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## SUSTAINABLE COLLABORATIVE DIGITAL INFORMATION LITERACY INDEX FRAMEWORK FOR STATE PUBLIC LIBRARY AND SCHOOL RESOURCE CENTRE IN MALAYSIA

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### Abstract:

Digital information literacy refers to the ability to access, evaluate, create, and share information using information and communication technologies. It requires both technical and cognitive skills to effectively engage with multimedia content, such as text, images, and sound. Digital information literacy is vital because it empowers individuals to find high-quality information, advance their careers, foster lifelong learning, and build proficiency in navigating the digital landscape. This study was carried out in Malaysia, involving 14 state public libraries and 13 Educational Resources and Technology Sector (SSTP). A qualitative research approach was used, with interviews conducted online through Google Meet. This paper aims to provide readers with a framework for fostering sustainable collaboration between school resource centers and state public libraries, with a focus on enhancing digital information literacy. The proposed framework would guide the development of digital information literacy initiatives within state libraries, supporting the creation of resources and facilities that improve patrons' ability to navigate and utilize digital information effectively and are sustainable for the future. This study presents three key recommendations aimed at promoting the sustainability of digital information literacy within state public libraries and school resource centers.

**Keywords:**

Collaboration, Digital Information Literacy; School Resource Center, State Public Library, Sustainability

**Introduction**

Sustainability is a multifaceted concept that has been defined in diverse ways by various individuals and organizations. Mollenkamp (2023) describes sustainability as the ability to maintain or continue a process over time. Within the realms of business and policy, sustainability entails safeguarding natural and physical resources to ensure their availability for future generations. However, the European Environment Agency (2023) emphasizes that achieving sustainability is a significant challenge, primarily due to excessive and unsustainable consumption patterns. This transition toward sustainable practices is further complicated by factors such as corporate behavior, legislative frameworks, governance structures, technological limitations, and individual actions. Addressing these complexities makes the pursuit of sustainability both demanding and essential. Aytac (2017) argued that libraries are uniquely positioned to serve as pivotal hubs in global sustainability efforts. Libraries, as noted by Edzan Nasir (2023), play a critical role in fostering sustainability by offering free access to information and resources. These services empower individuals to make informed decisions about their consumption patterns and lifestyles. By educating communities and promoting sustainable practices, libraries can contribute significantly to environmental preservation, social equity, and economic resilience.

The United Nations' Sustainable Development Goals (SDGs) underscore the importance of integrating sustainability into various sectors. SDG 4 (Quality Education), SDG 9 (Industry, Innovation, and Infrastructure), SDG 10 (Reduced Inequalities), and SDG 11 (Sustainable Cities and Communities) highlight the growing significance of digital information literacy in achieving these goals. In an era where the digital divide continues to affect marginalized communities, equitable access to digital resources and education becomes critical. Public libraries and school resource centers have a unique opportunity to collaborate in addressing this challenge by promoting digital inclusion and literacy.

Digital information literacy, as defined by Sparks, Katz, and Beile (2016) and Md. Ashikuzzaman (2021), involves the ability to locate, evaluate, and use information effectively in a digital environment. This skill set is increasingly important in a technology-driven world, where information is abundant but not always accurate or easily accessible. As the European Environment Agency (2023) points out, sustainability efforts face significant challenges due to complex behaviors, unsustainable consumption, and inadequate access to relevant information. In this context, digital information literacy becomes a key tool in helping individuals navigate, critically assess, and apply information that can inform sustainable practices. Libraries, as Aytac (2017) and Edzan Nasir (2023) suggest, are uniquely positioned to play a vital role in fostering digital information literacy. By offering access to digital resources and information, libraries can empower individuals to make informed decisions about their consumption and lifestyles. In this way, digital information literacy not only enhances individual knowledge but also supports broader sustainability goals by providing the skills necessary to evaluate and utilize information in ways that promote long-term environmental, social, and economic well-being.

The two main organizations in this study are the state public library and the school resource center. Afifa Rahman (1996) notes that UNESCO defines the public library as a dynamic institution that serves as a hub for education, information, and leisure, providing the community with easy access to a wide range of knowledge and resources. In this definition, the public library is portrayed as an organization that adapts to current trends and plays a key role in the overall development of the community by offering services that meet diverse needs—educational, informational, and recreational. The International Federation of Library Associations and Institutions (IFLA), as the leading global organization representing libraries and information services, advocates for the interests of libraries and their users worldwide. IFLA serves as the global voice for the library and information profession, emphasizing the critical role libraries play in advancing access to knowledge.

