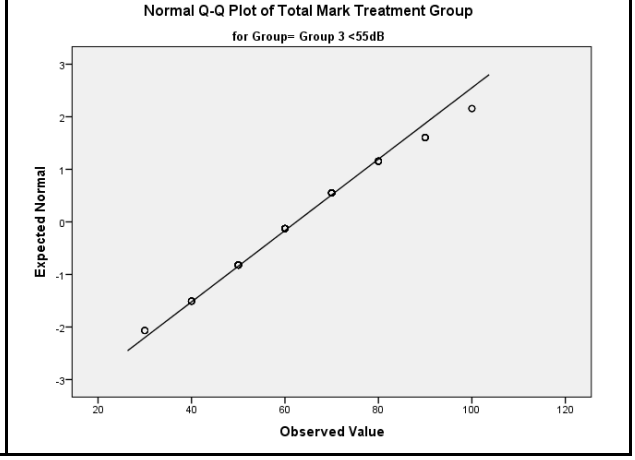












The normal Q-Q plot indicates that the collected data points closely align with the theoretical normal distribution, suggesting that the data is normally distributed. This is evident from the points falling near a straight line on the plot.

The histogram revealed a normal distribution of the data, characterized by a high frequency of occurrences in the middle and a low frequency at the extremes.

4.2.4 Reliability Statistics for Quantitative Data

To assess data reliability, a Pearson correlation analysis was performed on each individual group. The results revealed consistent test-retest correlations for reading comprehension across varying noise levels (<45dB, <50dB, and <55dB) among a group of 128 subjects (N=128). Specifically, the correlations were 0.616, 0.712, and 0.728, respectively. The statistical analysis revealed a significant difference ($p < 0.05$) in the scores, indicating that the instrument is valid for collecting reliable data from individuals with similar characteristics to the study participants.

Table 4.2 Reliability Statistics Correlations

		Group1_40	Group1_45	Group2_40	Group2_50	Group3_40	Grroup3_55
Group1_40	Pearson Correlation	1	.616**	.040	-.059	.096	.029
	Sig. (2-tailed)		.000	.657	.507	.283	.743
	N	128	128	128	128	128	128
Group1_45	Pearson Correlation	.616**	1	.034	-.033	.027	-.048
	Sig. (2-tailed)	.000		.705	.712	.766	.593
	N	128	128	128	128	128	128
Group2_40	Pearson Correlation	.040	.034	1	.712**	.083	.015
	Sig. (2-tailed)	.657	.705		.000	.355	.864
	N	128	128	128	128	128	128
Group2_50	Pearson Correlation	-.059	-.033	.712**	1	.025	-.021
	Sig. (2-tailed)	.507	.712	.000		.778	.815
	N	128	128	128	128	128	128

Group3_40	Pearson Correlation	.096	.027	.083	.025	1	.728**
	Sig. (2-tailed)	.283	.766	.355	.778		.000
	N	128	128	128	128	128	128
Grroup3_55	Pearson Correlation	.029	-.048	.015	-.021	.728**	1
	Sig. (2-tailed)	.743	.593	.864	.815	.000	
	N	128	128	128	128	128	128

**. Correlation is significant at the 0.01 level (2-tailed).

4.3 ANALYSIS RESULT

4.3.1 Research Question 1

Research question 1 : "What are the optimal design elements for academic library learning spaces that cater to user preferences while mitigating discourse noise-induced distractions, and how does the relationship between learning ability and preferred noise levels (40dB, 45dB, 50dB, 55dB) influence these design considerations? The aim is to identify the ideal design elements for library study spaces that cater to user preferences and minimize noise distractions. To address this question, we will break it down into four sub-questions.

4Q1.1Is there any significant difference between learning ability at different discourse background noise levels in determining the most suitable level among the academic library users? Does the level of discourse noise (below 45dB, 50dB, and 55dB) significantly impact users' reading comprehension scores, and what is the optimal noise level for maximizing learning ability?

This research sub-question examines the following:-

4Q1.1(a) Does the discourse noise levels of <45dB affect users' reading comprehension score?

Null Hypothesis :

The noise level<45dB in academic library does not affect the users' reading comprehension score.

Research Hypothesis :

The noise level<45dB in academic library affect the users' reading comprehension score.

A paired-samples t-test was used to examine whether academic library users' reading comprehension scores differed under two noise levels: <40 decibels and <45 decibels. The same participants completed a reading comprehension test before and after exposure to each noise level.

There was no significant difference in users' reading comprehension scores before <40dB (M=70.55, SD=15.179) and after <45dB (M=70.86, SD=16.459) conditions; t (127)=.254, p=.800. The researcher accepted the null hypothesis as P(0.800)>0.05, not significant. These results suggest that the users' reading comprehension score in the academic library is not affected by the background interaction noise at the level of <45dB. (see Table 4.3 and Table 4.4).

Table 4.3 Paired Samples Statistics for Control and Experimental Group 1

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Total Mark Control Group	70.55	128	15.179	1.342
	Total Mark Treatment Group	70.86	128	16.459	1.455

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Total Mark Control Group & Total Mark Treatment Group	128	.616	.000

Table 4.4 Paired Samples Test for Control and Experimental Group 1

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Total Mark Control Group - Total Mark Treatment Group	-.313	13.914	1.230	-2.746	2.121	-.254	127	.800

4Q1.1(b) Does the discourse noise levels of <50dB affect users' reading comprehension score?

This section analyses the academic library users' reading comprehension score at the noise level of 50dB. The differences with the users' reading comprehension scores obtained from the pre-test and post-test conducted in a true experimental process are compared. The hypotheses are as follow: P(0.065)>0.05 Not Significant, Accept Null Null Hypothesis:

The discourse noise level of <50dB in academic libraries does not affect the users' reading comprehension score.

Research Hypothesis:

The discourse noise level of <50dB in the academic library affects the users' reading comprehension score.

A paired-samples t-test was conducted to compare the academic library users' reading comprehension scores before a noise level of <40dB and after 50dB condition. The data collected from the same participants showed a reading comprehension score on the pre-test and post-test.

There was no significant difference in users' reading comprehension score before <40dB (M=69.61, SD=14.763) and after <50dB (M=67.73, SD=15.278) conditions; t (127)=1.858, p=.065. The researcher accepted the null hypothesis as P(0.065>0.05), not significant. These results suggest that the users' reading comprehension score in the academic library is not affected by the background interaction noise at the level of 50dB. (see Table 4.5 and Table 4.6).

Table 4.5 Paired Samples Statistics for Control and Experimental Group 2

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Total Mark Control Group	69.61	128	14.763	1.305
	Total Mark Treatment Group	67.73	128	15.278	1.350

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Total Mark Control Group & Total Mark Treatment Group	128	.712	.000

Table 4.6 Paired Samples Test for Control and Experimental Group 2

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Total Mark Control Group - Total Mark Treatment Group	1.875	11.416	1.009	-.122	3.872	1.858	127	.065

4Q1.1(C) Does the discourse noise levels of <55dB affect users' reading comprehension score?

This section analyses the academic library users' reading comprehension score at the noise level of <55dB The differences with the users' reading comprehension scores obtained from the pre-test and post-test conducted in true experimental process are compared. The hypotheses are as follows:

Null Hypothesis:

The discourse noise level of <55dB in academic libraries does not affect the users' reading comprehension score.

Research Hypothesis:

The discourse noise level of <55dB in the academic library affects the users' reading comprehension score.

A paired-samples t-test was conducted to compare the academic library users' reading comprehension scores before a noise level of <40dB and after 55dB condition. The data collected from the same participants showed a reading comprehension score on the pre-test and post-test. P(0.000)<0.05, Significant, Reject Null

There was a significant difference in users' reading comprehension score before <55dB (M=68.75, SD=15.111) and after <55dB (M=62.42, SD=14.728) conditions; t (127)= 6.507, p=.000. The researcher rejects the null hypothesis and accepted the research hypothesis as P(0.000<0.05), significant. These results suggest

that the users' reading comprehension score in academic libraries is affected by the background interaction noise at the level of < 55 dB. (see Table 4.7 and Table 4.8).

Table 4.7 Paired Samples Statistics for Control and Experimental Group 3

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Total Mark Control Group 55dB	68.75	128	15.111	1.336
	Total Mark Treatment Group 55dB	62.42	128	14.728	1.302

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Total Mark Control Group & Total Mark Treatment Group 55dB	128	.728	.000

Table 4.8 Paired Samples Test for Control and Experimental Group 3

Paired Samples Test									
		Paired Differences 55dB					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Total Mark Control Group - Total Mark Treatment Group 55dB	6.328	11.003	.973	4.404	8.253	6.507	127	.000

4Q1.1(d) Does the users' learning ability score in reading differ before and after the 3 different levels of discourse noise as <45dB, <50dB and < 55dB in defining the most suitable noise level and learning ability?

A one-way ANOVA was conducted to determine if there was a significant difference in reading comprehension among library users exposed to varying background noise levels. This study aimed to identify the optimal noise level for academic libraries to support effective learning. The hypotheses were as follows:

Null hypothesis:

There is no difference in the reading score of the users while reading in <45dB, <50dB, and <55dB as 3 different discourse noise levels.

Research Hypothesis:

There is a difference in the reading score of the users while reading in <45dB, <50dB, and <55dB as 3 different discourse noise levels.

A one-way ANOVA was conducted to compare the effect of academic library users' reading comprehension score on discourse noise levels for <45dB, <50dB, and <55dB conditions.

A Levene test for homogeneity of variances was undertaken to ensure that the homogeneity assumption has not been violated, p>.05. Levene test shows that it is non-significant as p> 0.05 (p=0.553) for the comparison of these three variances, so it is confident that the variances for each group are approximately equal and it is proven that the assumption of equal variance is not rejected. The interpretation of the ANOVA can be processed further (see Table 4.9).

Table 4.9 Test of Homogeneity of Variances Total Score for Control and Experimental

Descriptives: Statistic for One-Way ANOVA								
Total Mark Control and Treatment								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Group 1 <45dB	128	141.41	28.443	2.514	136.43	146.38	80	200
Group 2 <50dB	128	137.34	27.792	2.457	132.48	142.20	80	190
Group 3 <55dB	128	131.17	27.740	2.452	126.32	136.02	70	200
Total	384	136.64	28.237	1.441	133.81	139.47	70	200

Test of Homogeneity of Variances			
Total Mark			
Levene Statistic	df1	df2	Sig.
.593	2	381	.553

The on-way ANOVA test results obtained through the SPSS program were also identical to the scores obtained from different groups. There was a significant effect of academic library users' reading comprehension score (IV) on 3 different levels of discourse noise remembered at the P< 0.05 level for the three conditions [F (2,381)= 4.338, p = 0.014], and the null hypothesis is rejected.

The ANOVA test shows that there is a difference in the reading score of the users while reading in <45dB, <50dB, and <55dB conditions as 3 different discourse noise levels. To summarize, the average grades were found to be different across methods, F (2, 381) = 4.338, p= 0.014, which is significant as shown in Table 4.10.

Table 4.10 ANOVA Total Score for Control and Experimental Groups

ANOVA					
Total_Mark					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6798.438	2	3399.219	4.338	.014
Within Groups	298567.969	381	783.643		
Total	305366.406	383			

Thus, further investigation using multiple comparisons can be performed using Tukey's HSD test to define where the significance lies and to know whether a significant difference in learning ability in reading comprehension exists between discourse noise levels. There are three possible comparisons G1 versus G2, G1 versus G3, and G2 versus G3 in comparing all possible pairs of means.

The first comparison is G1 versus G2. The means difference (Std Error) is 4.063(3.499), The p-value testing the null hypothesis, P = 0.477, and the 95% confidence interval is (-4.17, 12.30). This indicates that means difference is no statistically significant difference between the means of G1 and G2.

The second comparison is G1 versus G3. The means difference (Std Error) is 10.234 (3.499), the p-value testing the null hypothesis. of no differences in p=0.010, and the 95% confidence interval is (2.00,18.47) This indicates that there is a

statistically significant difference between the means for the standard of G1 and G3 which means that group 1 at the 45dB noise level displays better means different than group 2(<50dB) and group 3 (<55dB). This is the only statistically significant in this table, as an asterisk(*) beside the means difference in Table 4.11.

The third comparison is G2 versus G3. The means difference (Std Error) is 6.172(3.499), The p-value testing the null hypothesis, P = 0.183, and the 95% confidence interval is (-2.06, 14.41). This indicates that means difference is no statistically significant difference between the means of G2 and G3.

To summaries, the overall AVOVA table results reported that at the p=0.014 level of significance, there was at least one means that was difference from another. The post hoc Turkey (performed at the 0.05 level for significant) examined all possible pairwise comparisons and determined that there was a statistically significant difference in the mean scores of the G1 versus G3. Specifically, the G1(<45dB) noise level seems to have a better average reading score than the G3 (<55dB) noise level. And G1 (<45dB) and G2(<50dB) and G2 (<50dB) and G3 (,55dB) form a homogeneous subset whose means are not significantly different from one another.

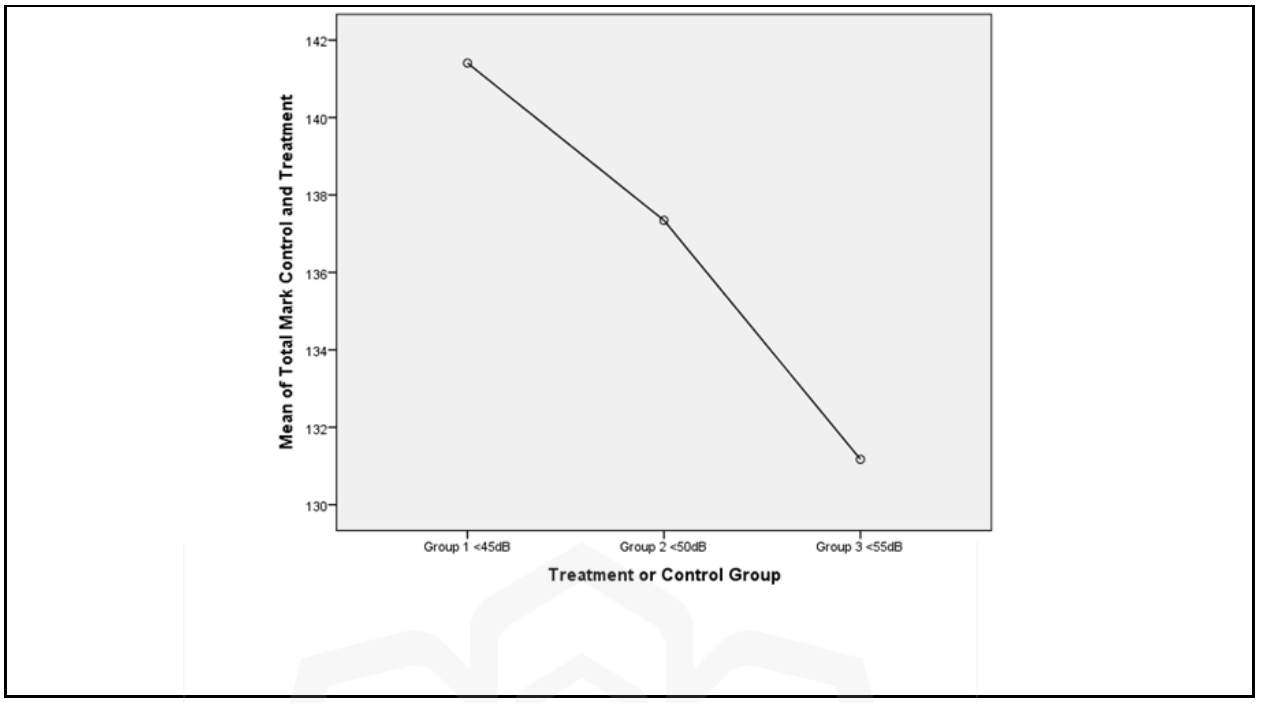
Table 4.11 Multiple Comparisons

Dependent Variable: Total_Mark for Experimental Group and Control Group

Tukey HSD

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1<45dB	2<50dB	4.063	3.499	.477	-4.17	12.30
	3<55dB	10.234*	3.499	.010	2.00	18.47
2<50dB	1<45dB	-4.063	3.499	.477	-12.30	4.17
	3<55dB	6.172	3.499	.183	-2.06	14.41
3<55dB	1<45dB	-10.234*	3.499	.010	-18.47	-2.00
	2<50dB	-6.172	3.499	.183	-14.41	2.06

*. The mean difference is significant at the 0.05 level.



4.3.2 RESEARCH QUESTION 2

Research question 2: "What are the key gaps between the current state of learning spaces in Malaysian academic libraries and the changing needs and preferences of library users, and how can these gaps be addressed through redesign efforts to influence user behavior and improve library management practices? The main is to **understand the differences between current library spaces and the evolving needs of Malaysian library users.** To address this question, we will break it down into six sub-questions.

4Q1.2 What are the preferred library setups and noise-alerting methods among academic library users in Malaysia, and how do these preferences indicate the need for library transformation?

This research sub-question examines the following:-

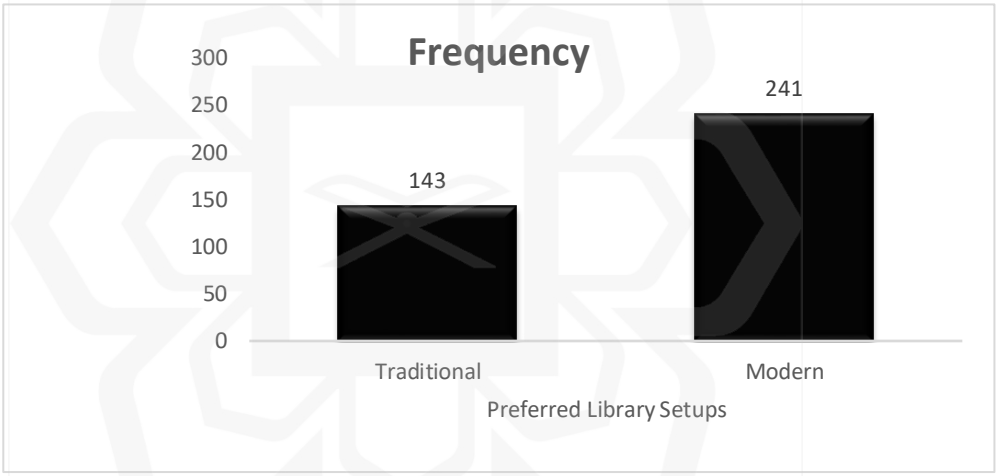
4Q1.2 (a) What are the most preferred library setups by users in academic libraries in Malaysia?

Description statistics are used to summarize the users' preference for library setup design in academic libraries, either in the traditional setup design or modern set up design.

The results show that 62.8% of the respondents prefer the academic library to be set up as modern design and 37.2% of the respondents prefer the academic library to be set up with a traditional design. This provides evident to suggest that the learning space design in the library needs to transform into the modern setup design (see Table 4.12)

Table 4.12 Preference Library Set Up in Academic Library

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Traditional	143	37.2	37.2	37.2
	Modern	241	62.8	62.8	100.0
	Total	384	100.0	100.0	

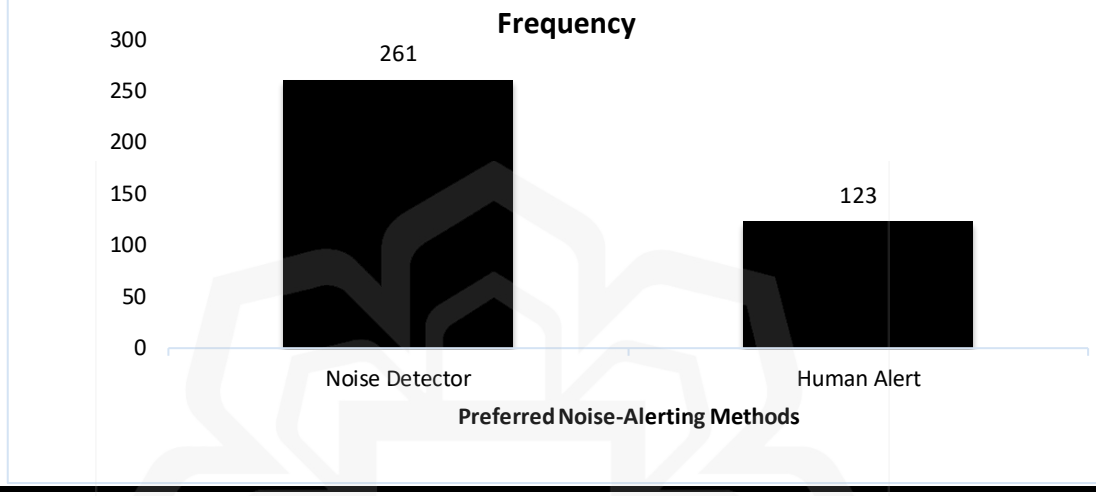


4Q1.2 (b) What are the most preferred noise-alerting methods used by users in academic libraries in Malaysia?

Description statistics are used to summarize the users' preference for noise alerting methods in the library, either using a noise detector machine as alerting or alerting by library working staff.

