Article

An Exploratory Comparative Analysis of Librarians’ Views on AI Support for Learning Experiences, Lifelong Learning, and Digital Literacy in Malaysia and Indonesia

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Abstract: Various articles suggest that artificial intelligence (AI) in libraries can enhance the learning experience, promote lifelong learning, and strengthen digital literacy. However, it is unclear if practicing librarians agree with these benefits. Malaysia and Indonesia, neighboring countries with similar library practices, may have differing or similar views on AI support for learning, lifelong learning, and digital literacy. To this effect, this study was conducted with the aim of assessing librarian perspectives on the support provided by AI in enhancing learning experiences, fostering lifelong learning, and advancing digital literacy initiatives. Additionally, it seeks to compare these perspectives between Malaysia and Indonesia. Using a survey research methodology and an online questionnaire as the data collection technique, the results of the analysis showed that librarians assessed the AI support for learning experiences, lifelong learning, and digital literacy favorably. It was also found that there was no significant difference in the assessments of librarians from these two countries. The contribution of this study is that it has provided empirical evidence regarding AI support in libraries, and developed a scale or measurement for assessing AI support for learning experiences, lifelong learning, and digital literacy. This instrument can be used as a guide when it comes to investing in AI technologies for libraries.

Keywords: artificial intelligence; librarians; learning experience; lifelong learning; digital literacy

1. Introduction

Artificial intelligence (AI) has a rich history that predates its recent surge in popularity. The concept of machines mimicking human intelligence has been explored for several decades, with early AI developments laying the foundation for the transformative technologies we encounter today. Despite its existence for several decades, the true extent of AI’s potential became more apparent in recent years, especially with the advent of groundbreaking models like ChatGPT [1]. The launch of ChatGPT marked a paradigm shift in the world of AI.

Libraries, like all other organizations in the digital age, are affected by the revolutionary impact of AI [2–4]. Advancements in technology have caused libraries to reevaluate their conventional functions and adopt inventive approaches [5,6]. Consequently, numerous libraries have encountered the significant influence of AI on their services and operations. The impact of AI on libraries is not just theoretical but also tangible, as libraries are actively striving to incorporate AI seamlessly into their daily operations [7–9].

Libraries serve as multifaceted establishments with several functions, one of which is to encourage learning experiences, cultivate lifelong learning, and enhance digital
literacy [10,11]. Libraries, traditionally seen as places where knowledge is stored, have transformed into dynamic environments that actively contribute to the educational progress of its visitors [12]. The incorporation of AI acts as a revolutionary instrument for libraries, enhancing their capacities to complete these vital functions. Libraries may significantly enhance learning experiences by implementing appropriate AI technologies. According to Masrek et al. [13], libraries enhance the learning experience of its users by offering a technologically advanced environment that supports lifelong learning and strengthens digital literacy programs.

Currently, the use and integration of AI in Malaysia and Indonesia are at an early stage, especially in the context of libraries [14]. Libraries in these two countries, including academic, public, and specialized ones, have not fully integrated AI into their operations [15]. Although generative AI, like ChatGPT, has been utilized in Malaysian and Indonesian libraries to some extent, its extensive implementation is still restricted. Articles from various viewpoints and opinions have suggested that the use of AI in libraries could enhance the learning experience, promote lifelong learning, and strengthen digital literacy activities [13,16]. However, empirical studies gauging librarians’ perspectives are still very limited. It is not well understood whether practicing librarians truly agree and affirm that the utilization of these AI tools can enhance learning experiences, promote lifelong learning, and enhance digital literacy.

Malaysia and Indonesia are two neighboring countries located in South Asia. These two countries have similarities in various aspects such as political, economic, technological, and social factors [17,18]. Regarding library practices, there are also similarities [19,20]. Therefore, when discussing librarians’ perspectives on AI support for learning experiences, lifelong learning, and digital literacy, do librarians in these countries have congruent or incongruent opinions and views? This is an interesting question that requires exploration, and for this reason, this study was conducted. Essentially, the objectives of this exploratory study are twofold. Firstly, it aims to measure librarian perspectives on the support provided by AI in enhancing learning experiences, fostering lifelong learning, and advancing digital literacy initiatives. Secondly, it seeks to compare these perspectives between Malaysia and Indonesia.