Libraries are vital in ensuring free access to all forms of information for everyone, regardless of their background or circumstances (IFLA, 2024). The school resource center and the state public library are two interconnected organizations that rely on each other for the success of educational programs and initiatives. For example, state public libraries depend on teachers, students, and school resource centers to organize events and programs. Similarly, school resource centers often require public library advocacy to manage resources, conduct activities, and provide user service support. However, the COVID-19 pandemic has significantly transformed the educational landscape. The implementation of Malaysia's Movement Control Order (MCO) on March 18, 2020, disrupted many industries, particularly education and services (New Straits Times, 2020). Over the course of 2019–2021, the importance of digital information literacy became increasingly apparent, especially for media and library teachers who were supporting educators in remote teaching and learning. As schools worldwide were forced to close due to the pandemic (UNICEF, 2021), numerous challenges emerged—such as inadequate access to devices, unstable internet connections, and high internet costs—making the transition to online learning difficult (Zulaikha Mohd Basar et al., 2021). Many teachers struggled further, as they lacked the necessary technological skills to effectively teach their students (Newton, 2020; Winter et al., 2021).

This study examines the potential for sustainable partnerships between public libraries and school resource centers to advance digital information literacy. By focusing on collaborative initiatives, the research aims to identify best practices that contribute to long-term educational sustainability and reduce social inequalities. These efforts align with SDG 17 (Partnerships for the Goals), which emphasizes the importance of building robust networks to support sustainable development. Through such partnerships, libraries and educational institutions can play a transformative role in fostering a more equitable and sustainable future.

Recognizing the challenges posed by rapid technological advancements and limited resources, the study explores sustainable and collaborative digital information literacy practices specifically tailored to Malaysian state public libraries and school resource centers. It aims to enhance digital information literacy by addressing the unique needs of these institutions through effective collaboration. Key themes include the development of innovative frameworks, the integration of digital technologies, and the establishment of strong partnerships between librarians and teachers.

The study highlights the importance of fostering a culture of continuous learning, collaborative leadership, and mutual support to ensure the long-term success of digital information literacy

programs within these critical educational settings (Abu, Rafie, & Sha'ari, 2023). The proposed framework is designed to help both state public libraries and school resource centers sustain their activities, particularly in the context of annual government funding allocations for educational programs and initiatives. By serving as a practical reference, this framework is expected to support the maintenance and growth of collaborative efforts, ensuring their relevance and impact in advancing educational and developmental goals.

## Literature Review

As technology continues to advance in today's rapidly changing world, much has been discussed within the fields of librarianship and library science regarding the rise of digital information literacy. Libraries, too, are evolving, embracing new technologies to stay relevant. This section explores the role of Sustainable Development Goals (SDGs) in the context of libraries and information science. What are the SDGs, and why are they significant to the field of librarianship? The SDGs provide a global framework for addressing the most pressing challenges of our time, such as poverty, inequality, and environmental sustainability. In the context of libraries, they offer a guiding set of principles for how libraries can contribute to societal development through access to information, education, and community engagement. Libraries play a crucial role in advancing these goals by promoting access to knowledge, empowering individuals, and fostering lifelong learning—essential elements of digital information literacy. The relationship between digital information literacy, collaboration, and sustainability is central to ensuring the long-term success of digital information literacy programs in state public libraries and school resource centers. By collaborating across organizations and embracing digital tools, libraries can support sustainable development, empower communities, and help ensure that information literacy remains a key resource for future generations.

### *Global Libraries and Their Role in Advancing Sustainable Development Goals (SDGs)*

The role of libraries and school resource centers is integral to achieving several components of the United Nations' Sustainable Development Goals (SDGs). Edzan Nasir (2023) highlights that libraries serve society by preserving and providing access to human knowledge and expression, while school resource centers supply essential learning materials that support educational programs for students, faculty, and staff. Their contributions align with multiple SDGs, including SDG 4 (Quality Education), SDG 9 (Industry, Innovation, and Infrastructure), SDG 10 (Reduced Inequalities), and SDG 11 (Sustainable Cities and Communities).