Table 4.13 Preference Noise Alerting Methods in Academic Library

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Noise Detector	261	68.0	68.0	68.0
	Human Alert	123	32.0	32.0	100.0
	Total	384	100.0	100.0	



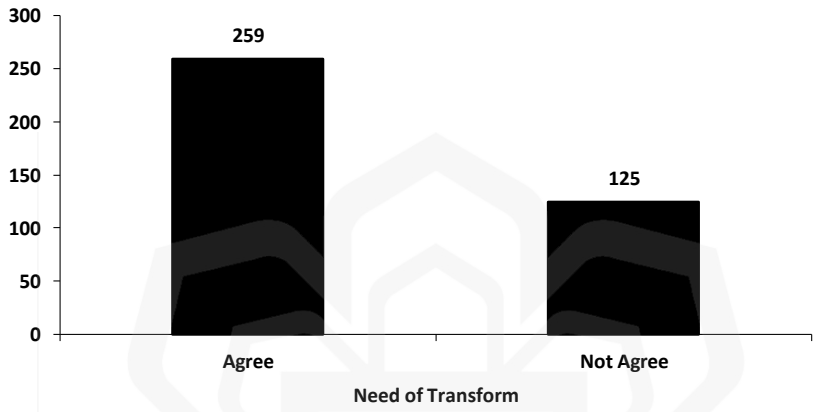
The results show that 68% of the respondents prefer noise detector to control and alert the noise problem in an academic library. 32% of the respondents prefer the noise control tasks to be carried out by the working staff in the library. This has provided evidence to suggest that the installation of a noise detector machine in library learning space is preferable by users. (see Table 4.13)

4Q1.2 (c) Do academic libraries need to transform?

Description statistics are used to summarize the users' opinions toward the need for transformation in academic libraries, either to maintain the current situation practices or to transform what is needed in an academic library.

Table 4.14 The Need of Transform in Academic Library

Need Transform					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	259	67.4	67.4	67.4
	Not Agree	125	32.6	32.6	100.0
	Total	384	100.0	100.0	



The results show that 67.4% of the respondents responded that the library should transform and 32.6% of the respondents responded that the library should remain as current practices. This provides evident to suggest that the transformation of the overall operation of the academic library is needed (see Table 4.14).

4Q1.3 Do library users' preferences for noise levels, alerting methods, and library setup significantly influence their learning ability scores, and is the need for library transformation related to these factors? Does the discourse noise level influence the users' reading comprehension score? How does the interaction between library users' preferred setups and discourse noise levels affect their reading comprehension scores?

This research sub-question examines the following:-

4Q1.3 (a) Does a user's learning ability and preferred library environment impact their reading comprehension, particularly when considering the level of noise present?

Two-way between-group ANOVA was undertaken to identify statistically significant means differences between the users' preference of academic library setup design in related to the user's learning ability in reading at difference noise levels. The mean difference between groups on learning ability score at difference noise levels have been split into two subject factors, academic library set up design on traditional and modern.

It is to understand if there is an interaction between two difference noise levels and users' preference setup (independent variable) on the reading score (dependent variable). The purpose is to understand whether there is an interaction between noise levels and users; preference set up on the learning ability in reading among the users in an academic library.

Table 4.15 Descriptive Statistics at Total Mark and Preference Set Up

Descriptive Statistics				
Dependent Variable: Total_Mark				
Group	Preference_Set_UP	Mean	Std. Deviation	N
1<45dB	Traditional	137.92	27.979	48
	Modern	143.50	28.689	80
	Total	141.41	28.443	128
2<50dB	Traditional	132.77	30.695	47
	Modern	140.00	25.788	81
	Total	137.34	27.792	128
3<55dB	Traditional	130.42	22.404	48
	Modern	131.63	30.624	80
	Total	131.17	27.740	128
Total	Traditional	133.71	27.210	143
	Modern	138.38	28.742	241
	Total	136.64	28.237	384

Table 4.16 Levene's Test of Equality for Total Mark And Preference Set Up

Levene's Test of Equality of Error Variances			
Dependent Variable: Total_Mark			
F	df1	df2	Sig.
2.166	5	378	.057
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.			
a. Design: Intercept + Group + Preference_Set_UP + Group * Preference_Set_UP			

The Levene's test result shows that the homogeneity of variance assumption has not been violated. The output illustrates that the main effects for different levels of noise and preference library set up are not significant (p>.05) p=0.057. Therefore, neither different levels of noise nor preference library set up significantly influence the learning ability in reading. In other words, the different levels of noise or preference library set up did not have a significant impact on the learning ability in reading.

Table 4.17 Test of Between-Subject Effects: Total Mark and Preference Set-Up

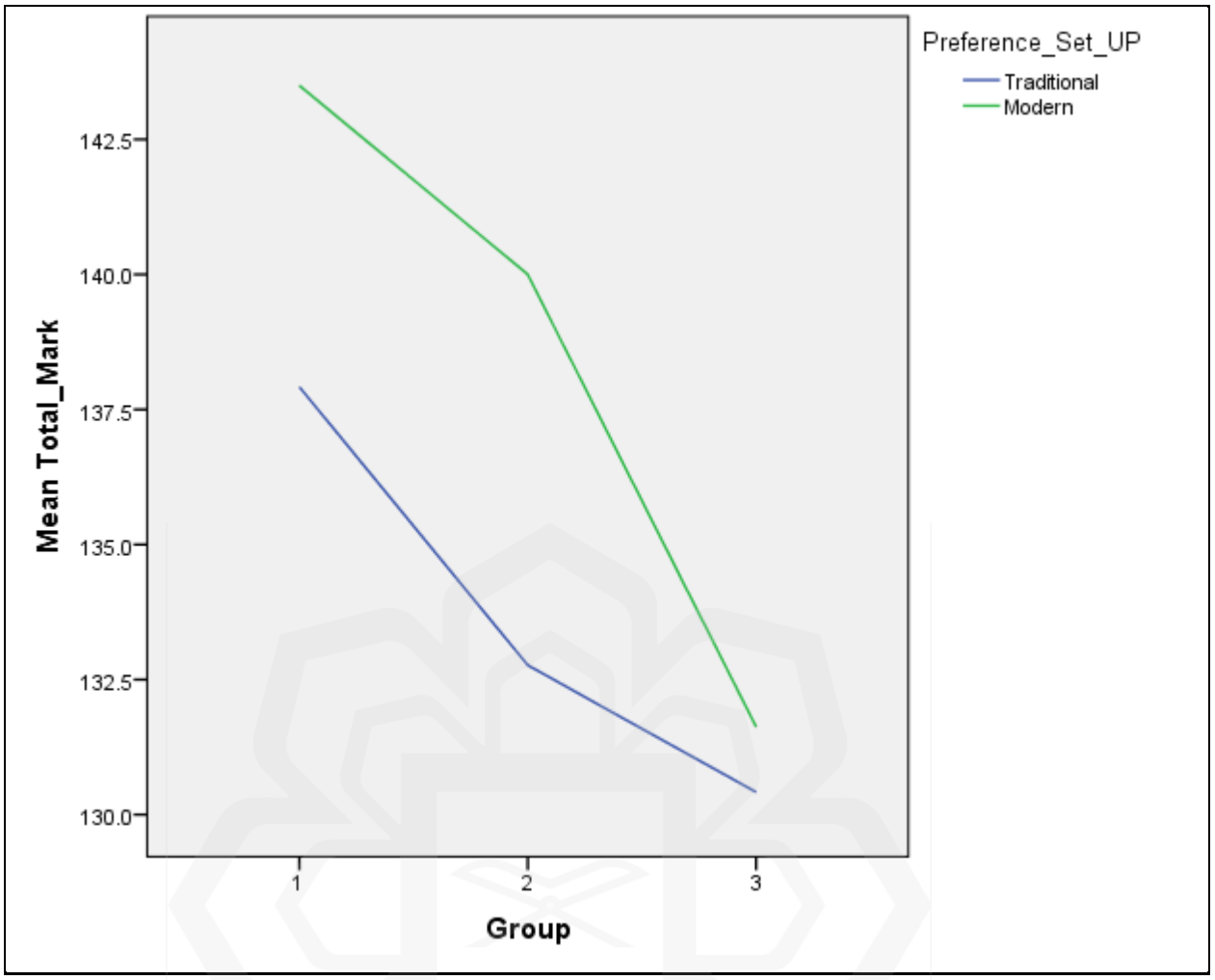
Tests of Between-Subjects Effects

Dependent Variable: Total_Mark

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	9333.897[a]	5	1866.779	2.384	.038	.031	11.918	.758
Intercept	6643026.473	1	6643026.473	8482.393	.000	.957	8482.393	1.000
Group	5652.235	2	2826.117	3.609	.028	.019	7.217	.666
Preference_Set_UP	1961.537	1	1961.537	2.505	.114	.007	2.505	.352
Group * Preference_Set_UP	580.054	2	290.027	.370	.691	.002	.741	.109
Error	296032.509	378	783.155					
Total	7474900.000	384						
Corrected Total	305366.406	383						

a. R Squared = .031 (Adjusted R Squared = .018)

b. Computed using alpha = .05



The output shows that there is not significant statistical and significant interaction effect in between Group * Preference_Set_UP in the library. There is F(2,378)=0.370, as_ 0691>0.05 (p=0.691),

The statistical result also shows that they are significant statistical difference means in total mark between noise levels at <45dB, <50dB, and <55dB, 0.28<0.05 (p=0.28). However, they were no statistically significant means in total mark between traditional and modern preference set up.

4Q1.3(b) How do library users' preferences for noise control methods, learning abilities, and noise levels interact to influence reading comprehension scores?

It is to understand if there is an interaction between difference noise levels and users' preference for noise alerting methods (independent) on the reading score (dependent variable). The purpose is to understand whether there is an interaction between

difference noise levels and users' preference for noise alerting methods on the learning ability in reading among users in academic libraries.

Table 4.18 Descriptive Statistics: Total Mark And Users' Preference of Noise Alerting Methods

Descriptive Statistics				
Dependent Variable: Total_Mark				
Group	Noise_Alert	Mean	Std. Deviation	N
1	Noise Detector	145.48	28.682	84
	Human Alert	133.64	26.597	44
	Total	141.41	28.443	128
2	Noise Detector	138.44	29.142	90
	Human Alert	134.74	24.466	38
	Total	137.34	27.792	128
3	Noise Detector	130.46	27.615	87
	Human Alert	132.68	28.286	41
	Total	131.17	27.740	128
Total	Noise Detector	138.05	29.029	261
	Human Alert	133.66	26.342	123
	Total	136.64	28.237	384

Table 4.19 Levene's Test of Equality: Total Mark and Users' Preference of Noise Alerting Methods

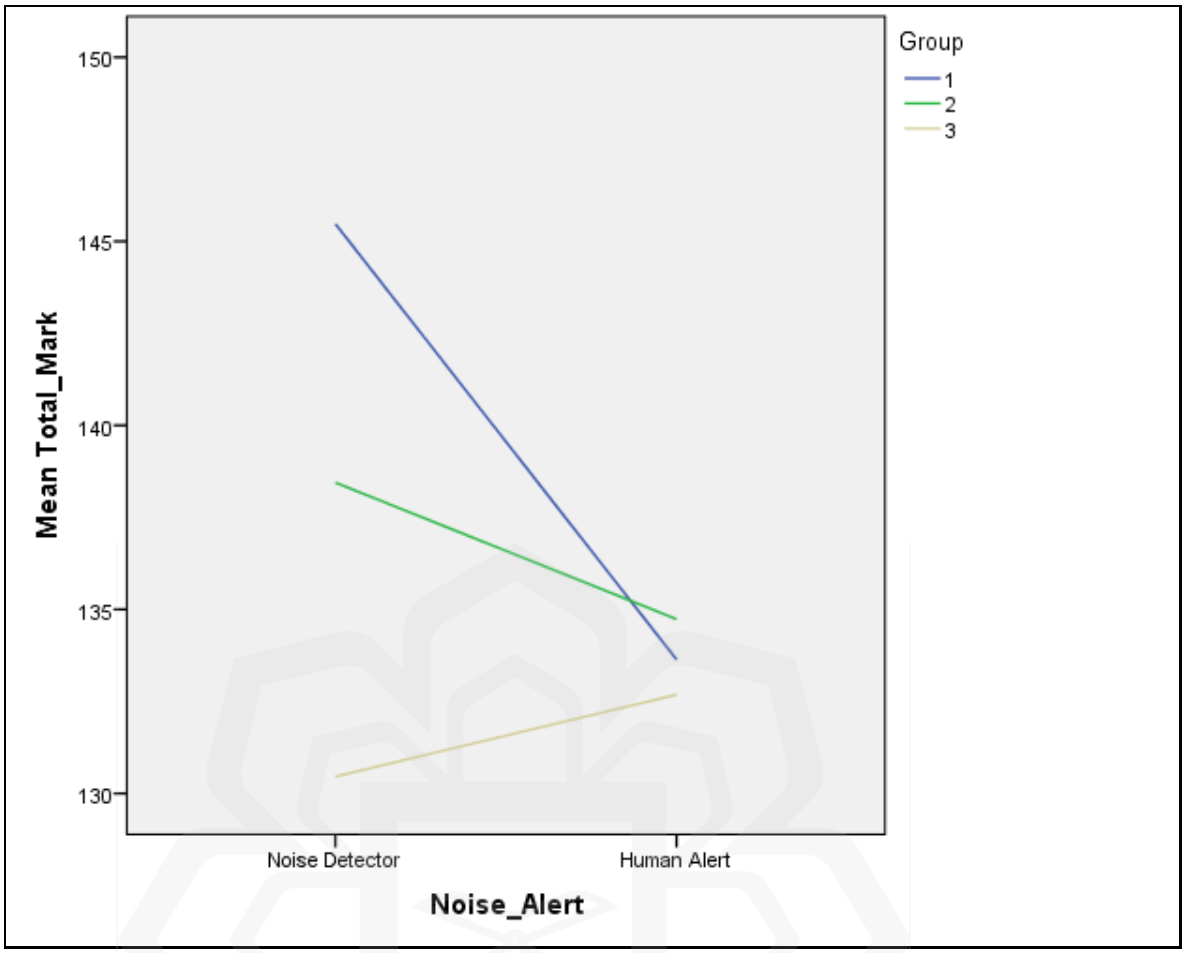
Levene's Test of Equality of Error Variances			
Dependent Variable: Total_Mark			
F	df1	df2	Sig.
.474	5	378	.796
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.			
a. Design: Intercept + Group + Noise_Alert + Group * Noise_Alert			

The Levene's test result shows that the homogeneity of variance assumption has not been violated. The output illustrates that the main effects for different levels of noise and users' preference of noise alerting methods are not significant ($p>0.05$), $P=0.796$. Therefore, neither different levels of noise nor preference for noise alerting

methods significantly influences the learning ability in reading. In other words, different levels of noise or preference of noise alerting methods did not have a significant impact on learning ability in reading.

Table 4.20 Between Subject Effects: Total Mark and Users' Preference of Noise Alerting Methods

Tests of Between-Subjects Effects								
Dependent Variable: Total_Mark								
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	11351.194[a]	5	2270.239	2.919	.013	.037	14.594	.850
Intercept	6160048.227	1	6160048.227	7919.652	.000	.954	7919.652	1.000
Group	3683.085	2	1841.542	2.368	.095	.012	4.735	.478
Noise_Alert	1644.716	1	1644.716	2.115	.147	.006	2.115	.306
Group * Noise_Alert	2831.842	2	1415.921	1.820	.163	.010	3.641	.380
Error	294015.212	378	777.818					
Total	7474900.000	384						
Corrected Total	305366.406	383						
a. R Squared = .037 (Adjusted R Squared = .024)								
b. Computed using alpha = .05								



The output shows that there is not significant statistical interaction effect between Group * Noise_Alertmthoed in library. There is F(2,378)=1.820, as 0.163>0.05 (p=0.163) .

4Q1.3(c) How do library users' preferences for library transformation, learning abilities, and noise levels interact to influence reading comprehension scores?

Table 4.21 Descriptive Statistics: Total Mark and Users' Preference on the Need for Transformation

Descriptive Statistics				
Dependent Variable: Total Mark				
Group	Need Transform	Mean	Std. Deviation	N
1<45dB	Agree	139.60	28.162	75

	Not Agree	143.96	28.912	53
	Total	141.41	28.443	128
2<50dB	Agree	138.18	27.604	99
	Not Agree	134.48	28.734	29
	Total	137.34	27.792	128
3<55dB	Agree	129.18	29.729	85
	Not Agree	135.12	23.132	43
	Total	131.17	27.740	128
Total	Agree	135.64	28.731	259
	Not Agree	138.72	27.179	125
	Total	136.64	28.237	384

Table 4.22 Levene's Test of Equality: Total Mark and Users' Preference on the Need Transformation

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Levene's Test of Equality of Error Variances[a]			
Dependent Variable: Total_Mark			
F	df1	df2	Sig.
.611	5	378	.691
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.			
a. Design: Intercept + Group + Need Transform + Group * Need Transform			

Levene's test result shows that the homogeneity of variance assumption has not been violated. The output illustrates that the main effects for different levels of noise and users' preference on the need for transformation in the library are not significant ($p>0.05$), $P=0.691$. Therefore, neither different levels of noise nor users' preference for the need for transformation in the library significantly influences the learning ability in reading. In other words, different levels of noise or users' preference for the need for transformation did not have a significant impact on learning ability in reading.

Table 4.23 Tests of Between-Subjects Effects: Total Mark and Users' Preference on the Need Transformation

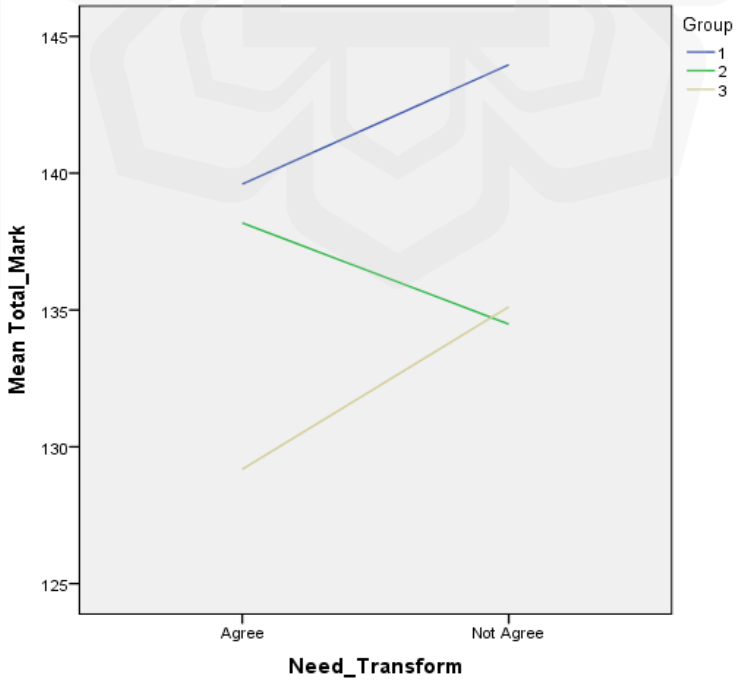
Tests of Between-Subjects Effects

Dependent Variable: Total_Mark

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	8703.742[a]	5	1740.748	2.218	.052	.029	11.090	.723
Intercept	6021636.852	1	6021636.852	7672.616	.000	.953	7672.616	1.000
Group	5569.008	2	2784.504	3.548	.030	.018	7.096	.658
Need_Transform	389.961	1	389.961	.497	.481	.001	.497	.108
Group * Need_Transform	1303.974	2	651.987	.831	.437	.004	1.661	.192
Error	296662.665	378	784.822					
Total	7474900.000	384						
Corrected Total	305366.406	383						

a. R Squared = .029 (Adjusted R Squared = .016)

b. Computed using alpha = .05



The output shows that there is not and without significant statistical interaction effect in between Group * Preference need of transform in the library. There is F(2,378)=0.831, as 0.437>0.05 (p=0.437). The statistical result also shows that there are no statistically significant means in total mark between users preference need of transform in the library as 0.481>0.05 (P=0.481).

4Q1.3(d) How do library users' preferences for library transformation, library setup design, and learning abilities interact to influence reading comprehension scores?

Table 4.24 Descriptive Statistics: Total Mark, Need Transform, and Preference Set-Up

Descriptive Statistics				
Dependent Variable: Total_Mark				
Need_Transform	Preference_Set_UP	Mean	Std. Deviation	N
Agree	Traditional	129.09	27.349	44
	Modern	136.98	28.884	215
	Total	135.64	28.731	259
Not Agree	Traditional	135.76	27.033	99
	Modern	150.00	25.140	26
	Total	138.72	27.179	125
Total	Traditional	133.71	27.210	143
	Modern	138.38	28.742	241
	Total	136.64	28.237	384

Table 4.25 Levene's Test of Equality: Total Mark, Need Transform and Preference Set Up

Levene's Test of Equality of Error Variances[a]			
Dependent Variable: Total_Mark			
F	df1	df2	Sig.
.105	3	380	.957
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.			
a. Design: Intercept + Need_Transform + Preference_Set_UP + Need_Transform * Preference_Set_UP			

Levene's test result shows that the homogeneity of variance assumption has not been violated. The output illustrates that the main effects of users preference set up and users' preference on the need for transformation in the library are not significant ($p>0.05$), $P=0.957$. Therefore, neither user's preference set up nor users' preference on the need of transformation in the library significantly influences the learning ability in reading. In other words, users preference set up or users' preference on the need for transformation did not have a significant impact on learning ability in reading.

