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Postgraduate Students' Utilization of Web-based Library and Information Services during Covid-19 Pandemic

Husain Hashim¹, Shamila Mohamed Shuhidan¹, Norizan Anwar¹, Heriyanto Heriyanto²

¹ Faculty of Information Management, Universiti Teknologi MARA Selangor, Shah Alam, Malaysia

² Fakultas Ilmu Perpustakaan, Universitas Diponegoro, Indonesia

husainha@uitm.edu.my, shamila@uitm.edu.my, norizan8027@uitm.edu.my, heriyanto@live.undip.ac.id
Tel: +60122151030

Abstract

This study examined the status and factors of postgraduate students' utilization of Web-based library and information services on output and outcome dimensions. During COVID-19, an online survey was conducted using stratified sampling, collecting 527 respondents from 20 Malaysian public universities. Library technology, support, and environment were the factors affecting WBLIS utilization. Each factor scored highly on usefulness, research support, and virtual space dimensions. Electronic databases were utilized heavily, and digital reference services were used the least. Most respondents' results, research skills and strategies improved with WBLIS utilization. Overall, the paper presents the descriptive findings to benefit academic libraries and universities.

Keywords: Academic library; Web-based library and information service; Utilization; Covid-19

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1.0 Introduction

Academic libraries have been vital to the education and research of their university communities for many generations. The libraries need to connect their resources, services, and activities with the institutional goals of their parent institutions (Oakleaf et al., 2017) Apparently, in the Malaysian context, this is not new. However, the ongoing pressure on public universities to raise their worldwide profile has made it more important than ever for an academic library to demonstrate its worth, particularly in supporting the accomplishment of academic excellence and research output.

Aside from the economic pressures mentioned in the research (Kot & Jones, 2015), another obvious reason is the present digital world's challenges, which continue to change at a rapid pace due to the high rate of technological breakthrough. Academic libraries, without exception, have long been involved in the provision of web-based library and information services (WBLIS) through their efforts to manipulate internet, Web, and mobile technologies (Einasto, 2014) by providing their users with digital resources and virtual environment (Steward & Newman, 2017). Due to the Covid-19 pandemic, there is increased pressure to change and reshape priorities to address access and connectivity to resources, including redesigning the library websites, reallocating resources, planning massive online services, and developing online information literacy education (Rafiq et al., 2021; Martzoukou, 2020).

This paper covers WBLIS, which is a type of library service that is made electronically available and reachable to the user community, specifically through an Internet connection and the World Wide Web platform that academic libraries offer. WBLIS, as defined in this study,

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refers to the information services academic libraries provide to users in order to satisfy their information needs and interests, with a focus on postgraduate students' learning and research needs. In particular, during the pandemic period caused by the COVID-19 outbreak recently, postgraduate students in Malaysia were forced to work on their learning and research away from university campuses. An open and distance learning (ODL) mode was introduced and implemented across all universities (Shuhidan, 2021). In consequence, the demand for Web-based information resources grew, and university students should be facilitated to utilize the online space to become information-rich and digitally savvy, which would help them in their studies (Martzoukou, 2020). Therefore, this has placed a need for a study to focus on the measurement of WBLIS utilization, especially within the period of the epidemic. For this purpose, Salisbury and Peasley (2018) assert that library assessment should move away from relying solely on usage statistics, which may not show the direct value of a library to its institution, and instead look at how library usage affects students' experiences and academic outcomes.

2.0 Research gap

The review of the factors that influence WBLIS utilization in Malaysian higher learning institutions showed significant gaps in this study, including understanding the frequency of use and the attainment of learning and research outcomes. Much academic library research in Malaysia emphasizes surveys to measure user satisfaction and perceived service quality. Suziyana et al. (2016) evaluated students' views and levels of satisfaction with service quality at Universiti Malaysia Pahang (UMP). Kiran (2010) employed SERVQUAL dimensions to perform a comparative study on service quality and customer satisfaction at the Universiti Malaya (UM) library. Despite the fact that respondents in Kiran (2010) stated that library services had a positive impact on their teaching, learning, and research, no further explanation is provided for the outcome of WBLIS in terms of changes in their skills, competencies, and thinking and behaviors as outlined by Tenopir, Christian, Kaufman (2019).

