ADOPTION OF E-LIBRARIES AND E-TEXTBOOKS AMONG ASIAN COUNTRIES: A COMPARATIVE ANALYSIS

ABSTRACT

This study examines the adoption of e-libraries and e-textbooks in Myanmar's higher education system, comparing it with Singapore and Malaysia. It identifies key barriers in Myanmar, including inadequate infrastructure, high costs, cultural resistance, and limited policy support. Data from 310 participants, including students and educators, were analyzed within a framework of these factors. In contrast, Singapore and Malaysia have successfully implemented policies, infrastructure development, and digital literacy training, leading to higher adoption rates. The study offers recommendations for Myanmar, emphasizing strategic investments, policy creation, and capacity-building to improve digital learning and access to quality education.

Keywords: E-libraries, E-textbooks, Digital Learning, Myanmar, Singapore, Malaysia

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1. INTRODUCTION

The integration of digital learning tools, such as e-libraries and e-textbooks, has transformed education globally by enhancing accessibility, reducing reliance on physical resources, and offering personalized learning experiences. While countries like Singapore and Malaysia have successfully adopted these tools through robust infrastructure, clear policies, and strategic investments in education technology, Myanmar's progress has been slower due to challenges like inadequate infrastructure, financial constraints, and cultural resistance. Understanding the successful strategies of Singapore and Malaysia provides valuable insights for advancing digital education in Myanmar.

Globally, the transition from traditional to digital learning environments has been accelerated by advancements in information and communication technology (ICT). E-libraries provide users with access to a vast array of academic resources, including journals, books, and research papers, from any location with internet connectivity. Similarly, e-textbooks, often enriched with multimedia content, enable interactive and dynamic learning experiences. In many developed and developing countries, these tools are integral to educational institutions [1].

In Myanmar, however, the digital education journey has been slow, primarily due to systemic barriers. Limited internet penetration, particularly in rural areas, remains a significant hurdle. Additionally, the financial burden of acquiring digital devices and

maintaining digital platforms is a challenge for both institutions and individuals. Despite these issues, there is growing recognition of the potential benefits of digital learning in addressing educational disparities and improving learning outcomes. This study explores these dynamics, focusing on how Myanmar can leverage insights from Singapore and Malaysia to enhance its digital education strategies.

1.2 Objectives

The primary objective of this study is to examine the adoption of e-libraries and e-textbooks in Myanmar's higher education system and compare it with the progress made in Singapore and Malaysia. Specific objectives include:

1. To analyze the current state of e-library and e-textbook adoption in Myanmar.
2. To identify key barriers to the integration of digital learning tools in Myanmar's education sector.
3. To explore successful strategies implemented in Singapore and Malaysia for digital education.
4. To provide actionable recommendations to enhance digital learning adoption in Myanmar.

1.3 Scope and Justification

This study focuses on the adoption of e-libraries and e-textbooks within higher education institutions in Myanmar, comparing these developments with Singapore and Malaysia. The analysis considers various influencing factors, including financial, infrastructural, cultural, and policy dimensions. By examining these variables, the study provides a comprehensive understanding of the challenges and opportunities in Myanmar's digital education landscape.

The justification for this research lies in the critical need to modernize Myanmar's education system. As digital technologies continue to reshape global education, it is imperative for Myanmar to adopt these tools to improve educational access, equity, and quality. Learning from the experiences of regional counterparts like Singapore and Malaysia offers valuable insights into how Myanmar can overcome its unique challenges. This study aims to contribute to the broader discourse on digital transformation in education by offering evidence-based strategies tailored to Myanmar's context.

1.4 Limitation

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This study provides valuable insights into the adoption of e-libraries and e-textbooks in Myanmar, though some limitations exist. It focuses on higher education, which may not fully reflect challenges in primary and secondary education. While the sample of 310 participants is significant, it may not capture the full diversity of experiences, especially in rural areas. The comparative analysis with Singapore and Malaysia is based on secondary data, which may lack contextual nuances. Additionally, the fast-evolving nature of digital technologies and policies may make some findings time-sensitive. Despite these limitations, the study offers a strong foundation for further research and policy recommendations in Myanmar's digital education landscape.

2. LITERATURE REVIEW

The adoption of e-libraries and e-textbooks in education involves a complex interplay of factors, including financial, infrastructural, cultural, and policy-related challenges. These digital resources hold great promise for enhancing educational accessibility, flexibility, and cost-efficiency, but their successful integration into educational systems requires favorable conditions and targeted interventions. This section explores the theoretical framework underpinning this study and provides a comparative analysis of adoption efforts in Singapore, Malaysia, and Myanmar.