The research highlights how library initiatives worldwide contribute to improved outcomes across all SDGs, drawing on examples from the Library Maps of the World website. For instance, under SDG 4, libraries are acknowledged as essential pillars of educational institutions, offering safe learning spaces and driving literacy programs. One example is Malaysia's Reading Seeds program, launched in 2016 to foster a reading culture among early childhood learners, involving parents and providing resources to enhance literacy. SDG 9 also connects to the role of libraries, as they facilitate access to research infrastructure and technology, which is crucial in bridging the digital divide. In Romania, initiatives teaching coding to children highlight how libraries can boost digital literacy, which is essential for future employment in a digital society.

Regarding SDG 10 (Reduced Inequalities), libraries provide equitable access to information and resources, helping marginalized communities. For example, the "Kids on the Tab" project in Kenya shows how libraries can enhance educational outcomes for children in urban slums. Similarly, the National Library of the Philippines' Book Cart program brings resources directly to children in parks, promoting reading and learning. Libraries also contribute to SDG 11 (Sustainable Cities and Communities) by preserving cultural heritage and promoting inclusive urban development. Initiatives like digital centers for seniors help bridge the digital gap, empowering older citizens to utilize technology effectively. Finally, SDG 17 (Partnerships for the Goals) emphasizes the role of libraries in supporting community development. The Toronto Public Library, for instance, has collaborated with local agencies to assist Syrian refugees, demonstrating how libraries can enhance decision-making and development efforts.

### ***Communities and Digital Information Literacy***

To grasp digital information literacy, it is essential to understand it, which is the ability to critically evaluate and make informed judgments about information. The American Library Association (1989) describes it as a set of skills necessary for recognizing when information is needed and effectively locating, evaluating, and using that information. Digital literacy builds upon this by encompassing the ability to use information and communication technologies to find, evaluate, create, and share information, requiring both cognitive and technical skills (ALA, 2013). Historically, information literacy has been a central focus in librarianship and education, with its initial framework developed by the ALA Presidential Committee on Information Literacy in the late 1980s. Doyle (1992) provides a widely accepted definition, stating that information literacy involves accessing, evaluating, and using information from various sources, which is crucial for developing informed citizens (CILIP, 2018). The integration of information literacy into curricula enhances its effectiveness, especially when it is problem-based, inquiry-based, and resource-based, aligning with specific learning outcomes (Arua et al., 2018). Collaboration among librarians and institutional stakeholders is essential for creating and implementing effective information literacy policies. As technology has advanced, digital information literacy has emerged as a critical extension of traditional information literacy. The discussion now shifts to popular models and theories in information retrieval to further clarify the concept of information literacy.

One of the primary challenges in the realm of digital information literacy is the digital divide—the gap between those who have access to information and communication technologies (ICT) and those who do not. The concept of the digital divide has been a prominent topic of discussion since the 1990s, as noted by Van Dijk (2006). The divide encompasses various factors that affect internet access, which Charlie (2024) outlines as key elements contributing to unequal access. One crucial step toward bridging this divide is ensuring widespread internet connectivity, with internet access points available in all locations. Van Dijk (2012) identifies four categories of access that contribute to the digital divide: usage, digital skills, physical and material access, and motivation. These categories highlight the various barriers and incentives related to computer and internet access. Of particular importance is the distinction between the "have-nots" and the "want-nots"—those who lack access due to physical constraints and those who may lack the motivation to engage with digital technologies. Motivation, according to Van Dijk, plays a crucial role before individuals can gain physical access to digital technologies.



Furthermore, physical access is not limited to hardware such as computers and smartphones; it also includes other essential materials like paper, ink, software, and subscriptions (Gonzales, 2016), which can require additional financial investment. Another significant challenge is digital skills. As Deursen (2010) categorizes, digital abilities can be divided into four types: operational, formal, informational, and strategic skills. Each of these skill sets is vital for individuals to effectively navigate, evaluate, and apply digital information. Without these skills, even those with access to technology may struggle to fully participate in the digital world. Together, these factors—access, motivation, and digital skills—highlight the multifaceted nature of the digital divide and underscore the challenges in ensuring digital information literacy for all.

