Implementation of School Digital Libraries in Indonesia: A Systematic Review

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Abstract

The purpose of this research is to identify the implementation of digital school libraries in Indonesia along with the obstacles in their implementation. This study used a systematic review method with planning, execution, and reporting stages. The databases used in this research were Google Scholar and Portal Garuda with a publication limit of the last 10 years (2013-2023). The search yielded a total of 169 articles. After the elimination process, a total of 9 articles were analyzed in this study. The results show that the majority of library implementations in Indonesia use web-based platforms with digital collection borrowing services obtained from free sources or the government. The obstacles in implementing digital libraries include limited budget, competent human resources, infrastructure, and digital library networking. This systematic review is expected to be used as a reference to determine further research agendas and considerations for schools in Indonesia that will implement a digital library system suitable for user needs.

Keywords: Digital Library; School; Implementation

A. Introduction

Digital libraries or electronic libraries have become a global trend in various educational institutions, including schools in Indonesia. Digital libraries refer to software or platform that provides services for users to read, write, and interact with other users using the application (Bala, 2020). Digital library provides services to enhance learning and teaching by delivering content through a mobile interface connected to the internet without time constraints (Brueck et al., 2019). Khomo et al., (2023) state that mobile devices allow users to access services and information without limitations on time and location, mobile users consider efficiency and availability as the primary benefits of digital libraries.

The emergence of various types of digital libraries in Indonesia is supported by the government in various ways, one of which is by providing digital books that can be accessed by teachers and students through the web portal https://buku.kemdikbud.go.id/ or iOS and Android-based digital applications (www.kemdikbud.go.id, 2023). Introducing digital libraries in schools is a proactive step to overcome the problem of students' difficulty in accessing learning resources, which can hinder their understanding of the materials being studied. Digital libraries provide various services tailored to users' needs through mobile access devices such as smartphones, tablets, personal computers, and other portable communication devices. The idea of the emergence of digital libraries is due

to the information explosion and the increasing use of digital devices such as mobile phones and laptops (Chisita and Chiparausha, 2019).

However, there are several factors that need to be considered in the development and use of digital libraries. These factors include hindering factors in the implementation of digital libraries in schools. To date, studies on the implementation of digital libraries in schools in Indonesia are still very limited compared to the implementation of digital libraries in higher education. This systematic review aims to describe the implementation of school digital libraries along with inhibiting factors in their execution. This systematic review can be used as a reference for determining further research agendas and considerations for schools in Indonesia that will implement a suitable digital library system.

B. Research Method

This research uses a systematic review method with a qualitative approach. The data collection method consists of planning, executing, and reporting stages based on Klassen et al.'s (1998) search process.

1. Planning

In the planning phase, the researchers established research boundaries and formulates research questions using the PICOC approach (Population, Intervention, Comparison, Outcomes, and Context) by Petticrew & Roberts (2008). Research boundaries are necessary to ensure that the reviewed journal articles can specifically address the research questions. The research boundaries for this study are the implementation of school digital libraries along with inhibiting factors in their execution.

2. Executing

This research uses the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach to help determine keywords and alternative terms related to the current study. The researchers utilized two databases, namely Google Scholar and Portal Garuda, to identify systematic reviews related to digital libraries published in the last ten years, from 2013 to 2023. The search was focused on scholarly journals as they were considered the most relevant source. The researchers identified keywords related to digital libraries and the influencing factors in their implementation. Relevant journal articles were saved using the reference management software tool, Mendeley, to facilitate the elimination process.

Search terms are a combination and integration of vocabulary with synonyms using Boolean search operators, such as OR, AND, and NOT. The search terms for this research are: (Implementasi OR Penerapan OR Pelaksanaan) AND (Perpustakaan digital OR Perpustakaan Elektronik OR Perpustakaan Virtual) AND (SEKOLAH) AND (Hambatan OR Kendala).

The inclusion and exclusion criteria are used to filter journal articles that are suitable for answering the research aims (Handayani, 2017). The inclusion and exclusion criteria for this study can be seen in Table 1.