2.1 Theoretical Framework

This study adopts a conceptual framework comprising five independent variables that influence the adoption of e-libraries and e-textbooks. These variables reflect the multifaceted nature of digital adoption in education and highlight both the barriers and enablers present within various educational contexts.

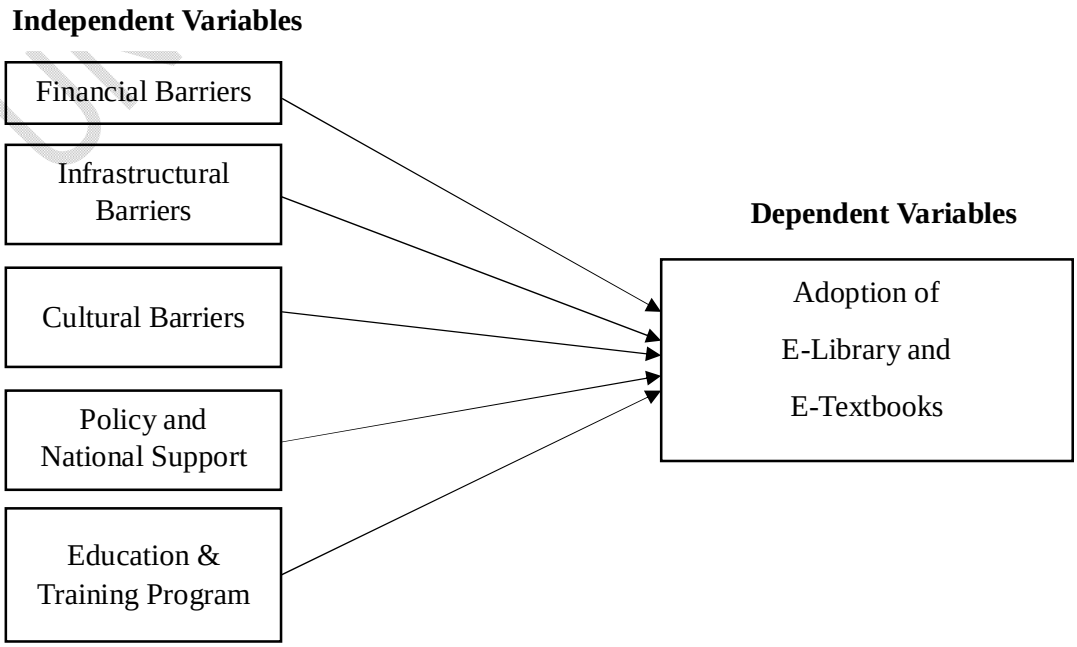

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Figure (1) Conceptual Framework of the Study

2.1.1Financial Barriers

Financial constraints remain one of the most significant barriers to the adoption of digital learning tools in education systems worldwide. In developing countries, including Myanmar, the costs associated with acquiring digital devices, securing reliable internet connectivity, and purchasing digital content are often prohibitive. As noted by Oye et al. (2011), the high cost of digital tools, such as laptops, tablets, and smartphones, limits access to e-libraries and e-textbooks, particularly for students and educational institutions in economically disadvantaged regions [2]. Furthermore, recurring costs, such as internet subscriptions and the procurement of digital resources or licenses, place an additional financial burden on both students and educational organizations [3]. Addressing these financial barriers necessitates targeted financial interventions, such as government subsidies, public-private partnerships, and funding models that make digital learning tools more affordable and accessible [4].

2.1.2 Infrastructural Barriers

Reliable technological infrastructure is crucial for the successful adoption of e-libraries and e-textbooks. Infrastructural elements include not only hardware (e.g., computers, servers) but also software, network connectivity, and electricity [5]. In countries such as Myanmar, where inadequate infrastructure, especially in rural areas, poses significant challenges, students and educators often face difficulties in accessing digital resources. Issues such as frequent power outages and slow or unreliable internet connections exacerbate these infrastructural deficits [6]. In contrast, countries like Singapore, with robust technological ecosystems, experience fewer obstacles in integrating digital learning tools into the curriculum [4]. This comparison underscores the importance of making infrastructural investments to facilitate digital learning adoption [7].