Table 4.26 Tests of Between-Subjects Effects: Total Mark, Need Transform and Preference Set-Up

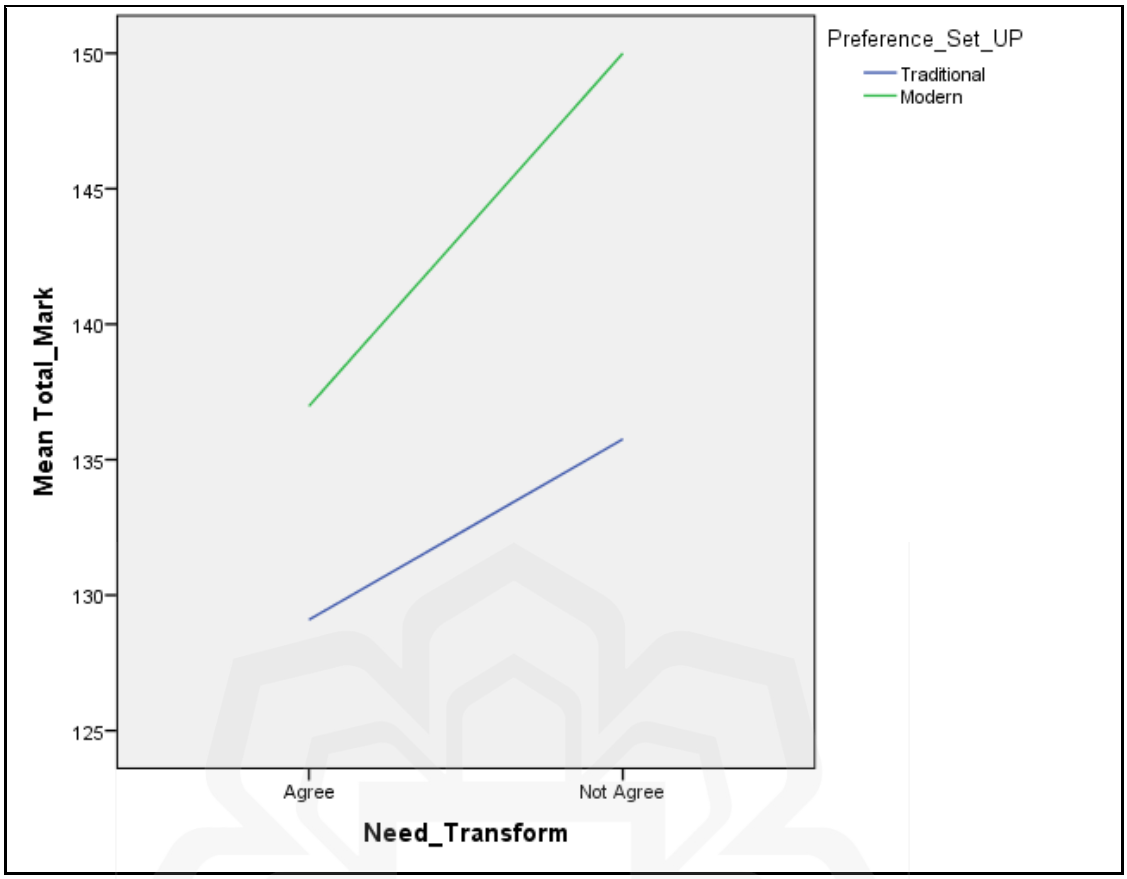
Tests of Between-Subjects Effects

Dependent Variable: Total_Mark

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	7249.704[a]	3	2416.568	3.080	.027	.024	9.241	.719
Intercept	4009838.522	1	4009838.522	5111.215	.000	.931	5111.215	1.000
Need_Transform	5105.189	1	5105.189	6.507	.011	.017	6.507	.721
Preference_Set_UP	6447.900	1	6447.900	8.219	.004	.021	8.219	.816
Need_Transform * Preference_Set_UP	532.074	1	532.074	.678	.411	.002	.678	.130
Error	298116.702	380	784.518					
Total	7474900.000	384						
Corrected Total	305366.406	383						

a. R Squared = .024 (Adjusted R Squared = .016)

b. Computed using alpha = .05



The output shows that there is not and without significant statistical interaction effect between the Preference need of transform * and user preference set up in the library. There is F(1,380)=0.678, as 0.411>0.05 (p=0.411).

4Q1.3(e) How do library users' preferences for noise alerting methods, library setup design, and learning abilities interact to influence reading comprehension scores?

Table 4.27 Descriptive Statistics: Total Mark, Preference Set Up and Preference on Noise Alerting

Descriptive Statistics				
Dependent Variable: Total_Mark				
Preference_Set_UP	Noise_Alert	Mean	Std. Deviation	N
Traditional	Noise Detector	132.06	26.970	102
	Human Alert	137.80	27.705	41
	Total	133.71	27.210	143

Modern	Noise Detector	141.89	29.728	159
	Human Alert	131.59	25.554	82
	Total	138.38	28.742	241
Total	Noise Detector	138.05	29.029	261
	Human Alert	133.66	26.342	123
	Total	136.64	28.237	384

Table 4.28 Levene's Test: Total Mark, Preference Set Up and Preference on Noise Alerting

Levene's Test of Equality of Error Variances[a]			
Dependent Variable: Total_Mark			
F	df1	df2	Sig.
1.439	3	380	.231
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.			
a. Design: Intercept + Preference_Set_UP + Noise_Alert + Preference_Set_UP * Noise_Alert			

Levene's test result shows that the homogeneity of variance assumption has not been violated. The output illustrates that the main effects for users preference set up and users' preference on noise alerting methods in the library are not significant (p>0.231), P=0.231. Therefore, neither user's preference set up nor the users' preference for noise alerting methods in the library significantly influences the learning ability in reading. In other words, users preference set up or users' preference for noise alerting methods in the library did not have a significant impact on learning ability in reading.

Table 4.29 Between-Subjects Effects: Total Mark, Preference Set Up and Preference on Noise Alerting

Tests of Between-Subjects Effects								
Dependent Variable: Total_Mark								
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]

Corrected Model	8668.455[a]	3	2889.485	3.701	.012	.028	11.102	.803
Intercept	5604057.080	1	5604057.080	7177.474	.000	.950	7177.474	1.000
Preference_Set_UP	247.177	1	247.177	.317	.574	.001	.317	.087
Noise_Alert	393.925	1	393.925	505	.478	.001	.505	.109
Preference_Set_UP * Noise_Alert	4888.544	1	4888.544	6.261	.013	.016	6.261	.704
Error	296697.951	380	780.784					
Total	7474900.000	384						
Corrected Total	305366.406	383						

a. R Squared = .028 (Adjusted R Squared = .021)

b. Computed using alpha = .05

The output shows that there is a significant interaction effect 0.013<0.05 ($p<0.05$) for Preference_Set_UP * Noise_Alert. That is, the influence of users'

preference of noise alerting methods on learning abilities does depend on the preference library setup, F(1,380)=6.261, P<0.013.

4Q1.3(f) How do library users' preferences for noise alerting methods, library transformation, and learning abilities interact to influence reading comprehension scores?

Table 4.30 Descriptive Statistics: Total Mark, Preference on Noise Alerting and Need of Transformation

Descriptive Statistics				
Dependent Variable: Total_Mark				
Noise_Alert	Need_Transform	Mean	Std. Deviation	N
Noise Detector	Agree	137.97	30.415	172
	Not Agree	138.20	26.309	89
	Total	138.05	29.029	261
Human Alert	Agree	131.03	24.591	87
	Not Agree	140.00	29.568	36
	Total	133.66	26.342	123
Total	Agree	135.64	28.731	259
	Not Agree	138.72	27.179	125
	Total	136.64	28.237	384

Table 4.31 Levene's Test of Equality: Total Mark, Preference on Noise Alerting and Need for Transformation

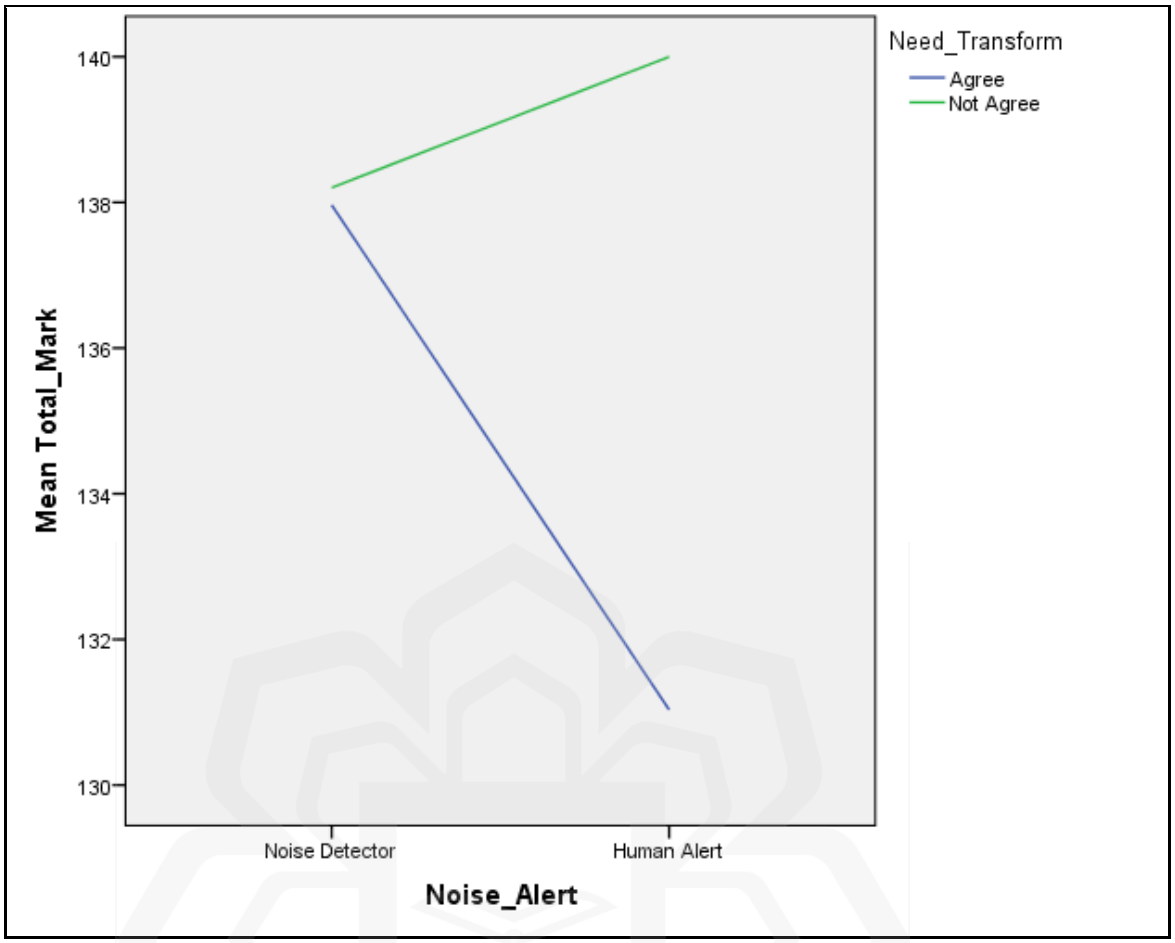
Levene's Test of Equality of Error Variances[a]			
Dependent Variable: Total_Mark			
F	df1	df2	Sig.
2.470	3	380	.062
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.			
a. Design: Intercept + Noise_Alert + Need_Transform + Noise_Alert * Need_Transform			

Levene's test result shows that the homogeneity of variance assumption has not been violated. The output illustrates that the main effects of users' preference for

transformation in library and users' preference for noise alerting methods in the library are not significant (p>0.062), P=0.062. Therefore, neither user's preference for transformation in the library nor users' preference for noise alerting methods in the library significantly influences the learning ability in reading. In other words, users' preference for transformation in the library or users' preference on noise alerting methods did not have a significant impact on learning ability in reading.

Table 4.32 Tests of Between-Subjects Effects: Total Mark, Preference on Noise Alerting and Need of Transformation

Tests of Between-Subjects Effects								
Dependent Variable: Total_Mark								
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	3659.359[a]	3	1219.786	1.536	.205	.012	4.609	.405
Intercept	5316398.277	1	5316398.277	6696.003	.000	.946	6696.003	1.000
Noise_Alert	467.783	1	467.783	.589	.443	.002	.589	.119
Need_Transform	1503.654	1	1503.654	1.894	.170	.005	1.894	.279
Noise_Alert * Need_Transform	1352.665	1	1352.665	1.704	.193	.004	1.704	.256
Error	301707.047	380	793.966					
Total	7474900.000	384						
Corrected Total	305366.406	383						
a. R Squared = .012 (Adjusted R Squared = .004)								
b. Computed using alpha = .05								



The output shows that there is not and without significant statistical interaction effect in between the Preference need of Noise_Alert * Need_Transform in the library. There is F(1,380)=1.704, as 0.193>0.05 (p=0.193).

4Q1.4 To what extent do patrons prefer collaborative activities in common areas and the use of noise alert systems for noise management in these spaces?

This research sub-question examines the following:-

4Q1.4(a) How does an automatic noise monitoring system affect patron preference for collaborative activities in academic libraries' common areas?

A significant proportion of respondents (55.7%) either strongly agreed or agreed that they would prefer to study with others in the library's common area if the library employed an automatic noise monitoring system that would alert users when noise levels exceeded a certain threshold (indicated by a color change to red). Conversely, a smaller proportion of respondents (24.5%) either strongly disagreed or disagreed with this proposition, indicating that they did not like the idea of using an

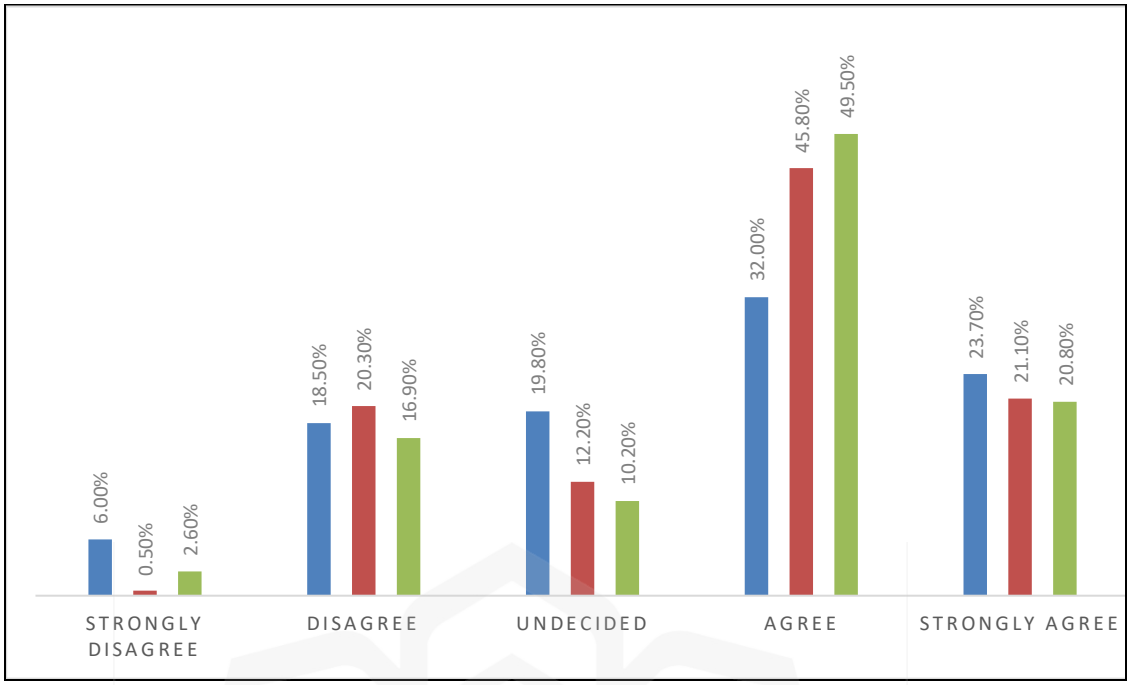
automatic noise monitoring system as an alerting tool to draw attention to noise concerns in the library's common area.

Furthermore, a majority of participants 21.1% strongly agreed and 45.8% agreed that collaborative work in library common areas is the best approach for the country's current learning trends if the library employed an automatic noise monitoring system that would alert users when noise levels exceeded a certain threshold. The system would trigger an alert by changing color to red when the noise level in the surrounding area becomes too high. In contrast, a small minority of participants (0.5% strongly disagreed and 20.3% disagreed) indicated that they believe this approach is not suitable for Malaysia's current learning trend.

According to the survey, the majority of respondents (70.3%) indicated that they would be more likely to study frequently in the library's common area if an automatic noise alert system were used to notify users of excessive noise levels. The system would change to red when noise levels in the surrounding area became too high, especially if group study was allowed. Conversely, a small percentage of respondents (19.5%) indicated that they would be unwilling to study in the library's common area, particularly if group study was permitted and a noise alert system was used to notify patrons of excessive noise levels.

Table 4.33 The Percentage of Automatic Noise Monitoring Systems That Make a Difference in Patrons' Willingness to Collaborate in Academic Libraries

Description	A1	A2	A3
Strongly Disagree	6.0%	0.5%	2.6%
Disagree	18.5%	20.3%	16.9%
Undecided	19.8%	12.2%	10.2%
Agree	32.0%	45.8%	49.5%
Strongly Agree	23.7%	21.1%	20.8%



4Q1.4(b) How does the use of an automatic noise monitoring system to signal when noise levels exceed a certain threshold affect patron preference for collaborative activities in academic libraries, as manifested in their behavior in collaborative common spaces?

According to the survey data collected, as presented in Table 4.37, the findings indicate that 16.1% of respondents strongly agreed and 40.9% agreed that they would first consider studying in the library and conducting collaborative activities in the library common area, provided that the library employs an automatic noise alert monitoring system to signal when noise levels in the surrounding area become too high. Only 2.6% and 18.5% of respondents strongly disagreed and disagreed, respectively, that they would first consider using the library to conduct collaborative activities in the common area. Additionally, 21.9% of respondents were undecided about contributing their opinion.

In addition, a substantial majority of respondents (76.5%) expressed their intention to use the library common areas regularly for both personal study and teamwork if the library implemented an automatic noise alert monitoring system to signal when noise levels in the surrounding area became too high. Conversely, only a small minority of respondents (1.6% strongly disagreed and 12.8% disagreed) indicated that they would not use the library common areas regularly for these

purposes. Approximately 9.1% of the respondents were undecided in providing their opinion.

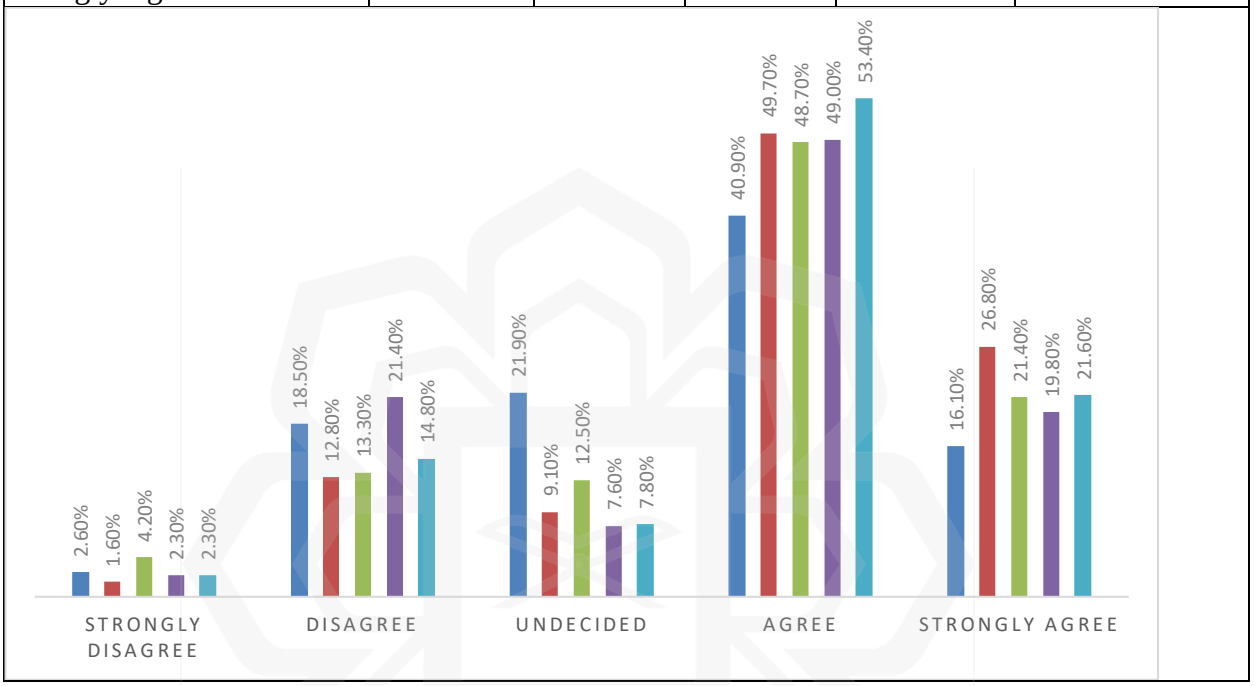
A substantial majority of respondents (70.1% overall, with 21.4% strongly agreeing and 48.7% agreeing) indicated that they would recommend the library's common areas to their friends for regular study and project collaboration, provided that the library employs an automatic noise alert monitoring system to signal when noise levels in the surrounding area become too high. In contrast, only a small percentage of respondents (4.2 % strongly disagreed and 13.3 % disagreed) indicated that they would be unwilling to recommend the library's common areas to their friends for regular study and project collaboration in a situation where the library employs an automatic noise alert monitoring system to signal when noise levels in the surrounding area become too high. Approximately 12.5% of the respondents were undecided in providing their opinion.

Additionally, a majority of respondents (68.8%) either strongly agreed or agreed that they would say positive things about the library common area as a great space for studying and working together with others, due to the allowance of discussion and the implementation of an automatic noise alert monitoring system. This system alerts users to noise concerns by changing color to red when the surrounding noise level becomes too high. In contrast, 23.7% of respondents either strongly disagreed or disagreed that the library common area is a favorable place to study and work with others due to the noise alert system. Finally, 7.6% of respondents remained undecided in sharing their opinion.

A preponderance of respondents 75%, (21.6% strongly agreed and 53.4% agreed) indicated that they would be more likely to persuade their friends to make full use of the library's common areas for study and collaborative work if the library implemented an automatic noise alert monitoring system to signal when noise levels in the surrounding area became too high. Conversely, only a small minority of respondents (2.3% strongly disagreed and 14.8% disagreed) indicated that they would not encourage their friends to use the library common areas for these purposes. Additionally, 7.8% of respondents were undecided.