2. Literature Review
2.1. AI in Libraries

Extensive research has been conducted on the incorporation of AI in libraries, indicating a rising interest in utilizing sophisticated technologies to improve library services and operations. The research can be classified into many categories, providing insights into different aspects of AI deployment in library contexts. A prominent category consists of review and opinion papers that explore the possible advantages of AI for libraries [2–4]. Researchers and scholars investigate the potential of AI to transform information retrieval, automate monotonous jobs, and provide tailored recommendations, ultimately enhancing the overall effectiveness of library services. Previous research has also explored the extent to which libraries are prepared to adopt AI technology [5,6]. These investigations evaluate the readiness of libraries in terms of their organization and structure to implement AI technologies. They assess the viability of incorporating AI into library operations by examining elements such as infrastructure, staff training, and institutional support [14,21]. Comprehending the preparedness of libraries is essential for developing effective methods and frameworks to deploy AI efficiently.

Further classification of research examines the practical implementation of AI in libraries or by librarians [7–9]. The research in this field explores the degree to which AI technologies have been integrated into library workflows. It examines the difficulties encountered throughout the implementation process and the effects on user experiences. These studies provide essential knowledge about the practical implementation of AI in libraries, offering practical advice for individuals who are considering or currently undertaking the adoption process. Finally, a prominent issue in the literature revolves around the
advancement of AI applications that are specifically tailored to assist and enhance library services and operations. This research focuses on developing and applying AI-powered tools and systems specifically designed to meet the specific requirements of libraries. Illustrative instances encompass AI-driven categorization systems [22], recommendation engines for library resources [23], and intelligent chatbots designed to aid patrons [24]. Gaining insight into the evolution of these applications offers a strategic plan for libraries aiming to leverage the potential of AI to improve their services and offer a more enhanced user experience [25]. Collectively, the wide range of research on AI in libraries demonstrates a constantly changing subject that is propelled by the quest for inventive solutions and the improvement of library operations.

2.2. Learning Experience

The term “learning experience” refers to the comprehensive impact of educational interactions on an individual’s intellectual growth, abilities, and personal advancement. This encompasses both structured and unstructured components [26,27] and considers multiple factors, including the learning environment, interpersonal interactions, and the incorporation of technology. Libraries have proven to be highly effective in providing the space and resources necessary for intellectual and skill development. The diverse learning resources, coupled with advanced technology available in libraries, have enabled many individuals to acquire and enhance their knowledge and abilities. The significant learning support experienced by many library users has fostered a strong attachment to libraries, often making them a second home [28,29]. The integration of AI will undoubtedly enhance the learning experience of library users, as AI has the capability to provide more personalized learning resources efficiently and effectively.

2.3. Lifelong Learning

Lifelong learning encompasses the continuous, voluntary, and self-driven endeavor to acquire information and enhance personal growth over one’s entire life [30,31]. It includes a wide range of formal and informal learning opportunities that go beyond standard educational limits. The notion of lifelong learning acknowledges that the acquisition of skills and information is not confined to a particular stage of life or a formal educational environment, but rather is an ongoing and flexible process that adjusts to evolving demands and circumstances [32,33]. In a library setting, it is common to observe individuals of various ages, including older adults, engaging in reading and other educational activities [34]. Their presence in the library exemplifies the pursuit of lifelong learning, with the library serving as an ideal and conducive environment for such endeavors. The integration of AI can further enhance libraries by not only providing advanced learning resources but also offering adaptive technologies, and other supportive services [35].

2.4. Digital Literacy

Digital literacy encompasses the proficiency to efficiently access, understand, evaluate, and use information in various digital formats [36,37]. It includes a variety of proficiencies, ranging from fundamental tasks like navigating digital interfaces to more complex skills like critically assessing online content and safeguarding oneself in the digital realm [38]. Libraries are crucial in promoting the digital literacy of their users by providing access to digital resources, offering training sessions, and serving as guides in the online domain [39]. They actively engage in promoting awareness and cultivating proficiency in using digital tools and platforms, empowering individuals to effectively connect with information offered in many digital media. Librarians, who are skilled in information and digital literacy, assist patrons in developing their critical thinking skills to assess online content and equip them to confidently use digital technology. The integration of AI further enhances this process, allowing libraries to offer personalized learning experiences and tailored recommendations based on users’ digital literacy levels and learning preferences [13].
2.5. Critiques and Potential Issues of AI in Libraries