2.1.3 Cultural Barriers

Cultural attitudes towards technology and education play a pivotal role in the acceptance and integration of digital tools. In Myanmar, for instance, there is a strong cultural preference for traditional teaching methods, which often leads to resistance to new technologies. Many educators and students are accustomed to using printed textbooks and face-to-face instruction, leading to skepticism regarding the effectiveness of e-libraries and e-

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textbooks. Cultural barriers also include concerns about the reliability of digital resources, as well as language issues and the availability of locally relevant digital content [8]. Overcoming such resistance requires a concerted effort to promote awareness and demonstrate the benefits of digital learning tools, as well as the development of culturally appropriate content. Pilot programs and training workshops are essential in fostering positive attitudes towards e-learning technologies [9].

2.1.4 Policy and National Support

Government policies and national support frameworks are instrumental in driving the adoption of digital learning tools. Effective policies set clear objectives for the integration of technology into the education system and allocate resources to support these efforts. In Singapore, for example, the government's Smart Nation initiative has been central to integrating technology into all sectors, including education, through strategic planning and significant investments in digital literacy and infrastructure [10]. In contrast, Myanmar's lack of cohesive national policies on digital education has resulted in fragmented efforts and slow adoption. Strengthening policy frameworks and ensuring that resources are consistently allocated and distributed can significantly improve digital education outcomes [11].

2.1.5 Education and Training Programs

The successful adoption of e-libraries and e-textbooks depends on the digital literacy of both educators and students. Without the necessary skills to navigate these digital resources, their potential remains underutilized [12]. Training programs aimed at building digital competence are essential to equip teachers and students with the tools and knowledge to use e-libraries and e-textbooks effectively [13]. Malaysia's experience demonstrates the importance of such initiatives in fostering digital literacy, with government-backed programs targeting teacher professional development and student digital competence. For Myanmar, prioritizing digital literacy through targeted education and training programs will be crucial in overcoming barriers to adoption and ensuring that digital learning tools are used to their full potential [14].

2.2 Comparative Context

The adoption of e-libraries and e-textbooks varies considerably across countries, influenced by differing levels of technological readiness, policy support, and cultural

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acceptance. This section provides a comparative perspective of the digital education landscapes in Singapore, Malaysia, and Myanmar.

2.2.1 Singapore

Singapore is a global leader in the integration of digital technology into education. The government's Smart Nation initiative has played a key role in advancing digital education by prioritizing digital literacy, infrastructure development, and technology integration at all educational levels [4]. The country's robust technological infrastructure, including widespread internet connectivity and the availability of modern digital tools in schools, has made the adoption of e-libraries and e-textbooks relatively seamless. Additionally, the Ministry of Education (MOE) has implemented comprehensive support systems, including funding for digital content and professional development programs for educators. As a result, Singapore has achieved high adoption rates of digital learning tools, setting an example for other countries to follow.

2.2.2 Malaysia

Malaysia has made significant strides in digital education, adopting a balanced approach that addresses both urban and rural disparities. The Malaysia Education Blueprint 2013-2025 emphasizes the role of technology in enhancing educational access and quality, with a focus on improving digital literacy and bridging the digital divide. The government has invested heavily in ICT infrastructure, ensuring that schools in remote areas have access to digital tools and internet connectivity. Training programs for educators and students have been a key component of this strategy, equipping teachers with the necessary skills to integrate digital resources into their teaching [4]. Malaysia's experience demonstrates the importance of an equitable and holistic approach to digital adoption, ensuring that no group is left behind in the transition to digital learning.

2.2.3 Myanmar

In contrast to Singapore and Malaysia, Myanmar's progress in digital education has been relatively slow, due to several systemic challenges. Limited access to reliable internet, especially in rural regions, and frequent power outages constrain the use of e-libraries and e-textbooks. Financial barriers further exacerbate the issue, with many educational institutions unable to afford the necessary devices and resources. The absence of a national policy on digital education has resulted in fragmented and inconsistent efforts, with limited

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coordination between the government and educational institutions. Additionally, cultural resistance to digital learning tools remains a significant challenge, with traditional methods of instruction still holding strong appeal. However, as digital literacy gains importance globally, Myanmar has an opportunity to learn from its regional counterparts, adapting successful strategies to its own context.

3. RESEARCH METHODOLOGY

This study adopts a mixed-methods research design, combining both quantitative and qualitative approaches to provide a comprehensive analysis of the factors influencing the adoption of e-libraries and e-textbooks in Myanmar's higher education system. The integration of numerical data and rich, contextual insights offers a deeper understanding of the barriers, opportunities, and outcomes associated with digital learning tools.

3.1 Research Design

The study follows a mixed-methods research approach, which allows for a holistic examination of the factors affecting the adoption of e-libraries and e-textbooks. The mixed-methods design enables the integration of both quantitative and qualitative data, providing a more complete picture of the issue at hand.