Table 1. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
All journal articles published in Indonesian language on the Google Scholar and Portal Garuda databases	Journal articles focusing on library automation
All journal articles published between the years 2013 and 2023	Journal articles focusing on digital library information systems (IT)

Inclusion Criteria	Exclusion Criteria
Journal articles focusing on the implementation of digital libraries in schools, and the factors hindering their implementation	Journal articles focusing on training/ socialization for the use of digital libraries
	Gray literature

After applying the above criteria, the selected articles are evaluated. The assessment of the search results aims to evaluate the quality of journal articles and the usefulness of the obtained data. The supporting questions for evaluating the search results are presented in Table 2. Each question has three answer choices: Yes = 1; Uncertain = 0.5; No = 0 (Adrian, et al., 2016).

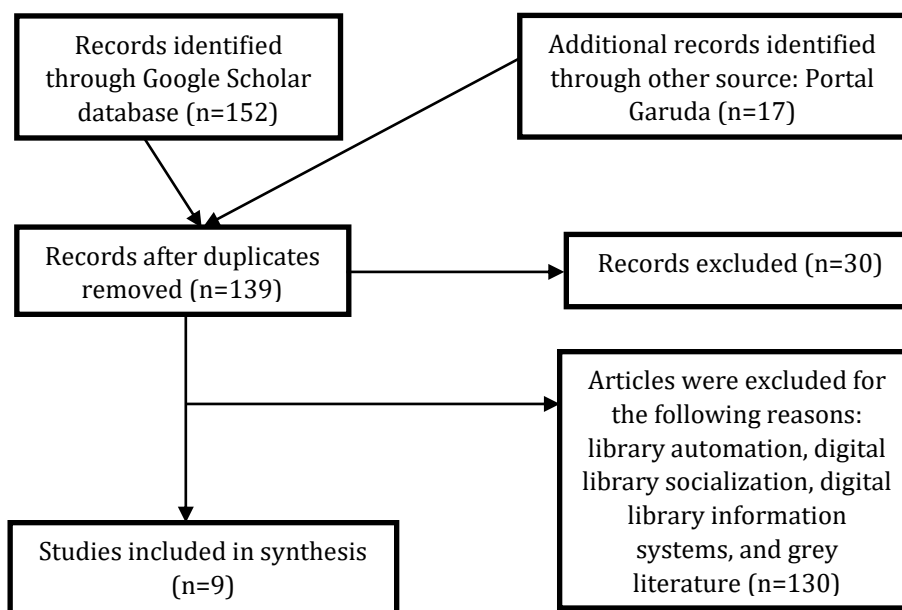**Table 2**. Assessment Criteria based on Search Results

Quality Level Criteria	Questions	Answers
Q1	Is there a clear description of the purpose and objectives of this research?	Yes / Uncertain / No
Q2	Is this research based on a case review?	Yes / Uncertain / No
Q3	Is this research a "lesson learned from a case" or a report based on expert opinion?	Yes / Uncertain / No
Q4	Does this research explain the implementation of the library along with its inhibiting factors?	Yes / Uncertain / No

3. Reporting

The main objective of this stage is to analyze and evaluate various research findings from different literature and to select the most appropriate method to integrate explanations and interpretations of those findings (Salleh et al., 2011). The main stage before conducting the synthesis is to conduct literature mapping. The data is mapped using an analysis table consisting of the author, article title, journal/year, and research results. After mapping with the table, the data is organized in a sequence of words according to the findings in each article. The next step is to draw conclusions inductively, resulting in interesting and useful research findings for all stakeholders involved.

C. Discussion

The processing of search results begins with data selection and extraction involving researchers in the screening and assessment of all articles. The researchers gather relevant studies, and the initial screening process is conducted using the PRISMA methodology. After removing duplicates and applying inclusion and exclusion criteria, the final set of articles to be analyzed in this study is obtained. In Figure 1, the PRISMA flow diagram below presents the selection procedure followed.

Figure 1. PRISMA Diagram

Based on the search results from Google Scholar and Portal Garuda databases, a total of 169 articles were found. After removing duplicates, the number reduced to 139 articles. Following the application of inclusion and exclusion criteria, a total of 9 articles were selected for review in this research. Among the 130 eliminated articles, the majority discussed library automation and digital library information systems. This is a serious concern as there is a misconception regarding digital libraries and library automation. Many academic publications in Indonesia still equate the concepts of digital libraries and library automation. Based on the data collected and the quality assessment of the search results using the criteria, the assessment revealed the lowest score (Table 3.) for the article with the code S02 and S06. The following is an overview of the quality scores of the selected articles.