While the integration of AI in libraries offers numerous benefits, it is essential to critically examine the potential drawbacks and challenges associated with this technology. One major concern is the issue of privacy and data security [15]. AI systems often require extensive data collection to function effectively, particularly for personalized services. These data include user behavior, preferences, and interactions with library resources. The collection and analysis of such sensitive information raise significant privacy concerns. Libraries must implement robust data protection measures to safeguard user information and ensure that data are used ethically and transparently [40]. Additionally, there is the risk of data breaches, which can compromise user privacy and trust. Ensuring compliance with data protection regulations and fostering a culture of data ethics is vital to mitigate these risks.

Another critical issue is the potential for bias in AI algorithms [41]. AI systems are trained on large datasets, which may contain inherent biases. If not addressed, these biases can result in unfair or discriminatory outcomes, such as biased search results or recommendations. For instance, an AI system trained on a dataset with limited diversity may fail to adequately represent minority perspectives, thereby perpetuating existing inequalities [42]. Libraries must be vigilant in identifying and mitigating bias in AI systems by employing diverse and representative datasets, conducting regular audits, and incorporating feedback mechanisms to ensure fairness and inclusivity in AI-driven services [43].

The impact of AI on employment and the role of library professionals is also a significant concern. While AI can automate routine tasks, it may also lead to job displacement or a reduction in the demand for certain roles within the library [44]. This potential shift raises questions about the future of library employment and the skills required for library professionals. It is essential for libraries to balance the efficiencies gained from AI with the preservation of the human element that is central to library services. Investing in the professional development and continuous training of library staff to work alongside AI technologies can help mitigate job displacement and enhance the value that human expertise brings to library services [45].

The financial and infrastructural implications of implementing AI in libraries cannot be overlooked [46]. Developing, deploying, and maintaining AI systems require significant investment, which may be a challenge for libraries with limited budgets. Additionally, the integration of AI technology necessitates appropriate infrastructure, including hardware, software, and technical support. Libraries must carefully consider the cost–benefit ratio and ensure that the adoption of AI does not compromise other essential services [47]. Collaborations with technology partners, seeking external funding, and phased implementation strategies can help libraries manage these financial and infrastructural challenges effectively.

2.6. Hypothesis Development

Malaysia and Indonesia have a distinct and interrelated connection as neighboring countries with a shared ethnic and linguistic past [48]. The historical connections and cultural affinities among these nations have fostered a collective sense of identity and comprehension [48]. Both countries are part of the broader Malay Archipelago, which cultivates a strong sense of kinship between them [49]. The common legacy between Malaysia and Indonesia not only affects cultural traditions but also has an impact on diplomatic, economic, and social contacts between the two countries. The historical and cultural connection between these nations forms the basis for collaboration, cooperation, and mutual respect, resulting in a diverse collection of shared experiences and values.

Perceived AI support for the learning experience, as evaluated by librarians, encompasses their subjective judgments regarding the impact of AI tools on personalized learning, deep engagement, feedback improvement, timely content delivery, enhanced accessibility, and the cultivation of autonomy and self-directed learning among library users [50,51]. Perceived AI support for lifelong learning, as assessed by librarians, encompasses their
subjective judgments regarding the impact of AI tools on the motivation, autonomy, exploration, community engagement, adaptability, and continuous improvement of library users within the context of lifelong learning [10,13]. Perceived AI support for digital literacy, as evaluated by librarians, encompasses their subjective judgments regarding the impact of AI tools on information literacy, digital media comprehension, critical evaluation of online information, digital tools utilization, digital communication skills, and the promotion of awareness around online privacy and security among library users [11,39].