Furthermore, there is a lack of research in Malaysia that emphasizes the frequency of use, which, according to Oakleaf et al. (2017), is crucial in assuming library usage from an output viewpoint. As a result, it becomes an interest of this research to investigate the context of WBLIS utilization from two perspectives: output (implicit) and outcome (explicit). These data, with reference to Tenopir, Christian, Kaufman (2019) and Soria et al. (2014) were gathered and derived from self-reported data contributed by postgraduate students. The respondents were given the freedom to report utilization data based on how frequently they believed they had used a WBLIS service point as well as the outcomes they had gained. In the context of this research, concerning the factors that influence WBLIS utilization, it is essential to connect them with postgraduate students' higher degree learning and research undertakings, as well as their decisions and choices in utilizing the services (Arif, Ameen, & Rafiq, 2018).

3.0 Research objectives

A study was initiated to examine the status and factors of postgraduates' utilization of WBLIS, particularly during the Covid-19 pandemic. In specific, the following objectives were addressed in this study:

3.1 To examine the status of postgraduate students' utilization of WBLIS in Malaysian academic libraries.

3.2 To investigate the factors influencing postgraduate students' utilization of WBLIS.

This study, among others, has been designed to collect and analyze descriptive findings, which are the focus of this paper. The results on the relationships between research variables are not emphasized in this article.

4.0 Literature review

A number of prior studies have revealed findings that are related to this study. After an initial search and analysis of the literature, three factors of WBLIS utilization were found to be important: library technology library support, library environment, and information literacy skills. Even though the literature and studies do not necessarily focus on the utilization of WBLIS per se but rather on the use of digital libraries, electronic libraries, digital or electronic library resources, or just libraries in general, these studies are still considered to be important to be referred to for the current investigation.

Internet and mobile devices affect library technology adoption (Einasto, 2014); hence, WBLIS Internet usage is escalating in the virtual environment (Maceviciute, 2014). Online information access is growing, and libraries have adapted to this advancement (Steward & Newman, 2017). Arif, Ameen, and Rafiq (2018) revealed that students used web library services to accomplish courses and tasks rapidly and timely. With an emphasis on postgraduate students, according to Edem and Egbe (2016), they used e-resources as a tool to do research, review literature, and attain general knowledge. WBLIS was mostly utilized by postgraduate students as they would gain benefits from the availability and accessibility of scholarly information on the Internet valuable to their research activities (Parbie, Phuti, and Barfi, 2021). Meanwhile, the perception that academic library users had of Web library resources as being difficult to use and lacking in usefulness had an impact on their poor utilization (Matusiak, 2012).

According to studies, library support comprises providing users with information sources, materials, programs, and expertise to use WBLIS. Blummer and Kenton (2018) emphasize academic librarians' initiatives to improve student learning outcomes. They found that offering library skills education and monitoring student learning outcomes would boost the visibility and worth of academic libraries to their parent institutions. Pauline (2020) also stresses library utilization. Despite being a user satisfaction study, this research can infer how users view library support, which influences their usage of academic libraries. Users believe the library to be well-stocked, with suitably organized materials and qualified, experienced staff. The findings show that relevant information resources, an access point, and learning, teaching, and research-friendly atmosphere increased academic library utilization.

Montenegro et al. (2016) discovered that the library's physical space, which includes study rooms, is a significant academic library facility where students may learn and use technological services and resources. Physical space has no influence on student performance, according to the study. Montenegro et al. (2016) believed the amount of data they had for the study was just not adequate to generalize to other academic libraries or institutions as they only looked at students at one research-based university in Chile. Still, this does not mean that students have no use for library spaces. In fact, according to Montenegro et al. (2016), more research can be done to find out what kind of value these places have.

Inadequate information literacy skills have also led library users to feel inadequate, confused, and apprehensive when using WBLIS. Consequently, individuals begin to seek out alternative information sources and/or abandon the activities at hand entirely (Killu & Otiye, 2016). This demonstrates the significance of information literacy since research by Ukachi (2015), and Ekenna and Mabawonku (2013) have demonstrated that it has a substantial correlation with students' usage of WBLIS. Ruzegea and Msonde (2021) underlined the effect of incorporating information literacy skills into postgraduate courses that helped them use electronic resources effectively.