Table 3. Quality Assessment of Selected Articles

ID	Quality Level Criteria				Total Score	Explanation
	Q1	Q2	Q3	Q4		
S01	0,5	1	1	0	2,5	Qualify
S02	0,5	1	1	0,5	3	Qualify
S03	1	1	1	1	4	Qualify
S04	1	1	1	1	4	Qualify
S05	1	1	1	0	3	Qualify
S06	0,5	0,5	0,5	1	2,5	Qualify
S07	1	1	1	1	4	Qualify
S08	1	1	1	0	3	Qualify
S09	1	1	1	1	4	Qualify

Next, the researchers conducted a literature mapping. Based on the elimination results in Table 4, the following are the mappings of 9 literature sources analyzed in this study:

Table 4. Quality Assessment of Selected Articles

ID	Author(s)	Title	Journal/Year	Findings
S01	Hadiapurwa et al.	Pemanfaatan Perpustakaan Digital sebagai Sumber Belajar Elektronik pada Masa Pandemi COVID-19 di SMA Negeri 3 Batam	Jurnal Penelitian Pendidikan/2021	A website-based Digital Library with features that offer integrated content with Google Sites, BSE, I-Pusnas, and a collection of exam questions.
S02	Damayanti et al.	Digital Library: Upaya Mewujudkan Perpustakaan Sekolah Berbasis Teknologi	Jurnal Pendidikan dan Konseling/2023	It was implemented starting in 2021, providing electronic books. iBerau is an application-based digital library. The funds used to establish iBerau were sourced from the BOS fund.
S03	Adriani et al.	Pengelolaan Perpustakaan Digital pada Perpustakaan SMA Negeri 4 Kendari	Jurnal Literasi Perpustakaan dan Informasi UHO/2021	Its implementation started in 2018. Ibra is an application-based digital library that provides electronic collections such as books, journals, and magazines. The funding comes from BOS and the school committee's funds. The obstacles in its implementation are the lack of competent human resources, slow computer search systems, virus disruptions (malware), and limitations in available digital collections.
S04	Kurniawan	Pengelolaan Perpustakaan Digital di SMA Negeri 1 Yogyakarta	Jurnal Hanata Widya/2016	Its implementation started in 2012. Ibra is an application-based digital library that provides electronic collections such as books, journals, and magazines obtained from free sources, downloaded, and then uploaded to Ibra. The funding comes from the BOS and BOP.
S05	Niari	Pelaksanaan Program Perpustakaan Digital Sekolah Methodist 2 Palembang	Jurnal Inovasi Pendidikan dan Pengajaran/2023	Its implementation started in 2020. It is a website-based Digital Library with features that offer e-catalogues and e-books presentations.

ID	Author(s)	Title	Journal/Year	Findings
S06	Adi et al.	Kualitas Pelayanan Perpustakaan Digital pada SMA Negeri 2 Banda Aceh	Jurnal Intelektualita/2015	It is a website-based library. The development of the digital library at SMA Negeri 2 Banda Aceh is currently limited to expanding the collection of electronic school books, rather than utilizing services that meet user expectations. The obstacles in its implementation are budget constraints for adding digital collections and the availability of competent human resources.
S07	Wuryantini & Purnami	Manajemen Perpustakaan Digital di Sekolah Menengah Atas (SMA) Negeri 1 Temon Kabupaten Kulon Progo	Jurnal Media Manajemen Pendidikan/2023	It is a website-based library. The services consist of providing e-book collections and collections of media conversions. The funding comes from the BOS and BOP. The obstacles include inadequate tools for media conversions, budget constraints for digital library development, limitations in the capabilities of human resources, and the lack of networking and collaboration in acquiring digital collections, both with publishers and other libraries.
S08	Astiti et al.	Pengembangan Perpustakaan Digital Berbasis Website sebagai Fasilitas Sumber Belajar di Sekolah Dasar	Jurnal Kajian Informasi & Perpustakaan/2023	Its implementation started in 2022. It is a website-based library with features that offer integrated content with BSE, literacy, and numeracy modules, storybooks, and instructional videos.
S09	Prabowo & Heriyanto	Analisis Pemanfaatan Buku Elektronik (E-Book) oleh Pemustaka di Perpustakaan SMA Negeri 1 Semarang	Jurnal Ilmu Perpustakaan/2013	The website-based library presents content in the form of e-books obtained by downloading free sources from the internet. The obstacles in its implementation are that some e-book collections require passwords to access.