Table 4.34 The Relationship Between Automatic Noise Monitoring Systems and Patron Behavior in Collaborative Common Spaces in Academic Libraries

Description	B1	B2	B3	B4	B5
Strongly Disagree	2.6%	1.6%	4.2%	2.3%	2.3%
Disagree	18.5%	12.8%	13.3%	21.4%	14.8%
Undecided	21.9%	9.1%	12.5%	7.6%	7.8%
Agree	40.9%	49.7%	48.7%	49.0%	53.4%
Strongly Agree	16.1%	26.8%	21.4%	19.8%	21.6%



4Q1.4(C) What is the academic patrons' preference for the use of noise monitoring systems as an alerting tool to maintain a productive learning environment in library common areas?

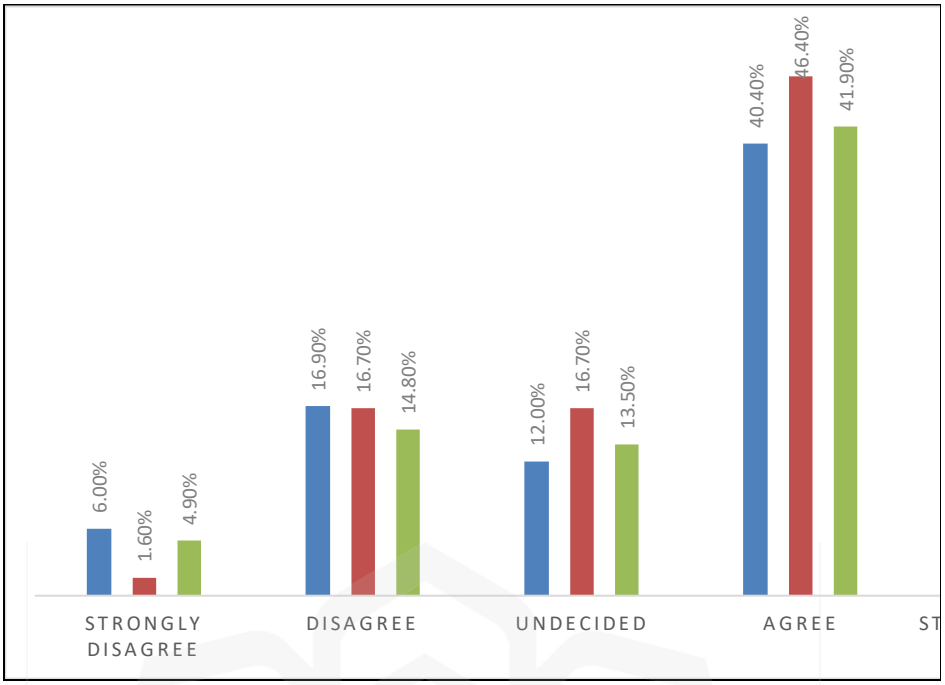
The results of a survey conducted in academic libraries in Malaysia indicate that a significant majority of respondents, 24.7% strongly agree and 40.4% agree to believe that an automatic noise alert monitoring system is necessary in library common areas where collaborative work activities are allowed. The system would serve as an alerting tool that indicates noise concerns to users by changing color to red when noise levels exceed the predetermined standard. In contrast, 6.0% and 16.9% of respondents strongly disagreed and disagreed, respectively, with the use of an automatic noise alert monitoring system in libraries where collaborative work activities are allowed. Additionally, 12.0% of respondents were undecided.

A majority of survey respondents (18.8% strongly agreed and 46.4% agreed) indicated that the implementation of a noise monitoring system in the library would alleviate their concern about disturbing others while studying or working alongside them. The automatic noise alert monitoring system in the library serves as a notification tool to draw attention to noise concerns for users. If the noise level in the surrounding area exceeds a certain threshold, indicated by a change in color to red, the system alerts users. Conversely, only 1.6% and 16.7% of respondents strongly disagreed and disagreed, respectively, that the noise monitoring system in the library would reduce their concern about disrupting others. Additionally, 16.7% of respondents remained undecided about expressing their opinion.

A substantial majority of survey participants (24.7% strongly agreed and 41.9% agreed) expressed the belief that a noise monitoring system could help alleviate noise problems and enhance library services. This favorable response was contingent on the library's use of an automatic noise alert monitoring system, which would notify users of noise concerns by changing the color to red if the noise level in the vicinity exceeded a certain threshold. Conversely, a small minority of respondents (4.9% strongly disagreed and 14.8% disagreed) indicated that they believed that a noise monitoring system would not improve library services or reduce noise problems if an automatic noise alert monitoring system was used. The remainder of the participants (13.5%) were undecided and did not express a definitive viewpoint.

Table 4.35 The Academic Patrons' Perspectives on the Use of Noise Monitoring Systems as an Alerting Tool to Maintain a Productive Learning Environment in Library Common Areas.

Description	C1	C2	C3
Strongly Disagree	6.0%	1.6%	4.9%
Disagree	16.9%	16.7%	14.8%
Undecided	12.0%	16.7%	13.5%
Agree	40.4%	46.4%	41.9%
Strongly Agree	24.7%	18.8%	24.7%



4.3.3 Research Question 3

Research question 3 : "What are the evidence-based challenges and implications of transforming learning spaces in academic libraries in Malaysia to meet the needs of users and library management in terms of learning activities, sociability, comfort, and noise levels, in line with the current learning trends in Malaysian education system?". It is to understand the challenges and consequences of redesigning library spaces in Malaysia to better meet the needs of users and library management. The quantitative data will be crucial for librarians to provide informed perspectives during Zoom interviews and contribute to a deeper understanding of the challenges and consequences of redesigning Malaysian libraries.

The quantitative data analysis determined the ideal decibel noise levels for study spaces in Malaysian academic libraries and identified the overall preferences of patrons for these spaces, both now and in the future. This analysis compared noise levels and preferences in existing physical library study spaces to the potential behavior and preferences of library users regarding the use of noise detection machines in future common areas.

The data that was collected has been used to create interview questions that can help to identify the benefits, implementation possibilities, shortcomings, potential issues, and areas for improvement in library management planning for the operation of libraries in Malaysia in the context of the education system's transformation to Education 4.0, to improve the overall performance of current academic librarians in Malaysia and maximize the use of learning space facilities.

The thematic analysis of interview transcripts has yielded holistic insights into the preference attributes of learning spaces for future librarians to direct their management. This can help librarians understand the underlying causes of patterns, problems, and current and future usage behavior trends related to learning spaces, which can support Education 4.0. These insights will be based on the qualitative summary data findings outlined below:-

- The quantitative data proven that the collected data from 384 samples of academic libraries in Malaysia to measure noise level acceptance in general areas found that a background noise level of less than <50 decibels (dB) is acceptable for users. This is because research has shown that noise levels below <50 dB do not have a significant impact on reading ability.
- Empirical research has shown that noise levels below 50 decibels (dB) are ideal for collaborative learning spaces in academic libraries. Noise levels above 50 dB can disrupt other users, interfere with the learning process, and make it more difficult to retain information and learn effectively. Noise levels below 50 dB are essential for creating a productive learning environment in libraries. This finding is particularly important in the context of Education 4.0, which prioritizes active learning and collaboration.
- Studies have also demonstrated that having a fixed level of noise fosters a culture of consideration and respect among library users, ultimately leading to higher user satisfaction with the library and their overall learning experience. This is particularly important in the context of Education 4.0.
- There is a need for the current academic library to transform its services. The majority of users prefer a modern setup for the library. The data

shows that the majority of users prefer a modern library setup with a focus on collaborative learning and social spaces. The survey also found that users believe that the library's learning area should shift from a serious and formal environment to a more relaxed and inviting space. Common areas in the library can be utilized to support a variety of collaborative and leisure activities that meet the needs of learners.

- There is a growing consensus that collaborative work in common areas of libraries is an optimal approach to learning in Malaysia. This is supported by data showing that libraries that allow group studying in common areas have higher rates of usage and that frequent users of these areas tend to speak positively about them, recommend them to others, and provide favorable feedback. These findings suggest that allowing group studying in common areas can help to create a more productive and collaborative learning environment for students.
- Empirical evidence suggests that noise monitoring devices can be a valuable tool for identifying and managing noise-related issues in libraries. By drawing users' attention to noise concerns, these devices can help to reduce noise levels and improve the overall quality of the library environment. Additionally, installing a noise alert system at each table can further improve library services by reducing users' concerns about disrupting others while studying or working.
- The study has yielded valuable understandings by presenting contact and background details, facilitating well-informed decisions regarding intervention, and offering guidance and assistance. The findings from the research have exposed how using social amenities collaboratively influences users' attitudes and opinions of the educational setting. Furthermore, the research has shown that the data collected can greatly enhance the effectiveness of academic libraries. With the help of this data, libraries can implement a comprehensive plan to tackle issues related to noise in the learning environment, which would result in a more conducive atmosphere for learners to study and gain knowledge.

4.3.4 Qualitative Research Data Analysis

The research has used quantitative methods to collect data on user preferences, noise levels, and their impact on the learning process. Based on this analysis, the research has transitioned to a qualitative phase, involving interviews with expert librarians. These interviews will help identify existing gaps and challenges in addressing them. The research aims to contribute to understanding management operations and their limitations in addressing these gaps, and to identify effective strategies for improving library physical learning space services in the context of Education 4.0 in Malaysian academic libraries.

The interviews focused on the need to modernize physical services in Malaysian academic libraries, particularly in light of the increasing popularity of collaborative and informal study spaces. The interviews also explored the challenges and best practices for implementing group study spaces in libraries. Additionally, the interviews discussed the use of noise monitoring devices in academic libraries, their effectiveness in controlling user noise levels, and the feasibility of establishing fixed noise level limits in library areas. The data collected in phase 2 has been analyzed and tabulated, providing valuable insights for future decision-making and policy implementation.

4.3.1.1 Librarians' Experience in Education 4.0

There is a mounting consensus among librarians that the Education 4.0 movement has profoundly influenced the function of libraries in Malaysia. In order to remain pertinent and successful, academic libraries in Malaysia must keep up with the most recent educational trends and criteria.

Librarians widely acknowledge and note that Education 4.0 is a pedagogical approach that emphasizes teamwork, cooperative learning, and social interaction. These learning methods are aligned with the educational pedagogy in Malaysia, and they have led to a paradigm shift in the way students learn. The alignment of new learning methods with the educational pedagogy in Malaysia has had a significant impact on library operations. Libraries are no longer passive repositories of

information; they are now active learning spaces where students can collaborate, learn, and create.

Academic libraries in Malaysia that fail to adapt to the changing educational pedagogy may become obsolete and only be able to cater to users who require a quiet and private space for personal use. A substantial number of librarians in Malaysia contend that academic libraries play a critical role in Education 4.0 by providing access to rich digital resources, offering creative learning spaces that support student collaboration, and strictly monitoring noise levels in silent zones.

In response to the interview question, "Do your current library services support Malaysia's education programs through learning spaces?", the respondents' answers centered around the themes of learning spaces and the Malaysian education system. The responses from Malaysian librarians suggest that many believe academic library study spaces are outdated and don't meet the needs of today's education system. such statement of “Regarding study spaces and Malaysia's education system, we haven't invested significantly in physical learning environments due to budgetary constraints”, "Since joining the library 15 years ago, there hasn't been a specific directive to modify or improve the study spaces.", “Our budget is tight, and most of our funds are currently used for digital resources instead of physical study spaces” , “Our existing furniture is still in good condition, so we haven't felt the need to invest in new equipment.” These has evident in the layout and operational procedures of these spaces, which are often outdated and inefficient. As a result, library users are not able to fully benefit from the learning opportunities that these spaces offer.

The varied education system prevalent in Malaysia has also shaped the behavior patterns of library users. For example, students who are accustomed to a more traditional learning environment may be uncomfortable with the more collaborative and interactive spaces that are becoming increasingly common in academic libraries. This can lead to a mismatch between the needs of library users and the resources that are available to them.

To address these challenges, academic libraries in Malaysia need to invest in the redesign and modernization of their learning spaces. They also need to develop new services and programs that are tailored to the needs of the diverse student

population. By doing so, libraries can play a more active role in supporting student learning and achievement.

Academic librarians in Malaysia are concerned about the deterioration of the learning space image due to a clash in library culture. This clash is caused by a number of factors, including limited financial resources, outdated building design layouts, resistance to change, and the use of outdated library metaphors.

Librarians have recognized that there is a tension in library culture between traditional library practices and the incorporation of informal learning spaces into libraries. Informal learning spaces can create a fresh service perception for users and support new learning features. By introducing modern learning spaces that serve a purpose and reflect a contemporary approach to library operations, traditional library practices can evolve to cater to Education 4.0.

Academic librarians in Malaysia have increasingly taken on the responsibility of managing libraries in a proactive and adaptable manner. This is evident in the quantitative findings of a recent study, which showed that students will be more satisfied with libraries that are managed in this way. In particular, students might appreciate the learning spaces, which they often find to be more inviting and conducive to study.

The proactive and adaptable approach to library management involves a number of key principles. First, librarians must be responsive to the needs of their users. This means understanding the changing needs of students and faculty and making adjustments to library services accordingly. Second, librarians must be creative and innovative in their thinking. They should not be afraid to experiment with new ideas and approaches, in order to provide the best possible service to their users. Third, librarians must be collaborative and work effectively with other departments such as administrators, faculty, and students. By working together, they can create libraries that are truly responsive to the needs of the university community.

The positive feedback from users suggests that the proactive and adaptable approach to library management might be a successful one. Students are more satisfied with libraries that are managed in this way, and they are more likely to use the library for their studies and learning purposes. This is good news for academic

librarians, as it suggests that they are on the right track in their efforts to provide high-quality library services.

It is noted that the incorporation of informal learning spaces into libraries is a significant shift in library culture. It requires librarians to be open to new ideas and to be willing to change the way they think about libraries. However, the benefits of informal learning spaces are clear. Librarians can make libraries more attractive to users, support new learning features, and help libraries evolve to meet the needs of the 21st-century learner.

Librarians have recognized a discrepancy between the needs of library users and what the library is currently offering. Librarians belief that academic libraries are essential to colleges and universities, as evidenced by the rigorous evaluation of library operations by the Malaysian Qualifications Agency (MQA). The MQA is a government agency that is responsible for ensuring the quality of education in Malaysia. As part of its evaluation process, the MQA assesses the quality of library services at colleges and universities. According to them the MQA's evaluation of library services is based on a number of factors, including the availability of resources, the quality of staff, and the level of user satisfaction to ensure that students have access to high-quality library services.

Many librarians have received positive feedback from MQA on their library services, collection, and facilities. However, despite this positive feedback during the accreditation process, users seem hesitant to utilize the facilities and services provided. The libraries in Malaysia offer excellent facilities and services, but they may not be fully utilized as learning spaces, which is a concern.

According to librarians, despite receiving positive feedback from the Malaysian Qualifications Agency (MQA) on their overall library services, collections, and facilities, librarians in Malaysia are concerned about the low utilization of library facilities and services by users. Librarians believe that this is due to users' unmet expectations of what libraries can offer. For example, Users understand that library staff members are responsible for carrying out their duties in an excellent manner in accordance with the library's policies and procedures. However, users may expect libraries to be more than just repositories of information or places where the smooth

operation of the library is ensured. They may feel inconvenienced or restricted by the library's policies. They may expect libraries to create more inviting and welcoming learning spaces where users can collaborate, learn, and create.

Librarians agreed that they need to better understand the needs of their users and to communicate more effectively about the services and resources that are available. They have suggested the integration of fresh metaphors to portray the library as a place of solace during difficult times, a hub for idea creation, and a hospitable atmosphere that promotes collaborative work and learning. These visual representations intend to inspire ongoing usage of the library's educational facilities, elevate user comfort, boost loyalty and contentment, and entice new patrons to avail themselves of the library's physical amenities.

4.3.1.2 Access and Linkages in The Library

Librarians point out that most academic libraries in Malaysia are centrally located on university campuses, with different zones, rich collections to support users' needs, and good internet connections. The central location of academic libraries is a key factor in encouraging students to use their resources, as it is more visible to students and can also encourage them to use the library. Librarians have also suggested that when constructing new libraries or renovating existing ones, it is important to create an all-in-one facility that incorporates non-traditional units, such as designated quiet zones with less noise and soundproof partitions, special care for noise control services for users, cafes and fast food outlets, along with areas for collaboration, meetings, and creativity, to serve users qualitatively. This is because these types of units can make the library more inviting and attractive to students, and they can also provide students with additional services and resources that they may need. By incorporating these factors into library space planning, librarians can create libraries that are more student-friendly and that can better support student learning and success.

Librarians have identified a number of preferred characteristics for student-friendly library learning spaces for younger generations. These characteristics such as relaxation, friendliness, collaboration, active learning, operational policies, sound, and the preferences of digital natives. They concur that many library users prefer to

conduct group discussions and revisions in the library's common areas when discussion rooms are occupied.

Librarians have long recognized the impact of library zone design and arrangement on user behavior. The design of library zones can influence how users move through the library, how they interact with the resources, and how they feel about the library as a whole. Librarians noted that the relationship between zone design and user behavior is complex and multifaceted. It is influenced by a variety of factors, including the types of users, the activities they are engaged in, and the overall purpose of the library. However, some general principles can be identified as the overall design theme of the zone environment can also have a significant impact on user behavior. The librarians belief that the natural environment or a historical setting, can create a more immersive and engaging experience for users.

Librarians recognize the significance of contemporary and up-to-date facilities to keep pace with the latest developments in the education sector. The culture of zoning plays a vital part in influencing the learning atmosphere, and librarians have indicated that having more diverse zones in academic libraries in Malaysia is crucial to support the learning process of various users.

Librarians believe that by carefully considering the design and arrangement of library zones, they can create spaces that are conducive to learning, collaboration, and creativity. This is important because users need different spaces for different activities. For example, users need quiet spaces for focused research, collaborative spaces for group work, and social spaces for relaxation and collaboration.

By carefully considering the needs of their users, librarians can create library zones that meet the needs of everyone. This can help to ensure that users are able to conduct their research, studying, and socializing activities seamlessly throughout the day in the library.

4.3.1.3 The Evolution of Libraries: Uses and Activities

READING AND WRITING

Quantitative data suggests that there is no statistically significant difference in learning outcomes between library users who prefer a modern or traditional library setup. This finding is consistent with the views of librarians who have conducted qualitative research exploring the experiences of library users. In other words, the type of library setup does not have a substantial impact on student learning outcomes. Regardless of the library setup, whether it is modern or traditional, users can study without compromising their learning outcomes.

Librarians agree that the original purpose of libraries is for learning and that the layout and design of libraries are still largely focused on this purpose. They believe that the most important factor for learning is the availability of resources and the quality of the library's services. Therefore, they believe that users will still be able to learn effectively in both modern and traditional libraries, as long as they have access to the resources they need. During the interviews, participants were asked to describe their ideal library, the collected respond “I desire for a quiet library with a modern learning environment”, “hoped that library users would be mindful of their behavior and maintain a quiet study environment”, “preference for libraries that balance traditional practices with modern approaches”,

Most librarians agree that reading is a form of serious and introspective self-regulated learning. They also believe that the sound of reading does not create any difficulties in their daily work. Individuals who engage in reading activities typically opt for secluded locations, such as carrel tables or private corners. However, librarians have different views on readers who prefer public spaces. Some librarians believe that these readers should wear headphones to minimize the effects of external disturbances such as people's movements and background noise. Others believe that readers should be allowed to choose whatever location they prefer, regardless of whether or not they wear headphones.

Most librarians agree that laptops' prevalence has led to a decline in pen and paper writing in libraries. They have also noted a correlation between solitary writing

and group discussions, with both activities fluctuating seasonally. During peak periods, such as the middle of the semester or assignment periods, users are more likely to engage in group writing, whereas revisions are done together with minimal interaction. Students who prefer to write alone in the library often seek out quiet study areas and wear headphones to concentrate.

COLLABORATING

The quantitative study revealed that libraries should become more social spaces for learning rather than formal learning environments. As a result of this finding, several librarians recognized the necessity of creating collaborative learning spaces in libraries, particularly in response to the ongoing transformation of the education system in Malaysia.

The preference of users for informal learning spaces and the need for more collaborative learning spaces has been well-established in previous quantitative data analyses. In other words, there is a significant amount of data that suggests that users prefer informal learning spaces and that there is a need for more collaborative learning spaces in libraries. Librarians have noted that users often prefer to engage in collaborative activities that require teamwork to accomplish a task or project. This type of active learning can boost users' motivation and achievement, making it an essential component of the education process.

When asked how libraries can help people, interviewees highlighted the importance of libraries adapting their services to align with Malaysia's evolving education system. Interviewees noted that there is not enough space to accommodate collaborative activities, " it is lack of meeting rooms which has often causes noise problems in other parts of the library", "while the discussion rooms are full, users often have to work in the common areas. The discussion rooms are always busy, while the common areas are not used as frequently".

Regarding future library preparations to meet the increasing demand for collaborative spaces, one respondent noted that the lack of such spaces has contributed to a decline in library usage. They also mentioned that the library administration is investigating ways to improve the learning environment and attract more visitors, "There has been observed a decline in library usage over the past 10 years", "the

library management is questioning why fewer users are utilizing the academic library", "libraries should reevaluate their daily operations and consider implementing active learning spaces, although managing these spaces can be difficult". According to some librarians, this social interaction is especially pertinent to present-day library operations. The pedagogical system in Malaysia has undergone changes that have impacted the way users interact with libraries. As a result, library users require more space to engage in interactive learning activities, and a learning environment that prioritizes human interaction.