5.0 Methodology

This study used quantitative method aiming at collecting data from postgraduate students of 20 public universities. The Raosoft calculator determined a sample size of 383 for the actual data collection, and stratified sampling was employed to represent three university clusters: research, comprehensive, and focused universities. On the basis of one or more shared characteristics, such as university types or clusters, the population was divided into relevant and meaningful strata, with each stratum represented in the sample (Saunders, Lewis, & Thornhill, 2019). A web-based questionnaire was created using a 5-point Likert Scale comprising 47 individual items. During the Covid-19 pandemic, the online questionnaire was administered and distributed using the Google Form platform. In line with Sekaran and Boogie (2016), the internet's ability to conduct online survey has enabled the study in reaching and engaging with postgraduate students in various cities and states around Malaysia. Data from 527 respondents were collected and analyzed using SPSS version 26 software to perform descriptive analysis.

5.1 Demographic profile of respondents

Table 1 displays the demographic information of the study's participants. First, out of 527 respondents, respectively, 231, 184, and 112 respondents were from comprehensive, research, and focused universities. By field of study, business and management are represented by 188 respondents, followed by 180 from science and technology and 159 from social science and humanities. As for the proportion of respondents by program level, there were 249 doctoral students, 275 master's degree students, and only 3 postgraduate diploma students. Last, male and female respondents were 362 and 165.

Table 1. Demographic profile

	Cluster	Frequency of responses	Percentage of responses	Cumulative frequency
Cluster	Comprehensive University	231	44%	231
	Research University	184	35%	415
	Focused University	112	21%	527
Field of study	Business and management	188	36%	188
	Science and technology	180	34%	368
	Social science and humanities	159	30%	527
Program level	Doctoral degree	249	47%	188
	Master's degree	275	52%	524
	Post-graduate diploma	3	1%	527
Gender	Female	362	69%	362
	Male	165	31%	527

In table 2, the utilization of WBLIS by postgraduate students may be broken down into three categories: research (501 responses), course assignments (267 responses), and personal use (118 responses).

Table 2. Purpose of WBLIS utilization

Purpose	Frequency of responses	Percentage of responses
Course assignment	267	50.7
Research	501	95.1
Personal use	118	22.4

Discussed below are further findings of the study, which are aligned with its research objectives to examine the status and factors of the utilization of WBLIS among postgraduate students.

6.0 Findings

It can be confirmed that no respondent reported that they had not used any of his or her academic library's WBLIS service points, which consist of library websites, WebOPAC, online databases, digital reference, and institutional repositories. Figure 1 shows respondents who only utilized one service point: institutional repositories (2), digital reference services (2), online databases (10), WebOPAC (6), and library

websites (19). Others have utilized more than one service point, with sixty-six respondents reporting that they had utilized all five WBLIS service points. The majority of respondents, amounting to seventy-nine, utilized online databases and library websites only.

The findings can be used by academic libraries to recognize the real status of WBLIS utilization among postgraduate students, especially at the time of Covid-19 pandemic. They need to realize that not all postgraduate students have utilized all the WBLIS service points offered. This information should, more crucially, help academic libraries in planning strategies to increase WBLIS utilization in the future, beyond the epidemic period.