Based on the selected literature mapping results, it can be observed that publications regarding the implementation of digital libraries have significantly increased from around the year 2021 onwards. It is important to underline that the majority of these articles were published in educational journals, with only 3 articles appearing in specific library science journals. This is significant because the implementation of digital libraries

should be a specialized subject within library science to be considered for evaluating the creation of effective digital library services.

The majority of digital school library implementations in Indonesia are website-based, with only 3 out of 9 schools using an application-based library (Kurniawan, 2016; Adriani et al., 2021; Damayanti et al., 2023). This preference is due to cost-effectiveness, as libraries do not need to purchase digital collections; instead, they can integrate the digital library with electronic sources provided by the government (Damayanti et al., 2021; Hadiapurwa et al., 2023; Astiti et al., 2023), upload freely downloaded electronic sources from the internet (Prabowo & Heriyanto, 2013; Kurniawan, 2016; Adriani et al., 2021), and upload media conversion results (Wuryantini & Purnami, 2023). The analysis of the 9 selected articles shows that all digital libraries in schools primarily offer access to digital collections. The funding for digital libraries mainly comes from the BOS or BOP. Only two articles described the development of a library based on Research and Development (R&D) (Hadiapurwa et al., 2021; Astiti et al., 2023).

The obstacles in the implementation of digital libraries are the lack of competent human resources (Adi et al., 2015; Kurniawan, 2016; Adriani et al., 2021; Wuryantini & Purnami, 2023), insufficient funding for adding collections (Adi et al., 2016; Adriani et al., 2021; Wuryantini & Purnami, 2023), inadequate infrastructure (Prabowo & Heriyanto, 2016; Adriani et al., 2021; Wuryantini & Purnami, 2023), virus disruptions (Kurniawan, 2016; Adriani et al., 2021), and a lack of collaboration in school digital library services (Wuryantini & Purnami, 2023).

The limitation of human resources significantly affects the productivity of the digital library. For example, when only one staff member is available to search for free digital collections, it will take a longer time since that staff member also has other responsibilities in the conventional library (Kurniawan, 2016; Adriani et al., 2021). As a result, the addition of collections becomes very slow, and many recent sources cannot be utilized because they are not yet available in the school's digital library database. The limited budget for developing digital collections has an impact on the completeness of the collection, as librarians have to look for substitutes from free sources. However, this is also highly limited when there are not many competent librarians available in this area (Kurniawan, 2016). Actually, for obstacles related to the budget, it can be overcome by collaborating with various parties in acquiring digital collections. However, the fact is that cooperation between libraries and publishers and book authors is still very limited, making it difficult to obtain digital collections of their works (Wuryantini & Purnami, 2023).

Based on the analysis conducted by researchers, very few schools in Indonesia have implemented a digital library system, mainly due to budget and human resource constraints. The 9 schools that were the focus of the selected articles received full support from various parties, enabling the implementation of this agenda. The integration among stakeholders, teachers, and students played a crucial role in the successful establishment of digital libraries in these schools. Schools allocated specific funds for digital libraries

D. Conclusion

The implementation of digital libraries in Indonesia has significantly increased since around 2021. Most digital libraries in Indonesian schools are website-based, with only a few using applications. The preference for websites is due to cost-effectiveness and easy integration with electronic sources provided by the government or freely available on the internet. Obstacles in the implementation of digital libraries include a lack of competent human resources, budget limitations for adding collections, inadequate infrastructure, virus disruptions, and a lack of cooperation in school digital library services. The nine schools focused on in the selected articles received full support from various parties, enabling the implementation of digital libraries. Integration among

stakeholders, teachers, and students plays a crucial role in the successful establishment of digital libraries in these schools.

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