Many librarians agreed that some academic libraries in Malaysia have not significantly evolved from their traditional setup, which is not conducive to collaborative learning and not meet the needs of the modern learner. This is evident in the spatial design of these libraries, which is often characterized by rows of individual desks and cubicles that discourage interaction and collaboration. Additionally, the operational methods of these libraries have remained unchanged from decades ago, when communal spaces were not designed to promote collaboration.

Librarians noted that learners are increasingly collaborative and they need spaces where they can interact with each other and share ideas. However, the traditional setup of academic libraries does not provide these types of spaces. The librarians who have noted this issue have called for a change in the spatial design and operational methods of academic libraries in Malaysia. The area of change includes creating more communal spaces where students can work together, as well as changing the policies and procedures of the library to encourage collaboration.

Some librarians believe that communal spaces in libraries will soon become more conducive to active learning. They argue that these spaces can be used for social interaction, collaborative work, and presentation practice, which are all important aspects of active learning. Additionally, they believe that communal spaces can be more appealing to younger learners, who are accustomed to working and learning in collaborative environments.

Communal spaces are often more appealing to younger learners than discussion rooms, which are often fully occupied. As a result, library users often use communal spaces for collaborative study and group discussions as a second choice.

The traditional perception of libraries as quiet spaces has led to confusion and difficulties for users who want to participate in learning activities in communal spaces. This is because communal spaces are often not designed for this purpose, as they may be too noisy or crowded. Additionally, the cultural perception that communal spaces should be quiet can create confusion and conflict among users who want to collaborate. To address these challenges, libraries need to change their policies and procedures to encourage collaboration in communal spaces.

To address these challenges, libraries need to change their policies and procedures to encourage collaboration in communal spaces. This could involve providing dedicated spaces for collaboration, such as creating policies that allow for more noise and activity in communal spaces. Libraries can also work to educate users about the benefits of collaboration and how to collaborate effectively in communal spaces. By making these changes, libraries can create more welcoming and inclusive spaces for learning and collaboration. This will benefit all users, regardless of their preferred learning style or cultural background.

While the traditional library is often seen as a quiet and silent space, this learning environment may be a more appropriate strategy for library administrators to adopt as they transition towards more collaborative learning opportunities. The traditional library model has been the norm for many years, but it is becoming increasingly outdated. As students become more collaborative in their learning, libraries need to adapt to meet their needs. This may mean creating more spaces for group work, relaxing the noise policies, and providing more resources that support collaborative learning. Librarians play a more active role in supporting collaborative learning and helping students to succeed.

COLLABORATING IN COMMON AREA AND NOISE ALERT

The results of a quantitative study revealed that most participants preferred using an automatic noise alert monitoring system in shared areas to draw attention to noise issues for individual users at each table. This system would indicate an alert by changing its color to red when the noise level in the surrounding area exceeded a certain threshold. Based on this finding, some librarians agreed that it was necessary to set a clear limit on noise levels in order to maintain the library's function as a space

that promotes a suitable learning environment. However, the librarians also noted that addressing the library's noise policy was not a popular or widely discussed concern among management. Some librarians point out that to ensure the users are able to enjoy a comfortable learning environment, noise policy can have a significant impact on the learning environment. Librarians should work with management to develop a noise policy and that is clear and enforceable. The installation of an automatic noise alert monitoring system could be a valuable tool for managing noise levels in libraries. Users will be more mindful of their noise levels as this system able to help draw attention to noise issues and encourage users to be more mindful of their noise levels.

Librarians have noted that noise-related problems are a common occurrence in the common areas of libraries. This raises questions about the ability of library staff to effectively monitor the learning environment. One of the challenges faced by library management is that staff often do not take a proactive approach to monitoring noise levels in common areas. Most of them agreed that library staff need to be more proactive in monitoring noise levels in common areas. To address this issue, librarians suggest the need to identify and educate library users on the acceptable types of collaborative activities and noise levels that should be maintained in the library. However, they also state that signage and notices about noise levels are ineffective, as people are unlikely to pay attention to them.

Librarians have observed that the majority of users who engage in collaborative activities prefer using common areas. This preference is influenced by a number of factors, including the layout of furniture, the public setting, ease of accessibility, a conducive environment, and the emergence of spontaneous behavior among users. However, monitoring the behavior of users in these areas has become a matter of concern for librarians, as it is important to ensure that the library is a quiet and respectful space for everyone. Some librarians discourage or prohibit users from engaging in noisy activities in common areas, while others may not. This inconsistent approach has led to confusion among users regarding the appropriate use of library space.

A minority of librarians believe that collaborative activities should only be carried out in designated noise-friendly areas, such as discussion rooms. However, recent feedback and data from both quantitative and qualitative sources have

demonstrated that common areas in the library can also be suitable as collaborative and noise-friendly learning spaces, as long as effective noise control measures are put in place. This inconsistent approach to the use of library space has led to confusion among librarians and users alike.

FURNITURE

Quantitative data indicates that library users prefer learning spaces with a modern and social theme. Qualitative data from librarians suggests that a significant portion of the library's furniture has been in use for many years and remains in good condition. This is because the library has always focused on purchasing high-quality furniture that meets the overall needs of the library and adheres to cultural practices. The high quality of library furniture has enabled some librarians to report that their furniture has been in use for over 20 years and is still in very good condition. The furniture is likely to last even longer, as the controlled environment and regular maintenance have helped to preserve its condition.

Some librarians argue that the rise in the use of digital resources in e-learning has prompted a re-evaluation of the design of the learning zone, as well as the arrangement of spaces and furniture. It is widely believed that academic libraries will have surplus space in the future, as obsolete materials are replaced by e-resources. With users increasingly preferring digital formats for reading materials, librarians expect that physical shelving space will become progressively empty over time, as outdated books are unsuitable for academic learning and cannot provide users with accurate information for reference purposes. As a result, this anticipated development is likely to have a direct impact on the future arrangement of library furniture.

Some library management have received feedback and are now devising strategies to implement changes. One such strategy involves removing unused bookracks and transforming that space into a communal area. They also intend to convert certain learning spaces into areas that inspire and boost productivity. To cater to the varied needs of contemporary users, the management plans to purchase modern furniture. However, due to budget constraints, these plans will be executed in phases over the course of a year. The librarians acknowledge that it is challenging for them to arrange the current furniture in a way that is both functional and aesthetically pleasing.

Nonetheless, they strongly believe that a modern-looking library can provide a creative learning space for users and is crucial for the library's future development.

According to most librarians, the chairs and tables presently available in the library are in excellent condition. Consequently, the management has decided against replacing or altering the furniture. The librarians have remarked that the library's budget is limited, and the majority of them believe that there is no need to change the furniture as it is still in good shape due to budgetary constraints.

A few librarians have stated that they are unwilling to modify the physical arrangement or layout of the furniture in the library due to budgetary constraints. They believe that library funding should prioritize the acquisition of the latest and high-quality reading materials, as well as the purchase of additional learning tools and media equipment, rather than replacing the existing furniture which is still functional. They argue that there is sufficient seating available to meet the needs of library users. These librarians also suggest that there are multiple reasons for maintaining the current state of the library. For instance, traditional library customs like maintaining a quiet environment are no longer applicable, and the library continues to support learning, promote literacy, and provide a venue for fostering healthy communities through education.

The aim of creating an effective learning environment is to offer suitable furniture that caters to the users' requirements. This includes cozy seating and spacious tables that are widely available in the current seating arrangements of the library's communal area. Typically, the current seating layout comprises a single large table with a limited number of closely positioned chairs, which has encouraged group collaboration. This arrangement has demonstrated the potential of the communal area to facilitate collaborative learning, although the implementation of a noise monitoring policy would be beneficial.

EQUIPMENT AND TOOL

According to the qualitative data collected, it was discovered that users have a stronger preference for incorporating media-based learning tools into social and modern-themed learning spaces. Librarians acknowledged a correlation between the use of media learning tools, learning space themes, and the transformation of the

library. As a result, they agreed that the library must adapt to users' growing demands by integrating intelligent e-learning tools and digital learning technologies into the evolving library environment.

Librarians emphasize that users have varying requirements when engaging in activities such as writing papers, completing assignments, or having discussions within the library's learning spaces. This necessitates the provision of a range of spaces, furniture, tools, and media equipment. Even though a significant number of users bring their own computing devices, they still require amenities like comfortable seating, large tables, photocopiers, whiteboards, office supplies, and access to computers, scanners, and printers.

The librarians are stressing the need to transform the library's current learning area into a learning commons that prioritizes media technology tools instead of traditional bookshelves. This shift poses a challenge for most librarians as they strive to create an inspiring and productive environment. According to the librarians, providing users with the latest digital equipment in the library may not be essential, but it is an excellent way to enhance the quality of services available to users and meet their learning needs. To remain relevant in the digital era, librarians emphasize the importance of adapting library services. The replacement of traditional whiteboards in the library with more advanced technology such as smart whiteboards, electronic whiteboards, smartboards, and interactive smartboards could have a positive impact on the library.

In the future, libraries will require digital tools and equipment to enable easily accessible online portals as an integral part of their services. To facilitate a blended learning environment, the physical learning spaces in libraries will need to be redesigned. This will involve the integration of E-Learning tools. Moreover, librarians aim to incorporate advanced technology such as 3D IT materials and robotics to provide interactive and exciting learning experiences for users, making learning enjoyable for all.

According to most librarians, their ultimate luxury is a contemporary and futuristic design that incorporates collaborative features, modern learning equipment, and up-to-date tools. To achieve this, they suggest including virtual learning tools and

other fun and dynamic elements that promote collaborative activities for presentations and discussions in the library. Some librarians even propose adding coffee and snack machines to create a cafe-like environment. Overall, the goal is to create a diverse and accommodating digital technology learning tool that caters to the diverse needs of library users in a common area.

Most librarians emphasize the significance of incorporating contemporary and forward-looking aesthetics in library design. Additionally, librarians also highlighted the value of employing artificial intelligence (AI) technology to supervise noise levels within the library. With the use of noise-detecting equipment and measurement of decibel levels, both librarians and library patrons can identify and address noise-related problems, resulting in a more productive and encouraging atmosphere for collaborative learning activities within the library.

FLEXIBILITY

A quantitative analysis of the data revealed that respondents preferred modern library setups. Librarians' feedback suggested that modern libraries are characterized by up-to-date facilities, flexible spaces, and a welcoming atmosphere, all of which contribute to the library's ability to facilitate community engagement and shared experiences.

Librarians provide their users with the flexibility to conduct their daily learning activities in a variety of ways, within the constraints of the library's policies and procedures. Librarians perceive flexibility as enabling collaborative activities, allowing them to speak freely and share ideas, and permitting them to communicate with team members within the library's policies and procedures. The focus of common learning spaces in libraries has shifted from simply providing a quiet space for concentration to creating an environment that promotes learning satisfaction and quality. This freedom and flexibility have led library users to become more self-aware of their changing attitudes and behaviors toward library use. Some librarians have suggested that common learning spaces should adopt the operating concepts of fast food chains, such as McDonald's and KFC, which allow for flexible collaborative activities within the constraints of the library's policies and procedures.

Librarians describe the physical space of a library as "fashionable" and "informal" when it is adaptable and flexible within the constraints of the library's

policies and procedures. This type of space promotes a lively learning environment that facilitates free-flowing communication, collaborative learning, dynamic and participatory activities, and informal learning approaches. Additionally, it is beneficial if the space has state-of-the-art technology and hosts social gatherings to foster user participation in a safe and welcoming environment.

According to librarians, the level of flexibility in a library is closely linked to the preferences and behavior of its users. They highlight that certain users may not be comfortable with discussion activities that are permitted in the library, and this is a cross-cultural practice. This conflicting situation has resulted in confusion and flawed decision-making for users during their learning activities in the library.

Librarians mostly favor a flexible approach to collaborative activities. They stated that if their ability to coordinate and discuss is limited within the library, it would discourage them from using the physical services. Librarians have noted that the prevailing trend in learning emphasizes kinesthetic learning, which involves learning through experience, observation, activities, and experimentation. This approach is considered effective in the learning process, and it is closely linked to the flexibility of conducting collaborative learning activities in library spaces.

According to librarians, Malaysia is heading towards the fourth industrial revolution and fourth education revolution, which focuses on visual, auditory, reading/writing, and kinesthetic (VARK) learning styles. To cater to the VARK approach, libraries need to create learning environments that support flexible collaborative activities, discussions, presentations, and board games. Such spaces are essential for learning and should be established in more areas of the library.

According to librarians, there has been a noticeable shift in the learning trends and expectations of library users. The younger users, in particular, are viewed as more unruly compared to five years ago. The librarians attribute this perception of unruliness to the limited flexibility and the restrictions on active activities that are enforced in most libraries. As a result, users find it difficult to keep up with the current active learning trends.

According to librarians, the perceived flexibility in libraries has resulted in challenges for both librarians and users. The perception that restrictions on flexibility

in libraries are problematic has led to limitations on active activities in most libraries. This, in turn, has failed to keep pace with current active learning trends, and younger users may be more likely to engage in disruptive behavior while using library services.

The library's failure to adapt to current active learning trends has led to increased noise levels in all areas, regardless of designated quiet zones. To address this issue, librarians are considering implementing a flexible and consistently enforced noise policy for all users. This policy is intended to control and prevent noise-related problems in the library

4.3.1.4 Sociability

SOCIAL AND COMMUNAL

Based on quantitative research, the majority of participants concur that the learning atmosphere in libraries ought to shift from a formal and austere environment to a more convivial setting for learning, with a preference for a contemporary library setup. Librarians expressed disappointment that their differing perspectives with library users have been overlooked as a major contributing factor to this issue. They recognize that establishing a common understanding between librarians and library users is pivotal in implementing effective solutions to issues.

Librarians report that daily operations at the library are often fraught with conflicts arising from the diverse perspectives and behaviors of its users. The variations in the layout of library spaces are noticeable, and many librarians and their management struggle to adapt to the constantly changing environment.

The library is typically associated by librarians with a set of traits including peacefulness, quietness, formality, gravity, and being an excellent venue for learning. The ambiance is conducive to review and provides a perfect environment for developing habits of self-directed learning, offering privacy and a quiet space for study. With minimal disturbances, it is ideal for solitary reading and writing, and conversation is only allowed in designated discussion areas. It is expected that all library users will maintain silence while in the library.

Many librarians have observed a decline in the number of visitors and an inadequate use of specific areas and zones in the library. Some librarians link these challenges to factors such as insufficient consideration of user requirements, limitations on activities, shifts in user conduct, insufficient shared spaces, a strict policy of silence, a formal and austere learning environment in many library zones, and cultural clashes within the physical space. As a result, these problems have resulted in disagreements between library users and the present values and procedures of the library.

The librarians reached an agreement that the differences in library policies might impede users from fully benefiting from the learning spaces and services offered, resulting in low visitor numbers. A few librarians thought that noise regulations in the library had caused misunderstandings among users about permissible activities. They also acknowledged the necessity of staff members maintaining a conducive learning environment, yet acknowledged that it could make users feel confined.

The librarians agreed that the library's activities and learning environment are in close accordance with the needs and expectations of the users. They also noted that the users tend to study individually at home and prefer the library for collaborative activities with their peers. The convenience of comfortable learning spaces with air conditioning in homes and hostels, fast wifi, and easy access to e-reading materials is causing users to choose e-reading over traditional library spaces.

The pandemic has not only accelerated the adoption of digital technologies by academic institutions, but it has also caused a significant shift in users' preferences towards e-resources as their primary reference source in most libraries. Instead of physically visiting libraries, most users now rely on e-readers and other digital tools to access resources. The availability of e-resources has eliminated the need for physical visits.

Many librarians believe that libraries are not utilizing their physical spaces to their full potential, which is a common issue across different types of libraries and may worsen after the pandemic. The majority of library users are digital natives who

prefer using technology to multitask, and this trend has resulted in a decrease in the use of physical learning spaces in libraries, as noted by librarians.

The declining usage of physical learning spaces is a cause for concern among librarians. They recognize that if the majority of library learning spaces continue to remain formal and serious, there is a danger to the provision of physical space services. To address this issue, librarians are exploring ways to entice users back to the library by creating a personalized and effective learning environment that takes into account users' needs and preferences. This approach aligns with the principles of Education 4.0.

QUIET

Many librarians assert that the library's primary function as a place for learning should be upheld, and should not be forgotten and they contend that a noise-free environment is essential for creating a suitable learning environment. Librarians agree that a comfortable ambiance can be established in the library by advocating for quiet practices, which they are proud to uphold.

Most librarians have emphasized the significance of preserving the culture of silence within academic libraries. They view the library as the last bastion of disciplined learning in higher education and stress the need for an appropriate noise level. Their ideal noise level is comparable to that of a quiet bedroom, with quiet zones allowing for noise levels measuring less than 40 decibels. However, they acknowledge that the conventional notion of silence in academic libraries may not align with the requirements of modern users. As a solution, they propose the implementation of distinct noise levels for various areas within the library. The discussion zone and common areas are suitable for regular conversations, while quiet zones should remain moderately quiet.

Librarians have observed that library users have a shared understanding of the importance of silence in the library. This understanding is reflected in the generally low noise levels in libraries, which are often comparable to whispers. The practice of speaking in whispers is a useful and flexible noise standard that can be adhered to by both library staff and patrons, ensuring a peaceful environment in the library. This practice has become common, and librarians believe that the ideal noise level for

libraries is somewhere between the silence of a bedroom, the quietness of an office, and the sound level of a typical conversation.

Individuals who prefer to study in solitude are known to select noiseless environments, such as silent rooms or areas, to facilitate concentration, according to librarians. Nevertheless, users recognize the need for libraries to adapt to the modern trend of collaborative learning by permitting some amount of noise. This entails a shift from the conventional idea of absolute silence in libraries and embracing a regular conversational noise level to meet the learning requirements of library users.

NOISY

The quantitative data gathered indicates that respondents prefer to use automatic noise detector machines as a means of addressing noise-related concerns, rather than seeking the assistance of library staff. The respondents perceive the noise monitoring devices as a valuable tool for identifying noise-related issues in the library, as they can help to reduce users' distractions caused by noise. The majority of librarians also agreed that accepting noise as a legitimate concern could help alleviate noise-related challenges. However, some librarians suggested that new metaphors should be used to associate noise with legitimacy and media technology, in order to enhance the library's image.

The present library has a deficiency regarding noise and visual disturbance. Based on feedback received from librarians, the common area's open setup lacks soundproof amenities and is visually distracting, which renders it unsuitable for focused learning but conducive to collaborative activities. Several librarians have claimed that they are not worried about the social problems caused by the noise created by library users. They have observed that students who frequent the library usually wear headphones while working on their assignments. The participants have linked the realistic learning environment of users to the silent atmosphere in academic libraries. Additionally, the respondents have suggested that the quiet practices in common areas of the library may be a contributing factor to the decrease in the number of visitors to the library.

NOISE AND COMMON AREA

A majority of librarians agree that the layout of common areas in libraries typically does not include the use of permanent walls, partitions, or floor dividers. These areas were originally designed as open spaces without noise barriers. When questioned about their thoughts on quiet zones, most librarians stated that a truly silent learning environment would require a soundproof system to minimize both noise and visual distractions. As such, the common area is not appropriate for silent learning but rather for social activities.

Librarians commonly associate social activities in the common area with problems related to noise barriers. The issue of noise is closely tied to library services, and many librarians argue that addressing noise concerns is a fundamental aspect of library space services in common areas. Consequently, it is suggested that clear guidelines on acceptable noise levels should be established for library common areas.

When considering the perspective of librarians regarding the changes in the common area, many emphasize the implementation of contemporary approaches to facilitate collaborative learning and foster peer discussions, as the common area is an open floor area without dividers. Librarians provide detailed explanations of the sbuilt-out of common areas, which were suitable to support collaborative and interactive activities. They suggest that these spaces should always reflect the preferences and practical needs of the majority of users, as they encompass a large area within the library.

When discussing noise problems in common areas, librarians often connect it to changes in the learning environment and user behavior. Many have noticed that an increasing number of students prefer to do their homework at fast food establishments such as cafes, KFC, and McDonald's. This shift highlights the need for librarians to evaluate the benefits and preferences of their users when it comes to learning spaces. Some librarians have suggested that the features of fast food establishments, such as flexibility, the ability to eat, relaxation, informality, and the absence of strict silence policies, could be adapted to libraries. Therefore, it may not be appropriate to enforce strict silence policies in common areas in light of current trends.

A new approach to managing noise-related issues in libraries should be developed, incorporating features that promote a more conducive learning environment. This approach should focus on both the management of the library space and the behavior of library users. Defining more specific noise levels allowed in different areas of the library can help to maintain the library's primary culture, which is related to creating a comfortable, welcoming, and recognizable physical space. Librarians agree that libraries should not operate like cafes, fast food restaurants, or campus canteens, and instead, noise level policies can help to retain the unique and important role that libraries play in society.

However, the issue of noise in libraries is often subjective and difficult to control, with factors such as attitudes, learning styles, and the need for discussion playing a role. Librarians acknowledge that this perception of noise as disruptive is biased and that students are often just collaborating with classmates on academic assignments. They believe that noise policies should be designed with the improvement of learning in mind. However, there is a need for a clear definition of noise levels in the library, as conflicting interpretations have caused confusion and poor decision-making for users. In some cases, cultural clashes have arisen over noise practices in libraries. Wearing headphones may be a solution for those who are sensitive to noise.

The primary cultural practice in library learning space, as viewed by librarians, is the policy of silence. This practice is seen as a hidden value that directly influences the behavior of library users. However, the current issues related to noise have caused negative consequences for both the library management and the users who engage in discussion activities in the library. To address this, librarians believe that it is important to establish standards for noise levels in different areas of the library.