The quantitative component involves the collection of survey data from a sample of 310 participants, including students and teachers from various higher education institutions across Myanmar. This approach is designed to measure participants' perceptions, attitudes, and experiences regarding the ease of use, access, and impact of e-libraries and e-textbooks on learning outcomes. A structured survey instrument ensures consistency and reliability in capturing data on these key variables, allowing for precise measurement and statistical analysis.

Complementing the quantitative data, the qualitative component draws upon secondary data from government reports, policy documents, and case studies from countries like Singapore and Malaysia. These countries were selected due to their advanced digital infrastructure and successful experiences in integrating e-learning technologies in higher education. The qualitative data is used to identify best practices, explore contextual challenges, and extract policy insights that can inform the implementation of e-libraries and e-textbooks in Myanmar.

3.2 Data Collection

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The data collection process was designed to comprehensively capture both quantitativeand qualitative data, enabling a well-rounded analysis of the research problem.

A structured questionnaire was developed to gather quantitative data. The survey was distributed to 310 participants, including students and teachers from a variety of higher education institutions across Myanmar. The questionnaire focuses on key aspects of digital tool adoption, such as ease of use, access to digital resources, and the perceived impact of e-libraries and e-textbooks on learning outcomes. Likert-scale questions were employed to measure participants' attitudes and perceptions toward these tools, and open-ended questions were included to capture richer qualitative insights.

In addition to the primary survey data, secondary data was gathered from existing reports and case studies on the adoption of digital educational tools in Singapore and Malaysia. These countries were chosen for their proven success in the deployment of e-learning platforms. The secondary data was obtained from governmental publications, academic studies, and relevant case studies. This information provided insights into barriers to adoption, policy frameworks, and institutional support mechanisms, which were analyzed to determine their applicability to Myanmar's higher education context.

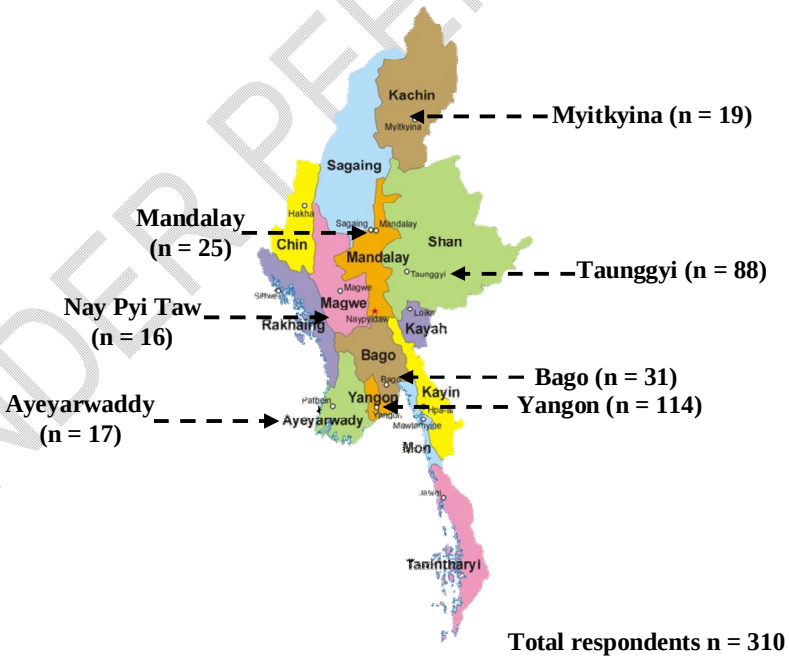

Figure 2: Survey Area of Current Study in Different Region and State of Myanmar

3.3 Data Analysis

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The data analysis process employs a two-tiered approach: quantitative data was analyzed using statistical methods, and qualitative data was analyzed thematically to extract meaningful insights.

The survey data collected was subjected to both descriptive and inferential statistical analysis. Descriptive statistics, such as frequencies, means, and standard deviations, were used to summarize participants' responses. Inferential statistics, including correlation and regression analyses, were performed to examine relationships between key variables, such as ease of use, access to digital tools, and the perceived impact on learning outcomes. This analysis helps identify patterns, trends, and potential correlations that contribute to understanding the factors influencing the adoption of digital tools in higher education.

The qualitative data collected from secondary sources, such as case studies and government reports, was analyzed using thematic analysis. Thematic analysis involves identifying recurring themes, patterns, and insights across the various case studies from Singapore and Malaysia. This approach allows for the comparison of these countries' experiences with the current situation in Myanmar, yielding valuable insights into barriers, institutional support, and policy frameworks. These themes were extracted and analyzed to inform recommendations for enhancing the adoption of digital tools in Myanmar's higher education system.