Numerous comparative studies scrutinizing Malaysia and Indonesia have unveiled notably congruent findings. A study by Puspitasari, Manan, and Anna [19] unveiled the sustained collaboration between library ecosystems in Malaysia and Indonesia, spanning diverse dimensions, including training programs, material borrowing procedures, and other scholarly pursuits. This collective endeavor has, to a certain degree, contributed to a shared impact, fostering the advancement and evolution of their respective libraries. Another investigation led by Rahmandita [52] delved into the scrutiny of library websites in Indonesia and Malaysia. Employing a survey methodology with data collected from respondents in both nations, the study discerned an absence of significant distinctions in students’ experiences when engaging with digital university library websites, irrespective of institutional affiliation (public or private). Adding to the scholarly discourse, the study by Rusydiyah, Zaini Tamin, and Rahman [20] centered on literacy policies across Malaysia, Indonesia, and Singapore. Their findings revealed a noteworthy commonality in the factors influencing the implementation of literacy initiatives. Notably, Singapore, Malaysia, and Indonesia all relied on specialized literacy institutions to execute and uphold their respective literacy policies. A recent study by Mutia et al. [53] compared the work performance and work design of librarians in Malaysia and Indonesia. The study found that although there are slight differences in terms of work performance, no significant difference was observed with regard to work design, especially task characteristics. These studies clearly show that there are many similarities between Malaysia and Indonesia when it comes to the library setting. Against this background, we also expect that similarities will be observed in their perspectives on AI support for learning experience, lifelong learning, and digital literacy. Based on this background, the following hypotheses are established:

**H0a:** There is no significant difference in the perception of AI support for learning experiences between Malaysia and Indonesia.

**H0b:** There is no significant difference in the perception of AI support for lifelong learning between Malaysia and Indonesia.

**H0c:** There is no significant difference in the perception of AI support for digital literacy between Malaysia and Indonesia.

### 3. Research Methodology

This study employed a survey research methodology. The data collection instrument was a questionnaire, self-developed by the researchers and later refined through pre-testing with seven faculty members (i.e., one professor, two associate professors, and four senior lecturers) and three librarians. For each variable, six perceptual measures or items were used. Each item was rated using a five-point Likert scale, where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. Respondents were requested to indicate their level of agreement or disagreement based on these anchor points. During the pre-testing exercise, these faculty members and librarians were requested to comment on the items in terms of clarity and relevance. They were also asked to provide feedback on other aspects such as layout, format, length, and language. Based on their comments and feedback, the questionnaire was revised accordingly. After completing the pre-testing exercise, the researcher proceeded with pilot testing involving 30 librarians. Their responses were analyzed using SPSS software Version 24.0 to gauge reliability, which was measured
based on Cronbach’s Alpha. The results showed that all scores for the three variables were well above 0.7, suggesting that the measurements used in the study are acceptably reliable.

The questionnaire was administered online using the SurveyMonkey system. The respondents in the study were the highest-ranking officials in the libraries. Due to the absence of a valid sampling frame, the researcher compiled a list of public libraries, specialized libraries, university and college libraries, and school libraries based on internet searches. In Malaysia, 320 libraries were identified, while in Indonesia, 400 libraries were identified. However, many of these libraries did not provide the email addresses of their top officials, and those provided were often incorrect or inaccessible. Reminder emails were sent two weeks after the initial invitation email, and another reminder was sent in the third week to these targeted respondents. Despite these efforts over one month, 71 usable responses were collected from Malaysia (a 22.2% response rate), and 96 usable responses were collected from Indonesia (a 24% response rate). Upon closer examination, 59 responses from Malaysia and 85 responses from Indonesia were found to be unusable. These response rates are considered acceptable, especially in the context of organizational research, where achieving high response rates can be challenging. For instance, Sivo et al. [54] noted that in some published IS research, response rates can fall below 10%. Furthermore, other studies such as [55] (N = 30), [56] (N = 14), and [57] (N = 50) have also reported small sample sizes in their analyses, indicating that the sample size in this study is consistent with or even larger than those used in other studies in the field.

Based on the usable collected responses, statistical data analysis was performed using SPSS Version 24.0. Frequency analysis was executed for the demographic information, while for the items measuring the three variables, reliability analysis and descriptive analysis involving mean and standard deviation were performed. To test the three formulated hypotheses, an independent samples t-test was conducted.