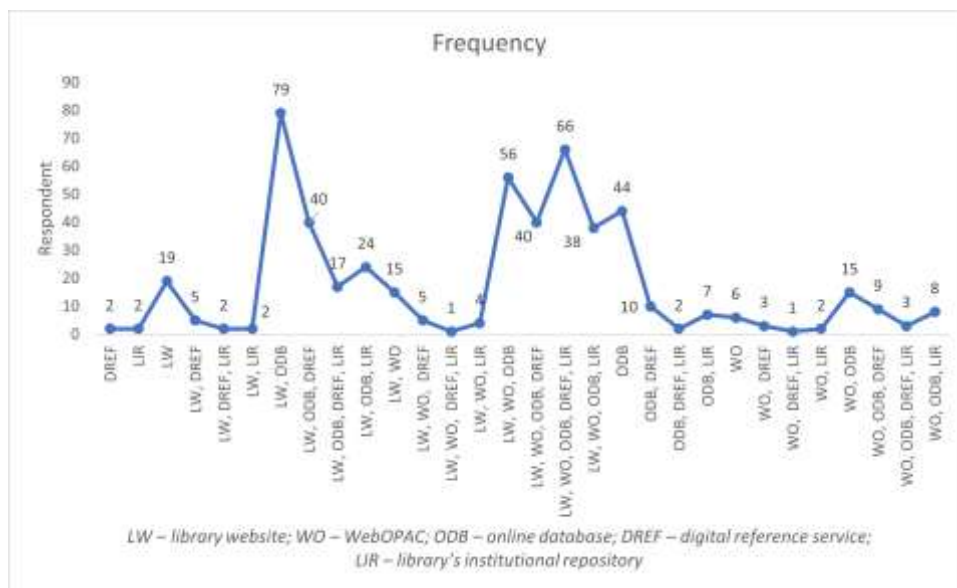


Fig. 1: WBLIS utilization by number of respondents and service points

Table 3 shows the means and standard deviations for four WBLIS utilization factors during the Covid-19 pandemic. The usefulness dimension of library technology scored 4.01, followed by ease of access (3.91) and ease of use (3.89). Learning support and research support had mean values of 3.83 and 3.84, respectively. The virtual space dimension in the library environment factor scored 4.61 and physical space 4.58. Last, ethical skills received 4.22, while cognitive skills obtained 4.02. In reference to the overall mean scores ranked from top to bottom, postgraduate students rated the library environment factor the highest (4.60), followed by information literacy skills (4.12), library technology (3.94), and finally library support (3.84).

Table 3. Utilization of WBLIS factors

WBLIS factor	Dimension	Mean	Standard deviation	Overall mean
Library technology	Ease of use	3.89	0.77	3.94
	Ease of access	3.91	0.81	
	Usefulness	4.01	0.82	
Library support	Learning support	3.83	0.91	3.84
	Research support	3.84	0.91	
Library environment	Physical space	4.58	0.74	4.60
	Virtual space	4.61	0.72	
Information literacy skills	Cognitive skills	4.02	0.77	4.12
	Ethical skills	4.22	0.74	

In this study, the output is the library usage perspective, taking into account university students' frequency of use of the five service points of WBLIS: library website, WebOPAC, online library databases, digital reference services, and the library's institutional repositories. Several items were adopted to measure output. As illustrated in Table 4, the overall mean for the output dimension is 3.88. "I utilize the online library databases from publishers or aggregators to locate and/or download journal articles" are the prevailing statements in output, followed by "I refer to the library website as the primary gateway to information sources and services." Overall, students mostly use online databases and library websites, with the digital reference service being the least often used. Table 5 presents the mean values for the items library website, WebOPAC, online databases, digital reference services, and library's institutional repositories, which are 4.15, 3.85, 4.48, 3.11, and 3.80, respectively.

Outcome perspective on utilization of WBLIS, taking into consideration the consequences of students using and reading the contents and information gained from the library website, WebOPAC, online library databases, digital reference services, and the library's institutional repository. Four items were adopted to measure the outcome. As illustrated in Table 4, the overall mean for the outcome dimension is 4.06. "Utilizing WBLIS contributes to the improved results in my study" and "utilizing WBLIS helps me to enhance my research skills & strategies" are the prevalent statements in the outcome, followed by "Utilizing WBLIS inspires new ideas and thinking in my study". Table 5 presents the mean values for each of the four items of outcome dimension, which are 4.02, 3.98, 4.11, and 4.11.

Table 4. Utilization of WBLIS: output and outcome dimensions

Dimension	Service points/items	Mean	Standard deviation	Overall mean
Output	I visit to the library website as the main portal to information sources and services	4.15	0.931	
	I use WebOPAC to retrieve materials from the library's collections	3.85	1.063	
	I utilize the online library databases from publishers or aggregators to download electronic materials	4.48	0.854	
	I send reference inquiries via e-mail/online chat/personal messenger on social media to ask librarian for advice and help	3.11	1.273	
	I search the library's digital institutional repository to access the intellectual outputs contributed by faculty, staff, and students	3.80	1.125	3.88
Outcome	Utilizing WBLIS inspires new ideas and thinking in my study	4.02	0.840	
	Utilizing WBLIS helps me to justify the plan and focus of my study	3.98	0.888	
	Utilizing WBLIS contributes to the improved results in my study	4.11	0.838	
	Utilizing WBLIS helps me to enhance my research skills & strategies	4.11	0.848	4.06