EDUCATION 4.0, COMMON AREA AND SOCIABILITY

After collecting quantitative data, it was discovered that an automatic noise monitoring system can effectively address noise-related issues in libraries. Some librarians argue that a library's noise policy is closely linked to its reputation for being a quiet place. Others believe that the need for a noise policy is tied to the education system in Malaysia. They explain that libraries are essential for providing education,

and the current education system in Malaysia has influenced how users behave in libraries. Many librarians acknowledge that collaborative learning activities, such as group study sessions and brainstorming, are becoming increasingly popular among library users. They also assert that libraries play an integral role in supporting the transformation of Malaysia's pedagogical delivery system, which is closely linked to users' behavior and the education system. Therefore, the library and education system are inseparable, and libraries are directly involved in supporting pedagogical transformations in Malaysia.

The transformation in the Education delivery system in Malaysia has had an impact on the users' behavior in libraries. The transformation from teacher-centred to current learners as connectors, creators, and constructivists has given birth to a new emerging learning ecosystem for Malaysians. Librarians agree that an active learning experience for students is essential, the current lecturers are moving to flexible and adaptive teaching methods, the teaching methods as according to Malaysia Higher Education 4.0 (MyHE4.0). They are connecting education with automation technology which focuses on life skills and centric learning methods.

Librarians agreed that the importance of current students generating their knowledge through personal experiences has become the new learning trend in education. Library space is a good physical space to foster and support students' learning experience for students during their learning process. Librarians claim that silent practices prohibit learning.

In order to train students to diversify their roles in their learning process, active learning facilities and spaces are a must in the library. The respondent points out that silent and formal learning in the library is more suitable for teacher-centred classes which is no longer suitable for the current teaching system. The respondent added that the silent policy in libraries might be one of the problems of drop in gate count for their library. The respondent proposed to convert the common area to support collaborative learning activities due to the limitation of discussion rooms available in certain academic libraries.

Librarians point out that the current users' self-consciousness in bringing distribution to others is getting less. More and more users in libraries are lacking the

discomfort of disruption to other users. The librarians noted the importance of providing a flexible learning environment to users. Instead, some of the librarians feel uncomfortable asking users to keep quiet in the library as the users discuss their academic-related topics. Previously, users would feel shame for disrupting other users while they conduct discussions in the library. However, the librarians point out that the transformation of the education system in Malaysia has changed the need for skills in education. Some librarians realized that users who conduct collaborative learning in libraries do not feel guilty or ashamed. Instead, certain librarians point out that users may feel making noise in the library is a gratifying and reasonable action as they feel that good communication and discussion skills are part of their strength in their learning process, instead it is part of their soft skills requirement in academic achievement.

The majority of librarians agree that the daily operational procedures and the overall culture that permeates the learning environment within libraries should be adjusted to align with the teaching approaches employed by lecturers. Additionally, it has been observed that effective communication and presentation abilities are valuable skills that will be increasingly important for Malaysians in the upcoming job market. The COVID-19 pandemic has demonstrated that online video and presentation tools are becoming the preferred method of communication in society. As a result, providing a designated space to support presentations and communication within libraries will soon become an essential facility. However, this shift in learning facilities will require careful consideration of how to manage noise-related issues.

The library acknowledges that the common area in the library is a shared space and, therefore, it is crucial to have specific rules and regulations for its patrons. It has been recognized that having unwritten guidelines in the library can lead to confusion, misinterpretations, and confrontations. The idea of silence in libraries is an unspoken code that is not officially outlined but rather a symbolic representation of the library. This cultural practice is well-known and accepted among users, indicated by signs, and closely monitored by library staff as a part of their daily responsibilities.

The input provided by librarians regarding the present trend of library usage indicates that users nowadays prefer collaborative studying, and group discussions,

and occupy meeting rooms rather frequently. However, common areas in the library are found to be underutilized.

Librarians point out that the possibility of the underutilization of library common area is influenced by factors such as the convenience of accessing e-resources, the culture of serious studying within the library, restrictions on collaborative activities, and the availability of personal technology tools for learning, which makes studying at home or in a hostel equally convenient. To maximize the utilization of these areas, librarians recognize the importance of reviewing users' current needs and expectations.

The feedback from librarians regarding the disruptive behavior of library users has led to a renewed focus on "educating" users about appropriate conduct in the library. Not providing the most recent library image update could result in it becoming obsolete. The current common areas library operational concept is associated with comfort, providing a sense of ease, uplifting spirits in times of distress, and a space for idea generation, contentment, and tolerance. By implementing these operational concepts in a common area users can work collaboratively, leading to their sustained use of library services and satisfaction.

4.3.1.5 Comfort and Image

COMFORT IMAGE WITH EDUCATION 4.0

Librarians have reached a consensus that the clear definition of new physical learning space images is a necessary action to improve the comfort and image of libraries in the users' eyes. Librarians point out that comfort culture practices in library learning spaces are commonly associated with words such as quiet, illumination, seating, inviting spaces, and friendliness. Some librarians have posited a close relationship between these practices and users' adherence to noise-level policies, as well as notions of freedom and relaxation. They have also noted that many newly built libraries are adopting modern comfort designs that prioritize a theme of freedom and relaxation.

Librarians point out that the noise-related issues in libraries are strongly linked to the degree of comfort that users experience during their learning process. Despite

the fact that the concept of comfort is often narrowly defined, librarians also share with the points to agree that research has demonstrated that noise can impact users' sense of physical relaxation within the library environment. Unwanted noise can disrupt the pleasant atmosphere that users seek while engaging in learning activities at the library.

Librarians point out that developing a practical understanding of how to meet users' needs is strongly tied to the concept of comfort. The experience of users is a crucial aspect of creating a comfortable and enjoyable environment that gives a sense of security while using services. Librarians must identify and address the activities that align with students' experiences to ensure their comfort and satisfaction while using the library. This has become a challenging task for librarians.

Additionally, librarians have agreed that quantifying the standard level of noise in decibels is a valid method for regulating noise levels in the library. These new images aim to reflect the library's transformation, specifically in enhancing user connectivity for collaboration, which in turn contributes to the overall comfort experience of the library's users.

Librarians generally agree that creating appropriate noise levels, fostering user connections in library spaces, and promoting collaboration require changes to physical learning spaces. These changes should prioritize user comfort rather than merely catering to popular demand. These changes must be implemented with care and responsibility. Staff should be empathetic when dealing with learning-related discussions to ensure a positive impact on users. New images should also be considered for collaboration activities in libraries.

According to librarians, it is now a common concern for them to ensure that users have a pleasant learning environment, given the subjective nature of what makes users comfortable. Many librarians feel anxious when interacting with diligent users who seek to discuss and clarify academic work with others. This is often attributed to the knowledge creation process, which is recognized as a learning strategy by MOHE, as highlighted by several librarians.

COMFORT IMAGE AND NOISE DETECTION MACHINE

Based on the quantitative data collected, it was discovered that an automatic noise monitoring system can mitigate users' concerns about disturbing others while studying or working together. Quantitative data revealed that respondents who consistently used a shared area for studying and collaborating had positive opinions about it and continued to use the area because it provided a great space for these activities. The librarians seemed to agree on the definition and use of the noise detection machine in the library. The majority of librarians expressed that it should be integrated into the library as an alert system because of its reliable performance, which would benefit both the library management and users.

Librarians point out that learning space is one of the primary focused on library services content. Librarians related the welcoming and comfortable learning environment with users' needs for the proper management of noise issues in library learning space. Noise able to contribute negative perceptions of discomfort feeling. Noise will be caused physical learning space discomfort as disturbance from other users can lead to negative emotional responses that will directly impact negatively students' learning experiences.

To provide comfort learning space, the majority of librarians concurred that the use of noise detection devices can aid in preserving the crucial aspect of silence in libraries and serve as a useful tool in addressing noise-related concerns. It was established that the present open space configuration does not align with the idea of quiet learning. Librarians highlighted that it is imperative to monitor noise levels in shared areas as a possible solution to noise disturbance. Since noise is a matter of personal perception, it is essential to be vigilant and not overlook the issue.

Numerous librarians have emphasized that the library's lack of a defined noise level standard can make the library an uncomfortable and hindering environment for users who are trying to learn. The library's lack of a noise policy has resulted in a less comfortable and inclusive environment. To address this, librarians have recommended that the library management create a policy to regulate noise levels. Establishing clear guidelines and policies is crucial for transforming collaborative learning spaces in academic libraries in Malaysia. To achieve this, it is important to foster a respectful

and comfortable learning environment and promote learning, collaboration, and community engagement. Moreover, it is important to apply these guidelines fairly and consistently to all library users.

Librarians emphasized the need for close monitoring and management of acceptable noise levels in the library, which can be adjusted based on the situation. The subjective nature of noise makes it difficult for users to judge, thus highlighting the importance of a noise control policy and detection machine in the library. Unlike a café or community hall, the library is a space for interaction between users and librarians, and uncertainty and inconsistency can negatively impact user comfort and use of library services.

Due to their limited manpower and inability to constantly monitor the library for unexpected noises, a majority of librarians have accepted the use of noise detection machines. A noise detection machine is used as a sensor to monitor and track noise levels in a library. It serves as a sensor to keep track of the noise levels allowed in the library and alerts users through an alarm noise and an LCD indicator if the noise level surpasses the allowed parameter. The statistical information displayed on the LCD and the alarm noise of the noise detection machine is believed by most librarians to be a helpful way to avoid any further confusion for library users. This kind of warning system is highly reliable to both the library management and users. However, introducing these changes might be the first step in encouraging users to adopt new norms of behavior in the library.

AMBIENCE AND GUIDELINES IN THE LIBRARY

According to the quantitative data, most of the participants showed a preference for a library with contemporary themes. In addition, a majority of librarians also expressed their liking for a modern theme library that offers a conducive learning environment. Librarians believe that the physical learning space's ambiance is closely related to up-to-date equipment, furniture design, and daily operational policies.

Descriptors commonly used to describe a modern physical space by librarians include "trendy" and "casual," which helps to create a vibrant learning environment. Such an environment allows for open communication, group learning, energetic and interactive activities, and relaxed learning styles. Additionally, modern libraries are

equipped with cutting-edge technology and offer social events to encourage user engagement in a safe and welcoming atmosphere.

The modern image is associated with a particular atmosphere that encompasses cutting-edge furniture, shared learning spaces, digital education support, minimal shelving, and high-tech media equipment that maximize space usage. Such an environment fosters a dynamic and relaxed atmosphere that stimulates both satisfaction and effective learning, while also encouraging open and interactive communication. The design of this space is both futuristic and welcoming, in keeping with the current digital age and the evolving educational landscape.

Librarians point out that libraries need to stay current with the most recent developments and demands in education. To improve, librarians suggest incorporating noise allowances and a new image into library learning environments. The ideal image for a library ought to center around notions of freedom, open communication, the ability to share ideas, and the liberty to collaborate with fellow learners, all with a greater emphasis on ensuring satisfactory learning experiences and top-notch learning outcomes.

Librarians have correlated the environment with how users behave and the concerns related to noise. There is a societal tendency to associate noisy behavior in the library with behavioral issues. Furthermore, the concept of silence in the library is currently being viewed from the perspective of users' rights and fairness. It is expected that library users should honor each other's need for a quiet space. Nonetheless, the perception of noise and what qualifies as "too loud" can be subjective, and this subjectivity could result in bias, negative perceptions, unfair treatment, and judgments.

The librarians acknowledged that creating a tolerant and tranquil atmosphere for learning can only be achieved when both the users and the management understand their respective roles. Librarians have recommended that establishing a clear policy is fundamental to cultivating a cultured society, with regulations on noise levels serving as a framework for users' conduct within the library. They have further asserted that a well-defined policy is closely tied to issues of responsibility and fairness.

Librarians expressed that a physical learning environment with a noise policy is essential to legitimate, adaptable teaching methods. This is in alignment with the MOHE's objective of enhancing knowledge creation through user collaboration. The survey respondents noted that noise is a common occurrence in libraries due to the emphasis on group work in academia. The goal is to accelerate the provision of a conducive learning space that encourages connectivity and collaboration.

According to the feedback collected, controlling noise issues in libraries is challenging, especially in the current learning trend. The respondents clarify that the library users do not have attitude problems. Most users make noise for academic discussions, which is a vital part of their learning process. They engage in conversations with their classmates for assignments and academic clarification. Unfortunately, this behavior has been wrongly portrayed, making it seem like library users enjoy making noise.

Librarians concurred that enforcing a policy on noise levels in the library is a promising first step towards modernizing it. This policy serves to transform the library from a conversational space to a contemporary one, which will have an impact on users' behavior and norms. The noise level policy acts as a notification tool, offering exceptional dependability for both library management and users. Nonetheless, a few respondents argued that having a noise policy in libraries is redundant as librarians are already aware of their responsibilities in maintaining a silent atmosphere. However, adoption of MyHE4.0 instructional techniques, there are concerns about the potential impact on the library's physical services. It is necessary to establish a precise noise policy in the library, as the current conflicting circumstances have caused confusion and misguided judgments for users engaged in educational activities.

4.4 SUMMARY OF RESEARCH RESULTS

The collected quantitative and qualitative data provide evidence of a culture clash in libraries. Most of the respondents, librarians, and users, have the most positive feedback toward the transformation of the learning space in the library. The anxiety that librarians in Malaysia feel towards the current learning space setup in academic libraries is closely linked to the cultural conflict between library users and library

management. The quantification of noise levels in different areas of the library, the allowance of noise levels below 50 decibels (dB) in common areas, and the installation of noise detection machines in the library are all positive steps toward the transformation of the library space.

Transformation of physical learning space to support collaborative activities in common areas is the preferred learning space service by the users. Users' opinions towards the future services in the library is closely related to the operation trend. Future library metaphors are closely related to sociability as a comfort learning zone. A comfort zone accomplished with users' emotional and mental on its using behaviour in library learning space. Users need to understand the rights and the rules of the overall operation of the library.

Legitimacy of noise level of <50dB in library common areas might be the strategy in moving library metaphors from quiet, and formal into collaborative, informal learning, and active learning spaces. This is one of the challenges in the library transformation process. However, action must be taken as the current library metaphors have caused the services provided by academic libraries in Malaysia and the patrons' behavior in library unable to move concurrently with the changes in the education system in Malaysia.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 OVERVIEW

The transformation of libraries in Malaysia is a complex and ongoing process. Malik (2024) found that user satisfaction directly contributes to user loyalty in continually using library services. Library service value directly influences user satisfaction and leads to user loyalty. Library image, user trust, services provided by the library, and staff all play a role in these factors, directly influencing library service value and ultimately leading to user loyalty.

The study provides detailed insights and can serve as a policy guide for continuously retaining and increasing user satisfaction in library services. As noted, user satisfaction directly contributes to user loyalty in continually using library services. Library service value directly influences user satisfaction and leads to user loyalty. Library image, user trust, services provided by the library, and staff all play a role in these factors, directly influencing library service value and ultimately leading to user loyalty. Therefore, improving library service value is essential to provide good satisfaction services to users and achieve library service value to retain user loyalty and ensure continued use of library services.

This study aims to identify the optimal approach for implementing changes in academic libraries in Malaysia The study will explore the management of academic libraries and the preferences of their users in physical learning environments. The findings of the study will be used to inform the development of new policies and practices for academic libraries in Malaysia. The following chapter presents the findings of the study, along with a discussion of the theoretical framework and themes that emerged. The findings are presented in relation to the research questions and objectives, and the limitations of the study are also discussed. Finally, recommendations for future research in new contexts are provided.

The main areas of focus for researchers in this study were the patterns of user behavior in library learning spaces, the types of uncertainty practices that occur in

these environments, the need for and nature of the transformation of physical learning spaces in libraries in response to changes in user behavior, and the identification of sociability practices, types of spaces, and sounds that can be considered legitimate attributes of library learning spaces.

The researchers examined how users interact with library learning spaces, the challenges they face in these environments, and the ways in which they adapt their behavior to meet their needs. They also explored the potential for physical learning spaces to be transformed in order to better support user needs and learning outcomes.

The findings of this study have implications for the design and management of library learning spaces. The researchers recommend that libraries create spaces that are flexible and adaptable, that support a variety of learning styles, and that promote social interaction and collaboration. They also suggest that libraries provide clear guidelines to help users navigate library learning spaces and to minimize uncertainty.

The following objectives have been design in Chapter 1.4 in order to fulfill the aims:

1. To explore the impact of noise decibels on users' learning, abilities, and behavior in learning spaces in academic libraries in Malaysia.
2. To examine the misalignment between the current state of learning spaces and the needs and preferences of users in academic libraries in Malaysia.
3. To develop evidence-based recommendations for the transformation of learning spaces in academic libraries in Malaysia, taking into account the needs of users and the capabilities of library management.

The explanatory methodology are being applied in this survey. This survey uses both quantitative and qualitative methodology to explain the phenomenon under study. Quantitative methodology, such as experiments and questionnaires, are used to collect numerical data that can be analyzed statistically. Qualitative methodology, such as Zoom interviews, are used to collect more data about the participants' experiences and perspectives.

5.2 SUMMARY OF RESULTS AND DISCUSSION OF STUDY

The research seeks to explore how library users and library management perceive the areas of change in relation to the services that should be offered in the library learning environment. The study will use a mixed- methodology approach to collect data from both groups of stakeholders. Library users will be surveyed to gather their perspectives on the current state of library services and their desired changes. Library management will be interviewed to obtain their insights into the challenges and opportunities facing libraries in the 21st century. The findings of the study will be used to inform the development of new and improved library services that meet the needs of users and the expectations of management.

A study of interviews with librarians identified several themes of uncertain services and operations that need to be addressed. These themes include the impact of culture clash, education 4.0, rapid advancements in media and technology, the significant growth of online resources, the speedy retrieval of e-resources, the influence of online learning, and changes in users' behavior in the library due to the rapid use of e-resources during the COVID-19 pandemic. These factors have had a serious impact on the usage patterns of library users. It is a fact that library management tends to view the library as a traditional repository of books and other materials, while users are more likely to see the library as a space for learning and collaboration. This clash of cultures has led to a situation where library management is not meeting the needs of its users, which has in turn led to a decline in user attendance.

The utilization patterns of library services by users have undergone a significant transformation in recent years. This transformation has been influenced by a number of factors, including the availability of e-resources, the adoption of Education 4.0, the increasing popularity of online courses and assessments, improved living standards in Malaysia, the provision of comfortable accommodations in libraries, the development of favorable home-based learning environments, and the growing importance of practical experiences.

The proliferation of electronic resources (e-resources) has revolutionized the way that users access library materials. E-resources, such as online databases, e-

journals, and e-books, can be accessed from anywhere in the world, which has led to a decline in the number of users who visit libraries in person. In addition, the adoption of Education 4.0, a new educational paradigm that emphasizes collaboration and learning, has also had a significant impact on library usage patterns. Education 4.0 encourages students to work together to solve problems and create knowledge, which often requires access to library resources. in view of this, libraries are increasingly becoming hubs for collaborative learning and research. However, the traditional expectation of silence in libraries has created uncertainty for users about how to conduct collaborative learning in these spaces.

The increasing importance of collaboration in education has led to a shift towards more collaborative learning activities. This is reflected in the way that education is changing. As a result, students are being assigned projects with more collaboration activities. The increasing use of libraries as a resource for collaboration has posed challenges for libraries, such as the potential for noise, the use of library equipment, and the arrangement of furniture. Libraries must balance the need to provide a quiet space for study with the need to allow students to collaborate effectively. They must also ensure that library equipment is available and accessible to all students and that furniture is arranged in a way that facilitates collaboration.

The potential for noise problems in libraries can be a significant challenge for users who are trying to focus and collaborate effectively. Noise can be distracting and disruptive, making it difficult to concentrate on tasks or participate in discussions. Noise can be a significant source of distraction for library users, particularly students who are attempting to study or complete assignments in a quiet setting. Researchers who are attempting to conduct quiet work may also be affected by noise. Libraries can use a variety of strategies to mitigate noise issues. These include designating quality silent areas, establishing explicit noise regulations with decibel restrictions, installing noise detection devices to notify users when noise levels are excessive, educating users on noise etiquette, and providing earplugs and headphones to users who need them.

The improvement of living standards in Malaysia has led to changes in library usage patterns. As Malaysians have become more affluent, they have more disposable income to spend on home-based learning resources. This has led to a decline in library

usage, as people are now able to do their research and complete their assignments from home. Additionally, the growing importance of practical experiences has also had an impact on library usage patterns. As people are increasingly seeking out hands-on learning opportunities, they are less likely to visit the library for traditional research and learning purposes.

The traditional image of a library as a silent and still place has contributed to the decline in user attendance at the library. Academic libraries have traditionally been seen as places of quiet study and contemplation. This image is often reinforced by library policies that prohibit noise and disruptions. This image is no longer accurate. It has created the biggest challenges to the cultural divide in between between library management and users. Library management may still have the traditional image of a library in mind, while users may be more accustomed to the more collaborative environment. This can lead to conflict between library management and users, as there is a gap in expectations for appropriate behavior and courteousness.

Library management should be more receptive to the idea of creating a more collaborative learning environment in the library. One way to do this would be to designate common areas as collaborative learning spaces. Libraries with open floor plans and ample seating areas are more conducive to social interaction than libraries with closed-off rooms and limited seating.

Additionally, library management should work with users to develop clear noise policies that define acceptable noise levels in different areas of the library. For example, the noise level in common areas should be limited to less than 50 decibels. This is to ensure that patrons can enjoy a peaceful and quiet environment in these shared spaces. Noise levels above 50 decibels can be disruptive and interfere with sleep, work, and study. Finally, library staff should be trained on how to deal with noise and disruptions respectfully and professionally.