By triangulating both quantitative and qualitative data, this study ensures a comprehensive and robust analysis of the factors influencing the adoption of digital tools in Myanmar's higher education sector. The integration of different data types enhances the credibility and depth of the findings, allowing for a more nuanced understanding of the barriers and opportunities related to e-library and e-textbook adoption.

4. RESULTS AND DISCUSSION

This section presents a comprehensive analysis of the study's findings, aligned with the research objectives, and discusses the key results in the context of Myanmar's adoption of e-libraries and e-textbooks. The discussion is enriched by comparing Myanmar's situation with that of Singapore and Malaysia, two countries that have made notable progress in digital education. The analysis delves into the current state of adoption, identifies the critical barriers hindering progress, reviews successful strategies implemented by Singapore and Malaysia, and concludes with actionable recommendations tailored for Myanmar's educational landscape.

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4.1 Current State of E-Library and E-Textbook Adoption in Myanmar

The findings from the survey conducted among students and educators across various higher education institutions in Myanmar suggest that the adoption of digital tools, such as e-libraries and e-textbooks, remains in its infancy. The results underscore the broader digital divide that characterizes Myanmar's education sector.

4.1.1 E-Library Adoption:

The survey revealed that only 35% of students use e-libraries on a regular basis. This adoption rate is low compared to Singapore and Malaysia, where e-libraries have been widely integrated into academic life. In Singapore, nearly 90% of students and educators have access to and regularly use e-libraries, benefiting from robust digital infrastructure and government-backed initiatives. Similarly, in Malaysia, the adoption rate stands at 65%, which, while better than Myanmar’s, still represents a significant gap.

Several factors contribute to Myanmar's lower adoption rate. Despite some availability of e-libraries, many students report difficulty in accessing these platforms consistently. One of the main reasons is the poor internet connectivity, particularly in rural and remote areas. In urban areas like Yangon, internet speeds and availability are better, but access remains unreliable for many students and educators in less developed regions.

The findings suggest that while Myanmar’s educational institutions have made attempts to digitize resources, the lack of reliable digital infrastructure and support systems has hindered full-scale adoption. The situation in Singapore, where seamless connectivity and infrastructure have made e-libraries an integral part of student life, highlights the importance of solid technological foundations in achieving widespread adoption.

4.1.2 E-Textbook Adoption:

The survey showed that only 20% of students use e-textbooks regularly, a figure that starkly contrasts with the 90% adoption rate seen in Singapore, where e-textbooks have become a mainstream learning tool. In Malaysia, 65% of students regularly use e-textbooks, suggesting a significant middle ground.

The low adoption of e-textbooks in Myanmar can be attributed to several issues. First, many educators in Myanmar continue to prefer traditional printed textbooks due to a lack of familiarity with digital pedagogies. Moreover, digital content for textbooks is often scarce or expensive. While Singapore and Malaysia have established systems where e-textbook access is readily provided through academic licenses or subsidized programs, Myanmar’s

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underdeveloped digital content infrastructure remains a critical barrier. Additionally, cultural resistance to moving away from printed textbooks remains strong, particularly among more senior educators, who are less inclined to embrace the shift towards digital learning resources.

4.2 Barriers to Adoption of E-Libraries and E-Textbooks in Myanmar

The study identified several barriers to the adoption of e-libraries and e-textbooks in Myanmar. These include financial constraints, infrastructural barriers, and cultural resistance, all of which have compounded the challenges faced by students and educators.

4.2.1 Financial Constraints

The most significant barrier to digital adoption is financial. According to the survey, 72% of respondents cited the high costs of digital education tools, such as devices, internet access, and digital content, as major obstacles. Many students and educators report that they cannot afford the necessary technology to access digital resources. Government teachers, who make up the majority of participants, earn less than 300,000 kyats (approximately USD 150) per month, which limits their ability to purchase laptops or tablets and maintain reliable internet access. This financial gap is more pronounced in rural areas, where both the cost of devices and the lack of digital infrastructure make access to e-libraries and e-textbooks particularly difficult.

In Malaysia, the government has made significant strides in addressing financial barriers to digital access for students, particularly in underserved areas. The ***Cerdik initiative*** is one such effort that has provided over 150,000 digital devices to eligible students across the country. This initiative aims to bridge the digital divide, especially for students in rural and disadvantaged communities, by offering laptops and tablets to enhance learning through digital tools. Moreover, Malaysia's *Digital Education Policy* (2023-2030) emphasizes the integration of digital technology into education, further fostering digital literacy among students.