### ***Collaborative Innovations in Library Services***

Collaboration has long been a central topic in research and practice, particularly since the 1980s, with a consensus that working together often leads to more beneficial outcomes than working in isolation (Stout & Keast, 2021). Henneman, Lee, and Cohen (1995) highlight that collaboration can be characterized in various ways, with many definitions specifically emphasizing interdisciplinary cooperation. Sustainable collaboration focuses on forming lasting partnerships that can thrive over time while balancing economic, social, and environmental objectives. It involves cooperative efforts among various entities aimed at achieving mutual goals in a way that is sustainable for all parties involved. Such collaborations emphasize long-term impact, resilience, and adaptability, ensuring that resources and benefits are maintained without causing harm to the environment or the partners.

Collaboration initiatives are between the state public library and the school resource center. The characteristic of collaborative initiatives is shared vision and goals, mutual benefit, shared resources and responsibilities, and joint decision-making. Rabuzzi (n.d.), as referenced in Montiel-Overall (2005), noted that when individuals share a common vision, they are more likely to collaborate on various projects or ideas. In such close collaboration, team members view each other as "indispensable" to achieving their main objective.

Soon after, Sacchanand (2012) highlighted that collaborative initiatives boost libraries' ability to enhance the quality of research, teaching, and learning, along with improving library and information services, while also providing financial advantages through the pooling of human resources towards their shared goals. Shelton (2017) emphasized that sustainable partnerships should be mutually beneficial, aiming to provide advantages for all parties involved. Chen and Xue (2010) proposed that this concept of mutual benefit includes various dimensions, such as the advantages gained from goods and services, shared benefits, and collaborative networks. Bruning, DeMiglio, and Embry (2006) noted that mutual benefit can offer a competitive advantage. In this context, both state public libraries and school resource centers contribute to digital information literacy, gaining value from the collaboration, which leads to positive outcomes for all stakeholders. Partridge et al. (2021) emphasized that to assist students in rural and remote areas, public libraries and universities work together by analyzing their services and resources to identify gaps and opportunities for joint resource development. By collaborating and sharing resources and responsibilities, these organizations can alleviate various challenges, including financial burdens. Kundi and Subhan (2023) found that joint decision-making is positively associated with team psychological safety, and that participative leadership strengthens this relationship, as well as the link between joint decision-making and team creativity via team psychological safety. Their research suggests that joint decision-

making can promote more sustainable practices, particularly as state public libraries and educational institutions collaborate to maintain the long-term viability of programs and resources, especially in digital information literacy.

Collaboration has various types, namely inter-organizational collaboration, community-based collaboration, and cross-sector collaboration. Each of these types has the same goal, which is to achieve benefits for all parties involved in the collaboration, for example, Woolley (2023) highlights that sharing expertise among partners enhances task efficiency and provides valuable insights for future projects. Also inline, Cascade Team (2023) identifies several key benefits of cross-functional collaboration: 1) improving customer experience, 2) fostering organizational alignment towards common goals, and 3) achieving a competitive edge through faster innovation. Such collaboration can enhance employee engagement, increase business agility, and improve management skills while addressing stereotypes and diversity issues. Samija (2023) further emphasizes that cross-functional collaboration boosts operational efficiency, facilitates knowledge sharing, fosters innovation and creativity, and strengthens team connections. Dolfma et al. (2022) emphasize that team members from different organizations bring diverse expectations, routines, and perspectives shaped by their unique backgrounds. Longoria (2005) suggests several key considerations for successful inter-organizational collaboration: 1) engaging in dialogue about meanings and assumptions, 2) ensuring adequate resources, 3) maintaining accountability in human service programs, 4) making data-driven decisions with relevant evaluation models, and 5) facilitating knowledge sharing. Ganeshu et al. (2024) point out that the concept of inter-organizational collaboration is often vaguely defined, and existing research has not sufficiently identified the organizational structures and characteristics that foster effective collaboration, despite their critical role in enhancing collaborative efforts. As mentioned before, the various types of collaborative initiatives can be implemented both within and outside organizations. Before entering into any collaboration, organizations should review several key factors related to the selected collaborative type to ensure alignment with their goals and objectives. For instance, state public libraries and school resource centers can engage in inter-organizational collaboration, which involves partnerships between two distinct organizations.