4. Findings

Table 1 presents a thorough summary of the demographic characteristics of the individuals involved in the study. A total of 59 respondents from Malaysia and 85 respondents from Indonesia, representing libraries in their respective countries, actively engaged in the research. In Malaysia, there was a significant predominance of males, making up 52.5% of the respondents. Conversely, in Indonesia, females were the majority, accounting for 72.9%. Age-wise, most respondents from both Malaysia and Indonesia fell within the 40–49 age range. Further analysis of occupational roles indicated that heads of departments were predominant among Malaysian respondents, whereas senior librarians constituted the majority in Indonesia. In terms of library size, 66.1% of Malaysian respondents indicated that their libraries had a staff size exceeding 50, contrasting with Indonesia, where the majority reported a smaller scale, with 47.1% having less than 10 staff members.

<table>
<thead>
<tr>
<th>Table 1. Demographic profiles of respondents.</th>
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<tbody>
<tr>
<td>Malaysia (Total Respondent = 59) Indonesia (Total Respondent = 85)</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Age</td>
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<tr>
<td>20–29 years</td>
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<tr>
<td>30–39 years</td>
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<tr>
<td>40–49 years</td>
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<tr>
<td>50–59 years</td>
</tr>
<tr>
<td>60–69 years</td>
</tr>
<tr>
<td>Position</td>
</tr>
<tr>
<td>Chief Librarian</td>
</tr>
<tr>
<td>Senior Librarian</td>
</tr>
</tbody>
</table>
Table 1. Cont.

<table>
<thead>
<tr>
<th>Position</th>
<th>Malaysia (Total Respondent = 59)</th>
<th>Indonesia (Total Respondent = 85)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Head of Unit/Department</td>
<td>23</td>
<td>39.0</td>
</tr>
<tr>
<td>Others</td>
<td>18</td>
<td>30.5</td>
</tr>
<tr>
<td>Small (fewer than 10 staff members)</td>
<td>14</td>
<td>23.7</td>
</tr>
<tr>
<td>Medium (10–50 staff members)</td>
<td>6</td>
<td>10.2</td>
</tr>
<tr>
<td>Large (more than 50 staff members)</td>
<td>39</td>
<td>66.1</td>
</tr>
</tbody>
</table>

The findings reveal favorable mean scores for various aspects of AI support in learning experiences (Table 2). Librarians perceive that AI tools provide significant backing for personalized learning experiences, with a mean score of 3.86 (Malaysia) and 3.92 (Indonesia), indicating a positive impact on tailoring education to individual needs. AI is also seen to enhance patrons’ engagement with learning materials (mean score: 3.81 for Malaysia and 3.94 for Indonesia) and improve their understanding of concepts through AI-driven feedback mechanisms (mean score: 3.76 for Malaysia and 3.85 for Indonesia). The facilitation of timely and relevant content delivery to support patrons’ learning goals also garnered positive feedback, with a mean score of 3.78 and 3.91 for Malaysia and Indonesia, respectively. AI’s role in enhancing the accessibility of learning resources for patrons with diverse needs received a commendable mean score of 3.83 and 3.91 for Malaysia and Indonesia, respectively. Moreover, librarians perceive that AI tools contribute to fostering a sense of autonomy and self-directed learning among patrons, as indicated by a mean score of 3.76 and 3.82 for Malaysia and Indonesia, respectively. The overall mean score of 3.80 (Malaysia) and 3.89 (Indonesia) suggests a generally positive assessment of AI’s impact on learning experiences, with specific strengths in personalization, engagement, accessibility, and autonomy. Upon further analysis, an independent samples t-test yielded non-significant results ($t(142) = -0.793, p = 0.429$). This leads to the acceptance of the null hypothesis ($H_0$), suggesting that there is no significant disparity in the perception of AI support for learning experiences between Malaysia and Indonesia.

Table 2. Descriptive analysis for learning experience.