7.0 Discussion

This research's first factor is library technology. Out of its three dimensions, postgraduate students viewed usefulness as the primary reason for utilizing WBLIS during the outbreak, followed by ease of access and ease of use. Postgraduate students found WBLIS valuable for discovering trustworthy material, boosting information retrieval productivity, and searching for relevant content. Most postgraduate students felt that they could access WBLIS anytime, anywhere. In fact, ease of use had the lowest overall mean (3.89), compared to usefulness (4.01) and ease of access (3.91). Postgraduates found WBLIS accessible, clear, and learnable. The data found and provided on library technology's ease of use, ease of access, and usefulness indicates its relevance with WBLIS utilization as supported by Yoon (2016) and Arif, Ameen, and Rafiq (2018).

Learning support includes five items, and research support has four; each has a mean of 3.83 and 3.84. Postgraduate students thought that academic libraries had supported study and research adequately. Out of the nine items, students valued the library's research tools (e.g., EndNote, Mendeley, Zotero, RefWorks) as being most helpful in managing literature citations for their writing. They also felt reliant on library research sources to keep them current in their areas of study. The current study aligns with Salisbury and Peasley (2018), who found that academic library support adds greatly to study and research success, helping students feel linked to the institution and a part of university life in the library.

The library environment is the third factor in the utilization of WBLIS among postgraduate students. It is divided into physical space and virtual space in standards and recommendations. According to this study's results, the library environment is the essential factor, as assessed by postgraduate university students, with physical space and virtual space having mean scores of 4.58 and 4.61, respectively. Beard and Bawden (2012) emphasize the need for academic libraries to meet student's unique learning requirements and preferences. During the period of Covid-19, having virtual proximity to the library staff whom they could find assistance while they were away from the campuses and libraries. In this regard, the virtual space is provided via such platforms as online chat, email, and messengers. Research shows that postgraduate students value both physical and virtual settings equally (Beard & Dale, 2010). Students seek flexible and agile library space to support mixed and virtual learning. As current research concerns postgraduate students, they favor quiet, pleasant, and suitable study and learning environments over library discussion areas. Beard and Bawden (2012) note that self-study impacts research students' demand for personal space.

This study indicated that postgraduate students had good information literacy skills. Both dimensions scored above the value of 4.0, with students ranked ethical skills higher than cognitive skills. These findings were supported by Alam and McLoughlin (2010), who claimed that cognitive and ethical skills are crucial to the world's requirement for just and critical global citizens. For ethical skills, they rated highest on their awareness of plagiarism's influence on higher education and their frequent practice of producing citations, using quotations in text, and creating bibliographic entries for others' works. Students ranked cognitive skills by their ability to identify relevant information, define desired information, use search techniques, synthesize newly received knowledge, and assess information sources.

8.0 Conclusion and Recommendations

This study has implications in the form of substantial evidence for factors such as library technology, library support, the library environment, and information literacy skills, all of which will aid top management, professionals, and practitioners at academic libraries, particularly in Malaysia, in improving the provision and utilization of WBLIS among postgraduate students. In developing strategies for academic libraries in the twenty-first century, particularly in the post-Covid-19 era, as highlighted by Boyce et al. (2019), they must confront the challenges of digital infrastructure in offering more personalized services, addressing diversity, and providing university library users with an "embodied experience." Next, it is an important aspect of academic libraries' responsibilities to instill a culture of lifelong learning in the next generation of Malaysians. Based on their research proving that postgraduate students make the best use of e-resources, Ruzegaa and Msonde (2021) advocate introducing information literacy education into the curriculum. Thus, Malaysian academic libraries should continue to demonstrate their worth to university top management and faculty by strengthening information literacy education and, in this study's perspective, by further increasing postgraduate students' use of WBLIS for learning and research.

The scope of this investigation was limited. This study only looked at one industry setting, which is public universities in Malaysia's broader higher education sector. The respondents for this study were postgraduate students from public universities. Future research can

broaden the populations—not just postgraduates, but also undergraduates and academicians—and investigate additional higher education institutions across the country, such as private institutions, polytechnics, and community colleges.

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Paper Contribution to Related Field of Study

The contribution of this paper is in relation to the field of library and information science.

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