In Singapore, the government has also implemented the ***DigitalAccess@Home*** program, which subsidizes broadband services and provides laptops or tablets to lower-income households. This program ensures that students from economically disadvantaged backgrounds have the necessary tools for online learning. Eligible households can receive heavily subsidized devices and internet packages, with co-payments adjusted based on income tiers. Such initiatives have been key in ensuring that all students, regardless of their

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financial situation, have access to the resources needed to thrive in a digital learning environment.

4.2.2 Infrastructural Barriers

Myanmar faces significant challenges in infrastructure, particularly in rural areas, which hinder the adoption of digital tools for education. A recent survey revealed that approximately 68% of students and educators in Myanmar report difficulties with unreliable internet connectivity, especially in rural regions. The lack of consistent bandwidth, a limited number of devices, and unreliable power sources contribute to these issues. In many rural schools, stable electricity is still not available, further complicating efforts to use digital devices and access online learning resources.

In contrast, Singapore has made considerable strides in ensuring reliable and widespread internet access. The country boasts near-universal high-speed internet coverage, with government initiatives ensuring that students in both urban and rural areas have the digital tools and resources required for e-learning. The government's Digital Access initiatives, including providing laptops and internet subsidies to low-income households, ensure that no student is left behind due to financial constraints. These efforts are further supported by national policies like the Smart Nation initiative, which focuses on fostering digital literacy and enhancing internet accessibility nationwide.

Similarly, Malaysia has made significant improvements in internet infrastructure, particularly in urban areas. According to recent reports, the country's Jalinan Digital Negara (JENDELA) initiative aims to expand 4G internet coverage to 96% of populated areas by 2025, addressing connectivity gaps in both urban and rural regions. However, rural areas still face challenges, particularly in accessing reliable internet for educational purposes, although government programs like the Cerdik initiative are helping bridge this gap by providing digital devices to students in underserved areas.

These disparities between Myanmar and its neighbors, Singapore and Malaysia, underscore the challenges faced in rural Myanmar, where infrastructural barriers remain a key obstacle to the adoption of digital tools such as e-libraries and e-textbooks. While Singapore and Malaysia are making substantial progress, Myanmar continues to struggle with basic connectivity, preventing many students from accessing critical digital learning resources.

4.2.3 Cultural Resistance

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Cultural factors significantly hinder the adoption of digital tools in Myanmar's education system. A recent study found that over 55% of educators surveyed expressed skepticism about using e-libraries and e-textbooks, preferring traditional teaching methods. This resistance stems from various cultural factors, including a deep-rooted respect for tradition, limited digital literacy among educators and students, and a cultural preference for physical textbooks. Many educators, especially older ones, feel more comfortable with tangible books and face-to-face teaching, which they perceive as more effective. This cultural resistance, coupled with infrastructural challenges and limited access to technology, has significantly slowed the integration of digital tools into Myanmar's education system.

Singapore, on the other hand, has embraced digital technologies with enthusiasm. The government's strong emphasis on education and a culture of continuous learning has created a conducive environment for the adoption of innovative technologies. This, coupled with strong government support and stringent quality standards, has accelerated the adoption of digital tools. For example, a recent report by the Singapore Ministry of Education showed that over 90% of schools are equipped with e-libraries, providing access to a vast array of digital resources. Additionally, the government's investment in digital infrastructure and the development of user-friendly digital platforms have further facilitated the adoption of e-libraries and e-textbooks.

While Malaysia has made significant strides in integrating digital tools into its education system, cultural factors like language diversity and religious beliefs can pose challenges. For example, a recent report by the Malaysian Ministry of Education showed that only 75.4% of schools in Malaysia use ICT for education. Additionally, a survey conducted by the Malaysian Communications and Multimedia Commission found that some respondents expressed concerns about the potential negative impacts of technology on religious values, particularly regarding the spread of misinformation and the erosion of traditional values. These cultural factors can hinder the adoption of digital tools, especially in rural areas where traditional values and beliefs remain strong.

While Myanmar grapples with cultural resistance to the adoption of digital tools, Singapore and Malaysia have successfully leveraged their cultural strengths and government support to embrace digital technologies in education. To bridge the digital divide in Myanmar, policymakers and educators must address cultural barriers by promoting digital literacy, breaking down misconceptions, providing comprehensive training, and collaborating with stakeholders to create a more technologically empowered and connected society.