<table>
<thead>
<tr>
<th>Learning Experience (Cronbach $\alpha = 0.96$)</th>
<th>Malaysia</th>
<th>Indonesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Std Deviation</td>
<td>Mean</td>
</tr>
<tr>
<td>AI tools support personalized learning experiences for patrons</td>
<td>3.86</td>
<td>0.86</td>
</tr>
<tr>
<td>AI tools enhance patrons’ ability to engage deeply with the learning materials</td>
<td>3.81</td>
<td>0.89</td>
</tr>
<tr>
<td>AI-driven feedback mechanisms improve patrons’ understanding of learning concepts</td>
<td>3.76</td>
<td>0.95</td>
</tr>
<tr>
<td>AI tools facilitate timely and relevant content delivery to support patrons’ learning goals</td>
<td>3.78</td>
<td>0.93</td>
</tr>
<tr>
<td>AI enhances the accessibility of learning resources for patrons with diverse needs</td>
<td>3.83</td>
<td>0.87</td>
</tr>
<tr>
<td>AI tools foster a sense of autonomy and self-directed learning among patrons</td>
<td>3.76</td>
<td>0.93</td>
</tr>
<tr>
<td>Overall</td>
<td>3.80</td>
<td>0.91</td>
</tr>
</tbody>
</table>
The findings demonstrate positive perceptions from librarians regarding the impact of AI tools on lifelong learning in both Malaysia and Indonesia (Table 3). AI tools are perceived to significantly boost patrons’ motivation for engaging in lifelong learning, with mean scores of 3.86 in Malaysia and 3.91 in Indonesia. Librarians also believe that AI empowers patrons to effectively self-direct their learning journeys, as reflected in mean scores of 3.89 in Malaysia and 3.88 in Indonesia. AI tools are seen as effective in helping patrons discover and explore new areas of interest, with mean scores of 3.97 in Malaysia and 3.95 in Indonesia. While fostering a sense of community and collaboration among patrons yielded a slightly lower mean score in Malaysia (3.66), librarians in Indonesia perceived a stronger impact (3.76). Both countries indicated positive perceptions that AI tools continuously adapt to patrons’ evolving learning needs over time, with mean scores of 3.89 in Malaysia and 3.96 in Indonesia. Finally, in terms of contributing to the continuous improvement of patrons’ skills and knowledge, Malaysia and Indonesia reported mean scores of 3.79 and 3.95, respectively. The overall mean scores for lifelong learning are 3.84 in Malaysia and 3.90 in Indonesia, affirming a generally favorable view of AI tools in supporting patrons’ lifelong learning journeys. The analysis of an independent samples t-test revealed that there is no statistically significant difference between the Malaysian and Indonesian groups (t(142) = -0.457, p = 0.325), indicating that there is no significant difference in the perception of AI support for lifelong learning between Malaysia and Indonesia. To this effect, the null hypothesis (H0b) is retained.

Table 3. Descriptive analysis for lifelong learning.

<table>
<thead>
<tr>
<th>Lifelong Learning (Cronbach α = 0.95)</th>
<th>Malaysia</th>
<th>Indonesia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std Deviation</td>
</tr>
<tr>
<td>AI tools boost patrons’ motivation to engage in lifelong learning</td>
<td>3.86</td>
<td>0.89</td>
</tr>
<tr>
<td>AI tools empower patrons to self-direct their learning journeys effectively</td>
<td>3.89</td>
<td>0.90</td>
</tr>
<tr>
<td>AI tools help patrons discover and explore new areas of interest</td>
<td>3.97</td>
<td>0.85</td>
</tr>
<tr>
<td>AI tools foster a sense of community and collaboration among patrons</td>
<td>3.66</td>
<td>0.99</td>
</tr>
<tr>
<td>AI tools continuously adapt to patrons’ evolving learning needs over time</td>
<td>3.89</td>
<td>0.92</td>
</tr>
<tr>
<td>AI tools contribute to the continuous improvement of patrons’ skills and knowledge</td>
<td>3.79</td>
<td>0.92</td>
</tr>
<tr>
<td>Overall</td>
<td>3.84</td>
<td>0.92</td>
</tr>
</tbody>
</table>

The findings indicate positive perceptions among librarians regarding the impact of AI tools on digital literacy, as assessed through a Likert scale, in both Malaysia and Indonesia (Table 4). AI tools are perceived to effectively enhance patrons’ information literacy skills, with mean scores of 3.86 in Malaysia and 3.92 in Indonesia. Librarians in both countries also believe that AI tools successfully improve patrons’ comprehension of digital media content, as reflected by mean scores of 3.86 in Malaysia and 3.98 in Indonesia. The results suggest that AI tools are essential in assisting users to assess and determine the reliability of online information. The statistics reveal that Malaysia has a mean score of 3.61, whereas Indonesia has a slightly higher mean score of 3.76. AI is also acknowledged for greatly improving customers’ capacity to explore and utilize digital products and platforms. The overall mean scores for digital literacy on the Likert scale are 3.79 in Malaysia and 3.92 in Indonesia, signifying a favorable perception of AI’s impact on various aspects of patrons’ digital literacy skills in library contexts. Consequently, an independent samples t-test was executed to test the third hypothesis and the results indicated that there is no statistically significant difference between the Malaysian and Indonesian groups (t(142) = -1.15, p = 0.25). Given this result, H0c is upheld.
Table 4. Descriptive analysis for digital literacy.