The themes collected in the research presented demonstrate the need for changes in the daily operations of the library. The proposed new operating style for the library would convert common areas into collaborative areas, allowing noise levels of below than 50 decibels in these areas. Noise detection machines would be implemented to monitor noise levels in common areas. This change would allow for

greater flexibility in how the library is used, while also ensuring that noise levels do not become disruptive. Ongoing revisions to the library's services are also necessary to meet the learning styles and needs of current users.

Although implementing these changes may have a significant impact on the traditional ways of the library, it is a positive step towards improvement. The introduction of new practices in libraries has led to a clash of cultures, as the traditional norm of quietness is being challenged by the need for collaborative and social activities.

A conflict between cultural norms is and has arisen in the library, as the traditional norm of quietude is at odds with the collaborative and social learning practices of some users. This conflict can be attributed to the diverse range of users who visit the library, each with their cultural expectations. Librarians must be mindful of these different cultural norms in order to create a welcoming and inclusive environment for all. The traditional image of libraries as quiet and silent places needs to be updated. New metaphors for libraries that emphasize the importance of noise control and user-centeredness need to be communicated to users. This will help to develop a new perception of libraries as places where people can learn and work without disturbance. Libraries should also provide training for staff on how to handle clashes between different daily practices. This will help to improve library services and create a more harmonious learning environment for users and staff. Ultimately, the goal is to create a library that is a dynamic and welcoming space for all. This can be achieved by using new metaphors that challenge traditional perceptions of libraries and by providing training for staff on how to manage conflict

The transformation of libraries' daily operational practices over time is evident, particularly in the 21st century. Originally, the library was a silent space where users were unable to communicate with each other, even in low whispers, for fear of disturbing others. However, users began to request a minimal level of talking to be allowed for their study purposes. Now, users are requesting that social activities be permitted in the library. This transformation reflects the changing needs of library users and the evolving role of libraries in society.

The practice of maintaining silence in libraries is a core component of the library's image. This practice has several advantages for library users and the learning environment, as it is a norm that has been accepted by society. Librarians should continue to uphold this good practice. As part of their services, librarians should continually manage noise issues. Although noise perception is subjective, it can be quantified by setting a decibel level limit for libraries. This allows libraries to monitor noise levels and maintain silence practices while also addressing subjective noise concerns. The ability of libraries to maintain the valuable practice of silence is still necessary.

The study found that libraries must continue to adapt to the changing needs of their users in the 21st century. This includes adopting new technologies, expanding their services, and responding to the changing demands of library patrons. The researcher's study identified a number of challenges facing libraries in the 21st century, including the increasing uncertainty of the information landscape. However, the study also found that a number of factors can mitigate these challenges and contribute to a positive learning experience for library users. These factors include:

- Acceptable noise levels, which allow for a variety of learning styles and preferences.
- Reduced situational control, which encourages users to take ownership of their learning.
- Empathetic staff, who are able to understand users' needs with the knowledge of policy guidance to help libraries transform into more welcoming and inclusive spaces.
- An inspiring learning environment, which is conducive to creativity and collaboration.
- A friendly and sociable atmosphere with clear guidelines for behavior fosters a sense of community among users
- A welcoming and modern ambiance, creates a relaxed and enjoyable setting for learning.
- Friendly and collaborative activities, provides opportunities for users to learn from each other.

- Both individual and group study, allow users to tailor their learning experience to their needs.These findings suggest that libraries can play an important role in supporting lifelong learning in the 21st century. By providing a welcoming and supportive environment, libraries can help users navigate the uncertain information landscape and achieve their learning goals.

The research found that in addition to other areas of transformation, artificial intelligence (AI) is essential for the future of library services. The use of AI-powered alerting services can help libraries improve their efficiency and effectiveness by reducing the need for human intervention in the monitoring of potential problems. The use of noise detection technology could help to improve the learning environment in libraries by providing users with real-time feedback on noise levels and prompting them to take steps to reduce noise, such as speaking more quietly or moving to a quieter area.

5.3 THEORETICAL IMPLICATIONS

In Chapter 1, the researcher's theoretical framework drew on the hierarchy of library users' needs theory and the hierarchy of learning space attributes model to explore the interrelationships between the learning space attributes of users' activities, sociability, and comfort image, and the user preferences, noise management practices, users' behavior, and noise levels of 40-55 decibels (dB). This was done to provide a comprehensive overview of the attributes that affect library users' experiences in library learning spaces in Malaysia. It is believed that these interrelationships will contribute to the highest level of the hierarchy of library users' needs, which is the community as the library.

User activities, sociability, and comfort are the three essential factors that determine the image of an academic library. These attributes can be used to develop a conceptual framework that defines in depth the attributes needed to achieve a higher tier of achievement community as a library, as outlined in the hierarchy of library user needs based on Maslow's hierarchy of needs.

The conceptual model extends this concept to learning spaces, asserting that students' perceptions of sociability and comfort are fundamental to their overall satisfaction with the library. Libraries should prioritize the creation of spaces that are both sociable and comfortable. This will help to attract and retain students, and it will also create a more positive learning environment for all. Students who perceived the library as being sociable and comfortable were more likely to be satisfied with the library overall.

The research revealed that noise levels in the library are closely linked to the comfort, sociability, and activities of its users. Users who perceived libraries as being sociable and comfortable were more likely to be satisfied with the library overall. The study also suggested that the enforcement of silence in libraries should be flexible, taking into account the noise levels present.

This study investigated the relationship between noise levels in learning environments and the hierarchy of library users' needs and learning attributes. The hierarchy of learning space attributes reflects the current trend in modern library design, which emphasizes the importance of noise control in learning spaces.

5.4 IMPLICATIONS OF FINDINGS: MALAYSIAN ACADEMIC LIBRARIES

5.4.1 Enrichment of Library Services

Academic libraries must evolve to meet the evolving needs and preferences of their patrons to effectively support their learning processes. This is crucial for libraries to remain relevant in education and satisfy user needs. Failure to adapt to changing user needs can render libraries obsolete in the educational landscape. This could lead to decreased usage, underutilized resources, reduced funding, and ultimately, a diminished ability to support educational needs.

This study investigates the need for transformation in the physical learning environment of libraries. It explores how library services and users' behavior have changed in response to the impact of technology, the implementation of Education 4.0, and the COVID-19 pandemic. The study identifies several areas of uncertainty

that need to be addressed in order to ensure that libraries continue to meet the needs of their users in the future. The findings contribute to the transformation of physical learning spaces, as this is important because the learning environment is correlated with the academic performance and well-being of students (Kim & Yang, 2022).

The study reveals a clash of cultures between library management and users, which has created a gap in expectations and resulted in a decline in user attendance. The findings suggest that the library must adopt a new approach to managing its services to cater to the learning styles and needs of its current users.

The library should focus on providing services that are aligned with the learning styles and needs of its users. The library should also work to bridge the gap in expectations between library management and users. By taking these steps, the library can reverse the decline in user attendance and become a more welcoming and relevant space for its community.

The proposed changes to the learning environment would aim to create a space where users can learn and work without distractions, while also reducing the amount of control that is exerted over them. Additionally, the social and environmental aspects of the learning environment would be enhanced to create a more comfortable and welcoming space.

Future implementation plans may include the installation of noise monitoring equipment that emits noise level notifications to regulate noise levels in libraries. The development of digital equity hubs in the library is also essential. These measures would help to improve users' learning experiences by reducing distractions and providing access to technology and resources.

The findings of this study will provide a deeper understanding of how librarians and library users perceive the essential changes required for library transformation. This knowledge will be valuable for librarians and library administrators as they plan for the future of libraries. The information provided can assist library management in developing budgets and plans for future physical learning space developments and changes to daily operations. This information can be used to identify areas for improvement, set priorities, and allocate resources. The

information can also be used to evaluate the effectiveness of current practices and to make informed decisions about future directions.

5.4.2 Suitable Noise Level in Academic Libraries in Malaysia

Incorporating certain noise levels in academic libraries can align with Malaysia's current Education 4.0 trend and evolving learning needs. Libraries must adapt their roles to support learning abilities and services. As noted by Orde (2010), libraries are transitioning to support learning. Milewicz (2009) emphasized that human conversation can be stimulating and positive. Education 4.0 focuses on critical thinking, problem-solving, and teamwork. Group study discussions foster mutual respect and positive relationships (Malakouti, 2010). Given these factors, Malaysian academic libraries need to establish appropriate noise levels to support contemporary learning needs.

5.4.3 To Legitimate Noise Levels in Academic Libraries

To legitimate and allowing certain noise levels in academic libraries might be a minor factor in resolving some issues faced by these libraries. Noise levels below 50dB may be applicable. However, these noise levels need to be justified and managed to address noise issues. Establishing acceptable noise levels in academic libraries can contribute to solving certain problems. With established noise level guidelines, library staff can work more effectively in handling and advising users on noise-related matters. This finding could positively impact user needs in academic libraries by better understanding and addressing their specific requirements, which directly influences library usage.

5.4.4 Installation of Sound Detector Meter in Academic Library Common Area

A sound detector meter can be installed in libraries to measure noise levels and alert users and staff about excessive noise. It provides scientific evidence and acts as a

basic tool for monitoring noise levels. Sound detector systems are readily available and have become more widely used.

5.4.5 Academic Library in Malaysia Support Education 4.0

Academic libraries in Malaysia are facing a paradigm shift in education, as Education 4.0 emphasizes the use of alternative assessment methods, project-based learning, and hands-on field experience. This shift will require libraries to adapt their services, daily operations, staff behavior, and physical spaces to support the needs of learners in the 21st century.

The changing nature of learning in the 21st century has necessitated a shift in the physical learning spaces of libraries. The attributes of these spaces are closely aligned with the skills necessary for 21st-century learning, such as collaboration, critical thinking, and creativity. This research investigates the impact of cultural differences between library users and staff on the use of these spaces. The goal of the research is to identify ways to mitigate the negative impact of these differences and to create more inclusive and welcoming learning environments for all library users.

5.4.6 Creating New Culture in Academic Libraries

A recent study found that library users prefer learning environments that support active, collaborative, and social learning. However, there is a discrepancy between users' preferences and library management's approach to learning space design. Library users require freedom and privacy to conduct their activities and learning, but librarians are primarily concerned with ensuring that the library is quiet. This discrepancy has resulted in the underutilization of library learning spaces.

Academic libraries in Malaysia are facing the challenge of adapting to the changing needs of their users. The traditional library model, which focuses on formal and serious learning, is no longer sufficient to meet the needs of today's students, who are increasingly using the library for collaborative and informal learning. In order to remain relevant, library managers need to identify the actual needs of their users and

redefine the library's learning space accordingly. One way to do this is to introduce a new library metaphor for learning spaces. The library could be seen as a third place, a space that is neither home nor hostel, where students can go to study, collaborate, and socialize. This new metaphor could help to create a more welcoming and inviting environment for students, and it could also help to attract new users to the library.

It is essential for both library users and staff to have a comprehensive understanding of the evolving nature of library space services and the new metaphors that represent them in order to fully utilize the library's learning resources.

5.4.7 Enhancing Socialization Opportunities in Academic Libraries Malaysia

The incorporation of socialization areas into the essential physical services provided by libraries in higher education institutions is a matter of academic importance. Socialization is a fundamental component of the learning process, and students require spaces in which to collaborate, network, and relax. Libraries can provide these spaces by creating areas for informal learning, group work, and social interaction.

5.4.8 New Metaphors for Public Understanding

As libraries evolve to offer new services and adopt new metaphors, library management should take on the responsibility of monitoring noise levels and establishing quantitative limits for acceptable noise in different areas. This will help to ensure a consistent learning environment and maintain the quality of library services. Noise control in libraries can be achieved through a variety of strategies, including educating patrons about noise levels, rearranging furniture, and installing soundproofing materials. Quantitative limits can be established for acceptable noise levels in different areas of the library, such as <40dB for quiet study areas and <50dB for collaborative space areas. Noise levels should be monitored on a regular basis using noise detention meters.

5.5 LIMITATION OF RESEARCH

The data collection process was impeded by a number of challenges, including the COVID-19 pandemic and the limited sample size from a specific state in Malaysia. The unpredictable nature of the COVID-19 situation in 2022 disrupted the data collection process, as it made it difficult to plan and execute data collection activities. Additionally, the limited sample size from a restricted area in Malaysia after the COVID-19 pandemic may have limited the generalizability of the findings. Phase I of the study involved quantitative data collection, which was conducted immediately after the full reopening of higher learning education campuses in Malaysia. Data was collected using experimental and questionnaire methods. In the second phase of the study, qualitative data were collected through Zoom interviews with librarians in academic libraries in Malaysia. The interviews were conducted without recording, as most participants requested this. The use of Zoom interviews in Phase II was justified by the fact that most participants preferred to conduct the interviews online. This was likely due to the ongoing COVID-19 pandemic, which made in-person meetings less feasible. The decision to conduct the interviews without recording was also justified by the participants' preferences. Many participants expressed concerns about their privacy, and they felt that recording the interviews would violate their trust.

Sampling size:- The academic library has a significant population consisting of librarians and users. Quantitative research methodology were employed only to the higher education, undergraduate students. Due to the cost and time for the researcher the sample will only be able to collate with higher education institutions available in Johor. However, the participants are involved in states in of Malaysia. The 384 participants involved in the study were from different parts of Malaysia. However, it is important to note that this sample size is not large enough to be representative of the entire Malaysian population. As such, it would be inappropriate to assume that the findings of this study apply to all Malaysians.

5.6 FUTURE RESEARCH

This research has identified several areas for further investigation. The assessment of noise levels in libraries and the effectiveness of noise detection devices in regulating excessive noise in academic libraries in Malaysia are still in their early stages. Additionally, several topics were not explored in this study, which future researchers should examine and analyze. These topics include:

- To identify the needs of different users of academic libraries across a range of courses and programs. The findings will be used to assess the feasibility of creating a collaborative learning space that can serve as a model for future library services.
- To determine the general user preference for utilizing the social learning environment (SLE) at various points throughout the semester. This includes the beginning, mid-semester, examination period, and end of semester. The findings of this study will provide valuable insights into how SLEs can be most effectively utilized to support student learning.
- To determine the correlation between the decrease in human interaction in libraries and user satisfaction. Specifically, to assess the relationship between the automation noise detection system and user satisfaction in order to determine the likelihood of the following two explanations: (1) the decrease in human interaction is caused by technological advancements and changes in communication, or (2) the decrease in human interaction is caused by users' behavior and attitude towards the utilization of library services.
- To determine the willingness of postgraduates, academic staff, and institution management groups to tolerate a noise level of less than 50dB in common areas. These individuals are either users of the library or are directly involved in its overall operations.
- To define the public's perception of library services can be improved by adopting new attitudes and metaphors that emphasize the social aspects of libraries.

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APPENDIX A

Transformasi Ruang Pembelajaran Perpustakaan

Terima kasih kerana meluangkan masa mengambil bahagian didalam kajian ini.

Tujuan kajian ini adalah untuk mengumpul pandangan tentang sikap, keutamaan dan tingkah laku pengguna perpustakaan terhadap isu berkaitan bunyi bising di ruang pembelajaran fizikal di perpustakaan akademik di Malaysia.

Bahagian A : Maklumat Am

1. Jantina : ☐ Lelaki ☐ Perempuan

2. Berapa kerap anda melawat perpustakaan dalam satu semester :-

☐ 1- 5 kali sebulan ☐ 6-10 kali sebulan ☐ Lebih daripada 10 kali dalam sebulan

Bahagian B : Sila pilih jenis perpustakaan kesukaan anda

1. Saya lebih suka perpustakaan dalam gambar :-

2. Saya lebih suka perpustakaan yang dapat memberi kawalan bunyi bising dalam gambar :-

Mesin : Perpustakaan memasang sistem pemantauan/sensor hingar automatik.

Manusia: Kakitangan perpustakaan menjadi "Shhhhler" untuk mengawal isu bunyi bising di perpustakaan.

3. Adakah anda bersetuju bahawa kawasan pembelajaran perpustakaan perlu mengalih tumpuannya daripada persekitaran yang serius dan formal kepada ruang pembelajaran yang lebih sosial?

☐ Setuju ☐ Tidak Bersetuju

Bahagian C : Penaung Terhadap Ruang Pembelajaran Kolaboratif Dengan Sistem Pemantauan Bunyi Automatik

Jika aktiviti kolaboratif dan perbincangan dibenarkan di kawasan umum perpustakaan anda, sila nyatakan pendapat anda mengenai pemasangan sistem amaran bunyi di setiap meja? Sistem akan menukar warna kepada merah jika paras hingar di kawasan sekitar menjadi terlalu tinggi (terlalu bising).

Anggapkan bahawa aktiviti kolaboratif / perbincangan adalah dibenarkan dalam perpustakaan anda dan terdapat peranti pemantauan bunyi bising yang dipasang di kawasan tersebut. Berikan pendapat dan perasaan anda dalam bentuk skala.

1	2	3	4	5
Sangat Tidak Setuju	Tidak Setuju	Tidak Pasti	Setuju	Sangat Setuju

No	Penerangan	1	2	3	4	5
A1	Saya suka belajar di kawasan umum perpustakaan dan melaksanakan aktiviti kalaboratif dengan orang lain.					
A2	Aktiviti kalaboratif di kawasan umum perpustakaan merupakan kaedah yang terbaik dan merupakan satu arus pembelajaran di Malaysia pada masa kini.					
A3	Saya akan kerap menggunakan kawasan umum perpustakaan jika pembelajaran secara kumpulan adalah dibenarkan.					
B1	Saya merancang untuk belajar dan bekerja dengan orang lain di kawasan umum perpustakaan.					
B2	Saya berminat menggunakan kawasan umum perpustakaan secara kerap bagi melakukan aktiviti pembelajaran secara peribadi atau kerja kumpulan.					

B3	Saya akan mencadangkan kepada rakan untuk menggunakan kawasan umum perpustakaan secara kerap bagi tujuan aktiviti pembelajaran dan melakukan kerja projek bersama-sama.					
B4	Saya berpandangan positif terhadap kawasan umum perpustakaan kerana ianya menyediakan kawasan bagi tujuan pembelajaran dan bekerja bersama-sama dengan orang lain atau secara berkumpulan.					
B5	Saya akan mencadangkan kepada rakan untuk menggunakan kawasan umum perpustakaan bagi pembelajaran dan projek kolaborasi.					
C1	Saya berpendapat sistem pemantau bunyi bising adalah satu kaedah terbaik dan keperluan jika perpustakaan membenarkan aktiviti kolaborasi.					
C2	Saya setuju bahawa sistem pemantau bunyi bising di perpustakaan dapat mengurangi kebimbangan saya terhadap ketidakselasaan pengguna lain pada bunyi bising yang saya lakukan apabila saya sedang belajar dan bekerja dengan orang lain.					
C3	Saya bersetuju bahawa sistem pemantau bunyi bising dapat mengurangi masalah bunyi dan meningkatkan mutu perkhidmatan perpustakaan.					

Bahagian D : Sila baca petikan di bawah dengan teliti

LAPORAN BANJIR TAHUN 2021

Terdapat empat jenis banjir yang sering berlaku di Malaysia. Jenis banjir pertama ialah banjir monsun. Ianya berlaku semasa musim monsun timur laut akibat daripada hujan lebat berpanjangan dalam tempoh yang lama dan banjir lambat surut. Jenis banjir kedua ialah banjir kilat. Ianya berlaku akibat hujan yang sangat lebat dalam tempoh masa yang singkat yang menyebabkan kenaikan air banjir secara cepat dan mendadak namun air banjir cepat surut. Jenis banjir yang ketiga ialah banjir pantai. Ianya terjadi apabila berlaku pertembungan hujan lebat dan juga situasi air pasang yang menyebabkan kawasan persisiran pantai mengalami situasi banjir. Dan banjir keempat ialah banjir genang. Ianya berlaku di kawasan rendah dan aliran air banjir tidak dapat keluar dengan cepat kerana permukaan bumi yang rendah.

Kita menerima banjir sebagai proses semulajadi yang tidak dapat dikawal sepenuhnya dan banjir hanya menimbulkan masalah apabila air banjir mengganggu aktiviti manusia. Langkah-langkah penyelesaian jangka panjang yang dapat dilakukan oleh pihak berkuasa termasuk melaksanakan kajian dan projek tebatan banjir untuk kawasan yang sering mengalami banjir, serta memberikan nasihat kepada pihak berkuasa tempatan untuk meningkatkan sistem saliran agar dapat menampung air larian permukaan saat terjadinya hujan lebat. Selain itu, pendekatan "control at source" dapat dilakukan dengan menyediakan kolam takungan sementara untuk menahan air dari kawasan pembangunan yang meningkatkan air larian permukaan saat hujan lebat. Hal ini dapat mengatasi masalah ketidakmampuan kapasitas sistem saliran dan sungai. Menyediakan pelan induk sistem saliran untuk kawasan-kawasan berisiko banjir dengan mempertimbangkan taburan hujan saat ini dan kapasitas saliran yang ada juga merupakan langkah yang baik. Fenomena perubahan cuaca juga berkontribusi pada ketidaktentuan terhadap kekuatan dan magnitud suatu fenomena cuaca yang dapat mencatat kondisi ekstrem.

Banjir disebabkan oleh beberapa faktor termasuk sistem saliran yang tidak mampu menampung air larian permukaan karana tersumbat oleh sampah sarap dan kelodak yang disebabkan oleh pembangunan atau kerja tanah di sekitar kawasan. Selain itu, sistem saliran tidak mampu menampung peningkatan air larian permukaan yang mendadak akibat hujan lebat yang berkeamatan tinggi dalam masa yang singkat. Faktor lain termasuk limpahan air sungai yang disebabkan oleh hujan berterusan dan kesan pelepasan air dari empangan, pemendapan dasar sungai yang mengakibatkan sungai menjadi cetek dan sempit, perubahan corak gunatanah yang disebabkan oleh pembangunan setempat yang tinggi dan pesat dan kurangnya kawasan telap air.