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4.3 Successful Strategies from Singapore and Malaysia

The experiences of Singapore and Malaysia offer valuable insights into how Myanmar can overcome the challenges and barriers hindering the adoption of e-libraries and e-textbooks. Both countries have demonstrated successful strategies in promoting digital education, emphasizing the importance of infrastructure development, teacher training, and policy support.

4.3.1 Singapore's Smart Nation Initiative

Singapore stands as a global leader in digital education. The Smart Nation initiative has been instrumental in driving the adoption of e-libraries and e-textbooks. By investing heavily in infrastructure, the government has ensured universal internet access across all educational institutions. For instance, in 2022, the National Library Board reported a 5 million increase in total visitor-ship, with a significant portion attributed to the utilization of e-resources.

Additionally, the distribution of digital devices like laptops and tablets has empowered students to access e-resources seamlessly. To complement these technological advancements, Singapore has prioritized teacher training. Educators receive extensive training in using digital tools effectively, ensuring they can seamlessly integrate these resources into their teaching practices. This comprehensive approach, combining infrastructure development, device distribution, and teacher training, has positioned digital learning as a cornerstone of Singapore's education system.

4.3.2 Malaysia's Digital Education Strategy

Malaysia has made significant strides in integrating digital tools into its education system through its Digital Education Strategy. Key strategies include providing subsidies for digital devices, implementing targeted digital literacy programs, and improving internet connectivity in rural areas. These initiatives have significantly impacted the adoption of e-textbooks and e-libraries, especially in rural areas. For instance, a recent report by the Malaysian Ministry of Education showed that the number of schools with high-speed internet access increased by 20% between 2018 and 2022.

Additionally, the government's investment in digital infrastructure has led to a significant increase in internet penetration rates, particularly in rural areas. This has made it easier for students and teachers to access e-learning resources and participate in online learning activities.

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4.3.3 Lessons for Myanmar

By analyzing the successful strategies employed by Singapore and Malaysia, Myanmar can identify key areas for improvement to accelerate the adoption of e-libraries and e-textbooks. Both countries have prioritized investment in infrastructure, teacher training, and policy support to foster a conducive environment for digital learning.

Singapore's Smart Nation initiative serves as an exemplary model for Myanmar. By investing heavily in high-speed internet infrastructure and providing digital devices to students, Singapore has ensured universal access to digital resources. Additionally, comprehensive teacher training programs have equipped educators with the skills to effectively integrate digital tools into their classrooms. This holistic approach has significantly contributed to the widespread adoption of e-libraries and e-textbooks in Singapore.

Malaysia has also made significant strides in digital education. By implementing targeted policies and initiatives, such as providing subsidies for digital devices and improving internet connectivity in rural areas, Malaysia has addressed the digital divide. Furthermore, the government's emphasis on teacher training and capacity building has empowered educators to effectively utilize digital tools.

To replicate these successes, Myanmar should prioritize a comprehensive approach to digital education. Investing in robust internet infrastructure, particularly in rural areas, is crucial to ensuring equitable access to digital resources. Additionally, comprehensive teacher training programs must be implemented to equip educators with the necessary skills to effectively integrate digital tools into their teaching practices. Promoting digital literacy among students and teachers through awareness campaigns and training programs is equally important.

Moreover, supportive policies and regulations are essential to encourage the adoption of digital resources and allocate sufficient funding for digital initiatives. Collaboration between government agencies, educational institutions, and technology providers can foster a conducive environment for the integration of e-libraries and e-textbooks. By adopting these strategies, Myanmar can overcome the challenges and accelerate the integration of digital tools into its education system, ultimately improving the quality of education and preparing students for the digital age.

5.CONCLUSION

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This study has provided a comprehensive analysis of the adoption of e-libraries and e-textbooks in Myanmar's higher education system. The findings highlight significant challenges, including financial constraints, infrastructural limitations, and cultural resistance, that hinder the widespread adoption of digital learning tools.

While Myanmar faces these hurdles, Singapore and Malaysia have demonstrated successful strategies for integrating digital technologies into their education systems. These countries have invested in infrastructure development, provided comprehensive teacher training, and implemented supportive policies to foster a conducive environment for digital learning.

To bridge the digital divide and accelerate the adoption of e-libraries and e-textbooks in Myanmar, a multi-faceted approach is necessary. Prioritizing the development of robust internet infrastructure, especially in rural areas, is crucial to ensure equitable access to digital resources. Additionally, comprehensive teacher training programs must be implemented to equip educators with the necessary skills to effectively integrate digital tools into their teaching practices. Promoting digital literacy among students and teachers through awareness campaigns and training programs is equally important.