<table>
<thead>
<tr>
<th>Digital Literacy</th>
<th>Malaysia</th>
<th>Indonesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI tools enhance patrons’ information literacy skills effectively</td>
<td>3.86</td>
<td>3.92</td>
</tr>
<tr>
<td>AI tools improve patrons’ comprehension of digital media content</td>
<td>3.86</td>
<td>3.98</td>
</tr>
<tr>
<td>AI tools help patrons critically evaluate and discern the reliability of online information</td>
<td>3.61</td>
<td>3.76</td>
</tr>
<tr>
<td>AI enhances patrons’ ability to navigate and utilize digital tools and platforms</td>
<td>3.92</td>
<td>4.00</td>
</tr>
<tr>
<td>AI tools contribute to patrons’ digital communication skills</td>
<td>3.85</td>
<td>3.92</td>
</tr>
<tr>
<td>AI tools assist patrons in developing awareness of online privacy and security</td>
<td>3.69</td>
<td>3.91</td>
</tr>
<tr>
<td>Overall</td>
<td>3.79</td>
<td>3.92</td>
</tr>
</tbody>
</table>

5. Discussion
5.1. Discussion Related to RO1

The first objective of the study is to measure librarian perspectives on the support provided by AI in enhancing learning experiences, fostering lifelong learning, and advancing digital literacy initiatives. Six items have been developed to assess the perceived support for each of these variables. The results have shown that almost all items were rated well above 3.0 (i.e., the middle value) suggesting that the librarians have given favorable and positive assessments with regard to the use of AI in supporting initiatives of activities related to learning experiences, lifelong learning, and digital literacy in the libraries.

In terms of learning experience, the study respondents clearly indicated that AI tools support personalized learning experiences, enhance engagement with materials, and improve understanding through feedback mechanisms. They also indicated that AI facilitates timely content delivery, enhances resource accessibility for diverse needs, and fosters autonomy and self-directed learning among patrons. These findings provide further evidence to support claims that AI is useful and beneficial for these reasons [58–60]. Individual learning journeys differ and are influenced by various factors such as individual traits, skills and capabilities, needs and preferences, as well as the surrounding environment, including people, technology, and policy. The library has always provided and will continue to provide the space and resources for learning, and with libraries equipped with AI, the learning experience of users or patrons will be better served.

Within the context of lifelong learning, the findings of this study are almost consistent with previous works [61–64]. Librarians perceive that AI tools boost patrons’ motivation for lifelong learning, empowering them to self-direct their learning journeys and explore new areas of interest. They also believe that AI could foster a sense of community, adapt to evolving needs, and contribute to the continuous improvement of patrons’ skills and knowledge. Given that previous studies [61–64] were either opinionative papers or conducted outside the context of libraries, our findings further strengthen and provide empirical evidence. Librarians, whose work revolves around servicing library users for their information needs, might have a better perspective in understanding user needs and demands. They are in a better position to help users choose, use, or even train them on how to capitalize on AI for their lifelong learning journey.

Regarding the perceived support of digital literacy, the findings are comparable to those for the learning experience and lifelong learning. The respondents assessed favorably on all items measuring this variable. Generally, they agreed that AI tools enhance patrons’ information literacy skills, improve comprehension of digital media content, and help critically evaluate the reliability of online information. The respondents also agreed that AI
improves navigation and utilization of digital tools, contributes to digital communication skills, and assists in developing awareness of online privacy and security. Our findings further strengthen previous studies [64,65]. Unlike these studies that focused on AI in an academic setting, our study explored it from the library perspective. Despite the differences in the study setting, the findings are almost congruent and complementary. AI, being digital, is closely related to digital literacy. Practically, those who are digitally literate are the ones who would use AI optimally. However, as shown in this study, AI is very helpful and useful in helping users improve and enhance their digital literacy skills. One of the core functions of libraries is improving literacy, including digital literacy, and as indicated by the respondents, this function can be greatly enhanced through the help of AI.