Bilangan banjir yang berlaku di seluruh Malaysia pada tahun 2021 ialah sebanyak 1057 kejadian banjir. Negeri Sarawak mencatatkan bilangan kejadian banjir tertinggi iaitu sebanyak 270 kejadian banjir. Manakala Perlis hanya mencatatkan 3 kejadian banjir untuk tahun 2021. Banjir yang berlaku di negeri Kelantan,

Terengganu, Pahang, Sabah dan Sarawak adalah disebabkan oleh hujan lebat pada bulan November 2021 hingga bulan Disember 2021. Banjir di negeri-negeri di pantai barat seperti Pulau Pinang, Perak, Selangor, Melaka dan Wilayah Persekutuan Kuala Lumpur dikenalpasti sebagai banjir kilat disebabkan faktor hujan lebat yang berkeamatan tinggi ditambah pula dengan pertambahan kawasan yang telah pesat membangun menyebabkan kejadian banjir kilat akan bertambah buruk.

(Diubahsuaikan daripada laman web http://h2o.water.gov.my/man_hp1/LAPORAN%20BANJIR%20TAHUN%202021%20FINAL%20e-ISSN.pdf)

Bahagian E : Sila jawab soalan-soalan berikut :-

1) Apakah jenis-jenis banjir yang sering berlaku di Malaysia?
   i) Banjir monsun
   ii) Banjir kilat
   iii) Banjir pantai
   iv) Banjir Laut

   a) i dan ii
   b) i, dan iv
   c) i, ii dan iii
   d) i, ii, iii dan iv

2. Mengapakah banjir terjadi?
   i) Hujan lebat
   ii) Air pasang laut yang tinggi
   iii) Halangan aliran air di dalam sistem saliran
   iv) Sungai yang semakin cetek

   a) i dan ii
   b) i, dan iv
   c) ii dan iii
   d) i, ii, iii dan iv

3. Apakah langkah penyelesaian jangka panjang untuk mengurangkan impak kejadian banjir?
   i) Melaksanakan kajian untuk kawasan yang sering mengalami banjir
   ii) Menyediakan kolam takungan sementara
   iii) Pemulihan habitat bakau
   iv) Meningkatkan sistem saliran

   a) i dan ii
   b) i, ii dan iv
   c) i, dan iii
   d) i, ii, iii dan iv

4) Apakah yang dimaksudkan dengan banjir monsun ?
   a) Banjir monsun terjadi sebanyak empat kali dalam satu tahun.
   b) Banjir monsun terjadi semasa musim monsun barat laut di Malaysia akibat hujan lebat berpanjangan dalam tempoh yang lama.
   c) Banjir monsun terjadi semasa musim monsun timur laut di Malaysia akibat hujan lebat berpanjangan dalam tempoh yang lama.
   d) Banjir monsun terjadi dalam musin hujian dengan kenaikan air banjir secara cepat.

5) Apakah yang dimaksudkan dengan banjir genang?
   a) Banjir genang adalah banjir yang berlaku pada musin kemarau
   b) Banjir genang adalah banjir yang berlaku di kawasan rendah dan aliran air banjir tidak dapat keluar dengan cepat
   c) Banjir genang adalah banjir yang berlaku di kawasan tinggi
   d) Banjir genang adalah banjir yang berlaku di kawasan hutan bakau

6) Berapakah bilangan banjir yang berlaku di seluruh Malaysia pada tahun 2021?
   a) Sebanyak 1057
   b) Sebanyak 1705
   c) Sebanyak 1507
   d) Sebanyak 1207

7) Pada tahun 2021 negeri apa yang mencatat bilangan kejadian banjir yang tertinggi di Malaysia?
   a) Sabah
   b) Sarawak
   c) Pulau Pinang
   d) Johor
   e) Kelantan

8) Berapakah bilangan kejadian banjir yang tercatat di negeri Perlis pada tahun 2021?
   a) 10 kejadian banjir
   b) 20 kejadian banjir
   c) 8 kejadian banjir
   d) 3 kejadian banjir

9) Negeri-negeri pantai barat yang dikenalpasti sebagai negeri banjir kilat termasuk :-
   i) Johor
   ii) Wilayah Persekutuan Kuala Lumpur
   iii) Selangor
   iv) Pulau Pinang

   a) i dan ii
   b) ii dan iv
   c) ii, iii dan iii
   d) ii, iii dan iv

10) Negeri-negeri yang dikenalpasti belaku banjir disebabkan oleh hujan lebat pada bulan November 2021 hingga bulan Disember 2021 ialah :-
   a) Johor
   b) Terengganu
   b) Perlis
   c) Perak

Bahagian F : Sila baca petikan di bawah dengan teliti

Hubungan Antara Jenayah Penipuan Internet Dengan Pengurusan Produktiviti Pekerjaan

Jenayah penipuan siber telah menjadi satu ancaman global malah telah membawa kesan negatif kepada pengguna Internet dalam dunia siber yang kini semakin berkembang. Penipuan siber merujuk kepada penipuan yang berlaku dengan menggunakan instrumen komputer untuk menjadikan laman siber dalam menjalankan aktiviti jenayah. Malaysia menzahirkan kebimbangan ke atas kadar jenayah siber yang dijangkakan sebanyak 10,000 kes dilaporkan setiap tahun. Penipuan internet bukan sahaja berlaku kepada remaja, namun terdapat juga orang dewasa yang menjadi mangsa. Hal ini disebabkan oleh sifat manusia yang tamak dan kecuaian pengguna dan juga kecuaian pembeli itu sendiri.

Kebelakangan ini kes jenayah siber telah meningkat sekali ganda lebih berbanding dengan jumlah kes yang telah dilaporkan. Sebagai contoh, menurut Menteri Sains, Teknologi dan Inovasi Datuk Seri Madius Tangau, penipuan dalam talian yang dilaporkan pada tahun 2015 adalah sebanyak 3,257 kes, kerugian nilai dalam penipuan siber telah dicatat sebanyak RM2.7 juta pada tahun 2016. Menurut laporan statistik pada tahun 2018, sebanyak 8,313 kes penipuan siber membabitkan wang berjumlah kira-kira RM300 juta telah direkodkan daripada Jabatan Siasatan Jenayah Komersial (JSJK), Polis Diraja Malaysia (PDRM).

Berdasarkan laporan statistik yang dikeluarkan oleh Bahagian Siasatan Jenayah Siber dan Multimedia PDRM, kes penipuan cinta siber atau lebih dikenali sebagai African Scam dilaporkan semakin meningkat. Pada tahun 2013 sebanyak 1095 kes penipuan cinta siber dilaporkan berbanding hanya 814 kes pada tahun 2012. Begitu juga dengan kes penipuan pembelian barangan secara atas talian, dimana sektor yang terlibat dalam penipuan pembelian barangan secara atas talian ialah seperti automobil, perumahan dan pelancongan. Pada tahun 2015, penipuan pembelian barangan secara atas talian ini telah mencatatkan kerugian melebihi RM4.9 juta pada tahun 2015.

Sebagai contoh 'Phising' merupakan tindakan pencurian data diri atau biodata seseorang, mulai dari nama penuh, tarikh lahir, nama ibu kandung, alamat mangsa sehingga nombor identiti mangsa. Tujuan "phising" ini adalah untuk mengakses nombor pin bank mangsa, ataupun untuk menyampaikan sesuatu yang berunsur fitnah dengan menggunakan jati diri mangsa penipuan.

Dalam membanteras penipuan siber dan juga memastikan kedaulatan undang-undang demi keharmonian di kalangan masyarakat Malaysia, kerajaan Malaysia telah menggubal akta berkaitan siber sejak awal perkembangan teknologi dan maklumat. Akta-akta khas yang terdapat bagi menangani jenayah siber serta penyalahgunaan menerusi medan siber adalah seperti: Akta Jenayah Komputer (1997)23, Akta Komunikasi dan Multimedia (1998)24 dan Peraturan-Peraturan Perlindungan Pengguna (Urus Niaga Perdagangan Elektronik) 2012.

(Diubahsuaikan daripada lama web : https://www.researchgate.net/profile/Nasim-Khan4/publication/332446157_HUBUNGAN_ANTARA_JENAYAH_PENIPUAN_INTERNET_DENGAN_PENGURUSAN_PRODUKTIVITI_PEKERJAAN/links/5cb5e09a92851c8d22f0952c/HUBUNGAN-ANTARA-JENAYAH-PENIPUAN-INTERNET-DENGAN-PENGURUSAN-PRODUKTIVITI-PEKERJAAN.pdf

Bahagian G : Sila jawab soalan-soalan berikut :-

1) Apakah yang dimaksudkan dengan penipuan siber?

   a) Penipuan siber merujuk kepada pameran jenayah kewangan di bank
   b) Penipuan siber merujuk kepada penipuan yang menggunakan sebahagian komputer
   c) Penipuan siber merujuk kepada penipuan yang dilakukan boleh warga asing kepada rakyat Malaysia
   d) Penipuan siber merujuk kepada penipuan yang berlaku dengan menggunakan instrumen komputer

2) Pada tahun 2016 berapakah kes jenayah siber yang dilaporkan?

   a) Sebanyak 15,000 kes
   b) Sebanyak 10,000 kes
   c) Sebanyak 20,000 kes
   d) Sebanyak 8000 kes

3) Apakah yang dimaksudkan dengan African Scam?

   a) African scam merujuk orang African yang melakukan Penipuan siber
   b) African scam merujuk penipuan cinta siber
   c) African scam merujuk penipuan siber melibatkan wang Afrika
   d) African scam merujuk berlaku di negara African

4) Berapakah jumlah kerugian bagi kes penipuan pembelian barangan secara atas talian pada tahun 2015?

   a) Kerugian melebihi RM5.9 juta
   b) Kerugian melebihi RM4.9 juta
   c) Kerugian melebihi RM4 juta
   d) Kerugian melebihi RM3.9 juta

5) Berapakah jumlah kes penipuan dalam talian yang dilaporkan pada tahun 2015?

   a) 3,921 kes penipuan
   b) 3,291 kes penipuan
   c) 3,527 kes penipuan
   d) 3,257 kes penipuan

6) Apakah yang dimaksudkan dengan 'Phising'?

   a) Phishing merujuk kepada teknik *penipuan telepon*
   b) Pencurian data diri atau biodata seseorang, mulai dari nama penuh, tarikh lahir, nama ibu kandung, alamat mangsa sehingga nombor identiti mangsa
   c) Phishing merujuk kepada teknik *penipuan WhatsApp*
   d) Phishing merujuk kepada teknik *penipuan menggunakan parcel*

7) Akta-Akta khas berkaitan dengan Jenayah Siber di Malaysia termasuk :-

i) Akta Jenayah Komputer (1997)23
ii) Peraturan-Peraturan Perlindungan Pengguna (Urus Niaga Perdagangan Elektronik) 2012
iii) Akta Komunikasi dan Multimedia (1998)24
iv) Akta Jenayah *Telepon* (1998)50

a) i dan ii
b) i, ii dan iii
c) ii, iii dan iii
d) i,ii, iii dan iv

8) Apakah tujuan pencurian data 'Phising'?

i) Mengakses nombor pin bank mangsa
ii) Hasil data yang mencurigakan
iii) Menggunakan program anti-virus untuk pencurian data
iv) Menyampaikan sesuatu yang berunsur fitnah dengan menggunakan jati diri mangsa penipuan

a) i dan iv
b) ii dan iv
c) ii, iii dan iii
d) i,ii, iii dan iv

9) Berapakah kes penipuan siber membabitkan wang yang direkodkan Jabatan Siasatan Jenayah Komersial (JSJK), Polis Diraja Malaysia (PDRM), sepanjang tahun 2018.

a) 10,000 kes penipuan
b) 8,313 kes penipuan
c) 8,998kes penipuan
d) 9,012 kes penipuan

10) Apakah punca utama berlaku penipuan internet.

i) Sifat tamak manusia
ii) Kecuaian pembeli sendiri
iii) Kecuaian pengguna
iv) Kualiti kumputer

a) i dan iv
b) i,ii dan iv
c) i, iii dan iii
d) i,ii, iii dan iv

No: Group:

Mark E : _____

Mark G : _____

Total Mark (E+G): _____

APPENDIX B

QUALITATIVE INTERVIEW PROTOCOL

The following questions and structure guided my conversations during interview session

Provide your expert opinion on the analysis findings of the quantitative research data in relation to the users' preferences, user behavior, and the overall operation of the library. Discuss the findings of the implementation in relation to the current library operations, and provide your views on the foreseeable problems, current issues, education paradigm, Education 4.0, and users' usage behavior in academic libraries in Malaysia.	
1	Academic library users' reading comprehension is not affected by background noise below 45 decibels
2	Academic library users' reading comprehension scores are not affected by background noise at 50 decibels.
3	The reading comprehension of users in academic libraries is affected by background noise levels of less than 55 decibels.
4	The reading comprehension scores of academic library users are significantly affected by the level of discourse noise. G1 versus G2= means difference is no statistically significant G1versusG3=statistically significant difference in means G2 versus G3 = Means difference is no statistically significant
5	The majority of respondents (62.8%) prefer a modern design for academic libraries
6	The majority of respondents (68%) prefer noise detectors to control and alert noise problems in academic libraries.
7	67.4% of the respondents believe that libraries should change.
8	The different levels of noise or preference library set up did not have a significant impact on the learning ability in reading.
9	Different levels of noise or preference of noise alerting methods did not have a significant impact on learning ability in reading.
10	Different levels of noise or users' preference on the need of transformation did not have a significant impact on learning ability in reading.
11	Users preference set up or users' preference on the need of transformation did not have a significant impact on learning ability in reading.
12	Users preference set up or users' preference on noise alerting methods in library did not have a significant impact on learning ability in reading.
13	Users preference on transformation in library or users' preference on noise alerting methods did not have a significant impact on learning ability in reading.
14	A majority (55.7%) of library users indicated that they would be more likely to study with others in the library's common area if the library employed an automatic noise monitoring system that would alert users to excessive noise levels.
15	21.1% strongly agreed and 45.8% agreed that collaborative work in library common areas is the best approach for the country's current learning trends, provided that the library employs an automatic noise monitoring system to mitigate noise levels.
16	70.3% of respondents indicated that they would be more likely to study frequently in the library's common area if an automatic noise alert system were used to notify users of excessive noise levels.

17	57% of respondents (16.1% strongly agreed and 40.9% agreed) indicated that they would be more likely to consider studying in the library and conducting collaborative activities in the library common area if the library employed an automatic noise alert monitoring system to signal when noise levels become excessive.
18	76.5% of respondents expressed their intention to use the library common areas regularly for both personal study and teamwork if the library implemented an automatic noise alert monitoring system to signal when noise levels exceeded a certain threshold.
19	70.1% of respondents (21.4% strongly agreed and 48.7% agreed) indicated that they would recommend the library's common areas to their friends for regular study and project collaboration, provided that the library employs an automatic noise alert monitoring system to signal when noise levels exceed a certain threshold.
20	A majority of respondents (68.8%) expressed positive views of the library common area as a great space for studying and working together with others, citing the allowance of discussion and the implementation of an automatic noise alert monitoring system.
21	75% of library users (21.6% strongly agreed and 53.4% agreed) indicated that they would be more likely to persuade their friends to make full use of the library's common areas for study and collaborative work if the library implemented an automatic noise alert monitoring system to signal when noise levels exceed a certain threshold.
22	A total of 65.1% of respondents (24.7% strongly agree and 40.4% agree) believe that an automatic noise alert monitoring system is necessary in library common areas where collaborative work activities are allowed.
23	65.2% of respondents (18.8% strongly agreed and 46.4% agreed) indicated that the implementation of a noise monitoring system in the library would alleviate their concern about disturbing others while studying or working alongside them.
24	A majority of respondents (24.7% strongly agreed and 41.9% agreed) expressed the belief that a noise monitoring system could help to mitigate noise issues and improve library services.

A Need Of Library Transform Its Services

- ✓ Do the current academic libraries in Malaysia provide learning space services that support the education program system in Malaysia?
- ✓ When I say "library transform" what do, you think and associate with?
- ✓ How are the needs of library users changing in terms of the facilities and spaces that they need?
- ✓ What are some challenges that libraries face in transforming their services, such financial?
- ✓ What is the future of library services?

Prefer Modern Set Up Library

- ✓ When I say "modern set up library" what do you think of?
- ✓ What are the features of modern libraries that attract users?
- ✓ How can library management support the creation of a modern library setup?
- ✓ What are the challenges of creating a modern library setup, if it balance the needs of different users?
- ✓ What are the future trends in modern library design?

Well-Informed Decisions Are A Valuable Understanding

- ✓ Is it important for libraries to make decisions based on evidence?
- ✓ Can libraries be successful if they make decisions based on instinct/ working experience?
- ✓ How can libraries offer guidance on how to use library physical space facilities and resources in library learning space?
- ✓ What are the best practices for making informed decisions about library space learning?

Offering Guidance Is A Valuable Understanding

- ✓ How do libraries help users?
- ✓ What are some challenges that libraries face in helping users follow their policies?
- ✓ How do libraries help users follow their policies?
- ✓ What are the challenges libraries face when guiding users?
- ✓ What are the benefits of helping users follow library policies?

Providing Assistance Is A Valuable Understanding

- ✓ What are the different ways that libraries can help people?
- ✓ How can libraries keep up with the changing needs of users?
- ✓ How can libraries help people use the library space peacefully?
- ✓ How can libraries prepare for the future of library assistance?
- ✓ What are the challenges of helping library users?

Learning Areas Shift From Formal To Informal

- ✓ What are the reasons why libraries are moving away from formal learning areas and towards informal learning areas?
- ✓ What do you think of when you hear "formal learning area"?
- ✓ What are the challenges of creating and maintaining informal learning areas in libraries?
- ✓ What are the advantages of informal and formal learning areas for students and researchers?
- ✓ What are the new ways that informal learning areas will be designed and used in the future?
- ✓ How do informal learning areas help people learn in different ways?

More Relaxed And Inviting Learning Space

- ✓ What do you think of when you hear "relaxing and inviting learning space"?
- ✓ What are the pros and cons of having more relaxing and inviting learning spaces for students?
- ✓ What changes can libraries make to be more relaxing and inviting learning spaces? And How do these aspects affect students' ability to focus and learn?
- ✓ How can libraries create more relaxing and inviting learning spaces?
- ✓ How did the COVID-19 pandemic change students' preferences for learning spaces? And What are the new trends in designing relaxing and inviting learning spaces in libraries?

Users Tend To Speck Positivity About Common Area For Group Studying (If The Library Implemented An Automatic Noise Alert Monitoring System As Signal)

- ✓ Do users like common areas for group studying?
- ✓ What are the most important things users look for in a common area for group studying?
- ✓ How do the physical features of a common area (e.g., size, noise level, furniture) affect how users feel about it?
- ✓ How do the library's policies and procedures (e.g., noise levels, food and drink restrictions) affect users' experiences?
- ✓ How do the characteristics of the group affect how users feel about common areas for group studying?

Users tend to recommend them to others about common areas for group studying (if the library implemented an automatic noise alert monitoring system as signal)

- ✓ What are the pros and cons of studying in common areas?
- ✓ Why do people recommend common areas for group studying?
- ✓ Are common areas seen as a more affordable option than other study spaces? Why.
- ✓ What factors do people consider when choosing a common area for group studying?
- ✓ How can we improve common areas to receive even more positive feedback?
- ✓ If people generally have positive things to say about common areas for group studying?
- ✓ What are some ways to improve common areas for group studying in order to receive even more favourable feedback from users?

Allow Group Studying At Common Areas Higher Rate Of Usage

- ✓ Will allowing group studying in common areas increase the number of people using them?
- ✓ Do common areas get used more when group studying is allowed?
- ✓ What percentage of students use common areas for group studying?
- ✓ Why do students choose to study in common areas?
- ✓ How can conflicts in-group studies be resolved?
- ✓ How can technology be used to improve group studies?

Fixed Level Of Noise Leading To Higher Users Satisfaction And Learning Experience

- ✓ Does noise affect how much people like using the library and how well they learn?
- ✓ What is the impact of noise on people's satisfaction and learning in the library?
- ✓ What does it mean for the noise level in a library to be fixed, do you agreed with it ?
- ✓ How can libraries be designed to make the noise level lower and improve people's satisfaction and learning?
- ✓ What are the pros and cons of having a fixed noise level in library learning spaces?
- ✓ What are the best ways to make libraries quiet and productive for learning? Is a fixed noise level a good way to do this?

APPENDIX C

CONSENT FORM

Library Transformation: Noise Level and Hierarchy of Library Users Need in Malaysia Academic Library

I, _____, agree to participate in the research project titled '**Library Transformation: Noise Level and Hierarchy of Library Users Need in Malaysia Academic Library**,' conducted by **Kat Mui Yen**. The researcher, Kat Mui Yen has informed and discussed the research project with me.

I have received, read, and retained a copy of the information letter. I have had the opportunity to ask questions about this research and received satisfactory answers. I understand the general purpose, potential risks, and methods of this research

I consent to participate in the research project. The following has been explained to me:

- This research may not directly benefit me, and there is no monetary compensation involved.
- My participation is entirely voluntary.
- I have the right to withdraw from the study at any time without consequences.
- I understand the potential risks, including any possible inconvenience, discomfort, or harm that may result from my participation in the research project.
- I agree that pseudonyms (e.g., Respondent 1) will be used to protect my actual identity.
- I understand that the overall research process is estimated to take one to two hours.
- No audio or video recordings will be conducted during any part of the research activities.
- Publication of results from this study will be on the condition of anonymity.
- Security and confidentiality of my personal information.
- I have the right to request a copy of the research findings and reports.

_____
Signature / Name / Date