Moreover, supportive policies and regulations are essential to encourage the adoption of digital resources and allocate sufficient funding for digital initiatives. Fostering collaboration between government agencies, educational institutions, and technology providers can create a conducive environment for the integration of e-libraries and e-textbooks. To make digital devices and internet access more affordable for students and educators, financial incentives and subsidies should be explored. Finally, promoting a culture of innovation and digital literacy, encouraging educators to embrace digital tools and pedagogical approaches, is vital for successful adoption.

By implementing these strategies, Myanmar can overcome the challenges and accelerate the integration of e-libraries and e-textbooks into its education system, ultimately improving the quality of education and preparing students for the digital age.

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6.SUGGESTIONS

A comprehensive national digital education strategy is crucial to guide the adoption of e-libraries and e-textbooks. This strategy should outline clear goals, targets, and implementation plans. Supportive policies and regulations should be established to encourage the use of digital resources and allocate sufficient funding for digital initiatives and infrastructure development.

Investing in expanding and upgrading internet infrastructure, particularly in rural areas, is essential to ensure equitable access to digital resources. Providing affordable internet access for educational institutions and students is another key factor. Additionally, reliable power supply is crucial to support the use of digital devices.

To effectively utilize digital tools, teachers need to be equipped with the necessary skills and knowledge. Comprehensive teacher training programs should be implemented to provide educators with the tools to integrate digital resources into their teaching practices. Ongoing professional development opportunities are also vital to keep teachers updated on the latest technological advancements.

Developing high-quality, locally relevant digital content, such as e-textbooks, online courses, and interactive learning materials, is essential for effective digital learning. Collaborating with content providers and publishers can help create accessible and affordable digital resources.

To ensure that all students have access to digital learning, it is crucial to provide them with digital devices and internet connectivity. Offering digital literacy training and technical support can further empower students to utilize digital resources effectively.

Fostering partnerships between government agencies, educational institutions, and technology providers can leverage resources and expertise to accelerate the adoption of digital tools. Encouraging private sector investment in digital education initiatives can also contribute to the development of innovative solutions and sustainable models.

By implementing these recommendations, Myanmar can overcome the challenges and accelerate the integration of e-libraries and e-textbooks into its education system, ultimately improving the quality of education and preparing students for the digital age.

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REFERENCES

1. Khan, Rahat (2021). Important of Digital Library in Education. *International Journal of Research in Library Science,* 7(2), 102-117
2. Oye, M. A., Salleh, K., &Iahad, N. M. (2011). The impact of e-learning on students' performance in tertiary institutions. *International Journal of Computer Networks and Wireless Communications*, 2(2), 123-130.
3. Ally, M. (2008). *Foundations of educational theory for online learning*. Athabasca University Press.
4. Cheung, A. C. K., & Slavin, R. E. (2013). The effectiveness of educational technology applications for enhancing mathematics achievement in K-12 classrooms: A meta-analysis. *Educational Psychology Review*, 25(4), 459-478.

5. Bingimlas, K. A. (2009). Barriers to the successful integration of ICT in teaching and learning environments: A review of the literature. *European Journal of Scientific Research*, 37(2), 239-250.
6. Kirkwood, A., & Price, L. (2014). E-learning: The professional's perspective. *Learning, Media and Technology*, 39(3), 1-19.
7. Hepp, P., Hinostroza, E., Laval, E., & Rehbein, L. (2004). *Information and communication technologies in education: A curriculum for development* (Education and Technology Series). World Bank.
8. Czerniewicz, L., & Brown, C. (2009). A study of the role of ICT in promoting learning and development in South Africa. *International Journal of Education and Development using Information and Communication Technology*, 5(1), 10-24.
9. Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017-1054.
10. Rosas, R., & Schneider, S. (2010). The impact of e-textbooks on student learning: A meta-analysis. *Computers & Education*, 54(1), 24-34.
11. Htun, M., & Win, A. (2022). The State of Digital Education in Myanmar: Challenges and Opportunities. *Journal of Southeast Asian Studies*, 53(2), 250-275.
12. Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *The Internet and Higher Education*, 19, 18-26.
13. Kirkwood, A., & Price, L. (2014). E-learning: The professional's perspective. *Learning, Media and Technology*, 39(3), 1-19.
14. Kukulska-Hulme, A., & Lees, E. (2016). E-textbooks: Opportunities and challenges. *Journal of Computer Assisted Learning*, 32(2), 117-128.

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