5.2. Discussion Related to RO2

The second objective of the study is to compare the perspectives of librarians in Malaysia and Indonesia. Three hypotheses have been established in connection with this objective. The results of the independent samples t-test analysis have shown that there are no significant differences between the perspectives of libraries in Malaysia and Indonesia regarding AI support for learning experience, lifelong learning, and digital literacy. As mentioned in previous sections, studies in the context of libraries involving these two countries have found almost similar and congruent results [19,20,52,53]. The findings are quite predictable, given that Malaysia and Indonesia have many similarities. Both countries have experienced rapid technological advancement and have made significant efforts to integrate technology into various sectors, including education and libraries. Additionally, the cultural similarities between Malaysia and Indonesia, such as shared values, traditions, and historical backgrounds, may contribute to the congruent perspectives of librarians in both countries regarding AI support for learning experience, lifelong learning, and digital literacy. Furthermore, the economic similarities, including comparable levels of development and infrastructure, may also play a role in the consistency of perspectives on the benefits of AI in libraries.

6. Conclusions

In this era of AI, various professions and organizations, including librarians and libraries, will be affected directly or indirectly. In line with the objectives of the study, the use of AI is seen to have a positive impact on enhancing the learning experience, lifelong learning, and digital literacy in libraries. Libraries in Malaysia and Indonesia have an almost congruent assessment of these three aspects. Given these findings, several implications can be observed. From an empirical perspective, this study provides evidence regarding the perceived support of AI for libraries. As previously mentioned, much of the published literature on AI benefits and usefulness consists of authors’ opinions and viewpoints, lacking empirical support. From a methodological perspective, this study has developed scales for measuring perceived AI support for the learning experience, lifelong learning, and digital literacy in libraries. These three variables, along with the scales, can be used by researchers to study other aspects related to AI adoption or implementation. From a practical perspective, the findings of this exploratory study highlight the importance of investing in AI technologies and should be useful to decision-makers in determining the types of AI they should invest in for their libraries. Additionally, the study underscores the need for continuous evaluation and adaptation of AI tools to ensure they meet the evolving needs of library patrons.

Similar to other empirical studies, this study has several limitations that are worth mentioning. Firstly, the study is dependent on perceptual measures, which inevitably contribute a subjective element to the assessment. Librarians’ perceptions can be shaped by personal experiences and viewpoints, which may potentially result in variations in responses. In addition, the study is hindered by the relatively small sample size, consisting of only 59 participants from Malaysia and 85 participants from Indonesia. The limited sample size may not adequately represent the various perspectives within the librarian
community of each country, thereby restricting the applicability of the findings. Increasing the size and variety of the sample could strengthen the study's reliability and yield a more thorough comprehension of librarians' perspectives on AI support for promoting the learning experience, lifelong learning, and digital literacy.

**Author Contributions:** Conceptualization, M.N.M.; Methodology, F.M., T.S., R.T.A. and H.P.Y.; Data Collection, T.S., R.T.A. and H.P.Y.; Data Analysis, M.N.M., Writing, M.N.M., Writing Review, T.S., R.T.A. and H.P.Y.; Formatting, S.M.S.; Logistics, M.F.B. All authors have read and agreed to the published version of the manuscript.

**Funding:** This project received funding from Kementerian Pendidikan, Kebudayaan, Riset dan Teknologi, Universitas Airlangga, Lembaga Penelitian dan Pengabdian Masyarakat, with registration of 2103/UN3.LPPM/PT.01.02/2023. We express sincere gratitude to our respected benefactor, as well as to all individuals who have made direct or indirect contributions to our research.

**Data Availability Statement:** Data will be available upon request to the corresponding author.

**Acknowledgments:** We would like to express our gratitude to the expert evaluators, participants, and the Research Management Centre (RMC) of Universiti Teknologi MARA, Malaysia, for their significant support in facilitating and enhancing the development of this study.

**Conflicts of Interest:** The authors declare no conflicts of interest.

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