Therefore, public libraries and school resource centers play crucial roles in promoting sustainability across various dimensions. Their contributions to the SDGs, through fostering access to knowledge, promoting digital literacy, and supporting inclusive community development, are essential for creating a more sustainable and equitable society

### Study Method

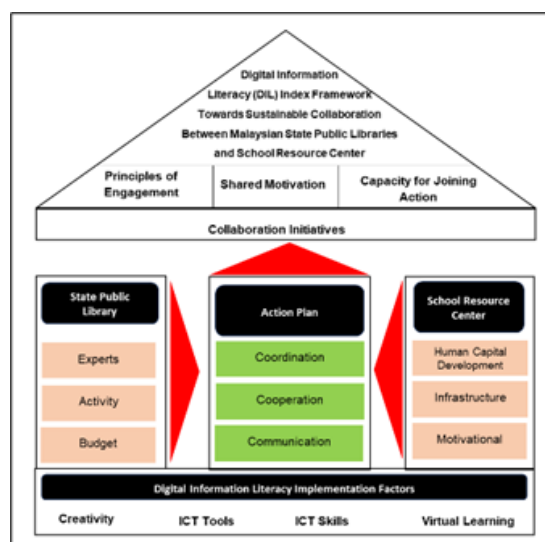
The primary objective of this study was to identify the collaborative dynamic factors that support sustainable Digital Information Literacy (DIL) initiatives between Malaysian State Public Libraries and School Resource Centers. Additionally, the study aimed to develop a Digital Information Literacy (DIL) Index Framework to facilitate sustainable collaboration between these institutions. Adopting a qualitative multiple-case study approach as outlined by Yin (2013), the research was structured into three phases: case selection, data collection, and data analysis. This methodological approach enabled an in-depth investigation across multiple cases, providing a comprehensive understanding of DIL practices and collaborative initiatives in the context of school resource centers and state public libraries.

The study involved engagement with fourteen (14) State Public Libraries and fourteen (14) Educational Resources and Technology Sectors (SSTP) within State Education Departments across Malaysia. Respondents were selected from key personnel within these institutions, specifically Librarians or Assistant Librarians from state public libraries, who play a pivotal role as implementers of library programs and activities. Their involvement is integral to fostering collaborative efforts between state public libraries and school resource centers, as they are directly responsible for executing and sustaining such initiatives.

By utilizing the multiple-case study method, this research enabled a detailed exploration of the factors influencing digital information literacy and collaboration. The findings contribute to the development of sustainable frameworks that strengthen partnerships, enhance digital literacy practices, and support long-term educational goals within the Malaysian context.

## Results And Discussion

The Digital Information Literacy (DIL) Index Framework Towards Sustainable Collaboration between Malaysian State Public Libraries and School Resource Centers presents a structured approach to fostering collaboration in digital information literacy. The framework is depicted as a hierarchical structure, resembling a building with three main levels: principles of collaboration, collaboration initiatives, and implementation factors. At the top level, the framework's overarching theme, Digital Information Literacy (DIL) Index Framework Towards Sustainable Collaboration, sets the purpose of the study



**Figure 1: Digital information literacy (DIL) Index Framework Towards Sustainable Collaboration Between Malaysian State Public Libraries and School Resource Center**

This framework level is divided into three levels. The first level is about Principles of Engagement, Shared Motivation, and Capacity for Joining Action, which drive the collaboration process. The second level focuses on Collaboration Initiatives, represented by a rectangular box containing two vertical boxes: one for the State Public Library (Experts, Activity, Budget) and one for the School Resource Center (Human Capital Development, Infrastructure, Motivation). These boxes illustrate the resources and responsibilities each entity brings to the collaboration. An upward arrow leads to the Action Plan, which connects the initiatives to the collaborative goals. The Action Plan involves Coordination, Cooperation, and Communication. At the third level, the Digital Information Literacy Implementation Factors



are presented, including Creativity, ICT Tools, ICT Skills, and Virtual Learning. These factors represent the necessary resources and skills for implementing digital literacy programs, ensuring the success of the collaboration, and achieving the goals outlined in the framework. The findings of this research suggest that state public library officers and school library and media teachers are integrating information literacy into their instructional practices, with some also incorporating aspects of digital information literacy. However, the use of varied and non-standardized approaches underscores the need for a unified framework that aligns with current educational needs and seamlessly integrates both information literacy and digital information literacy. Developing such a module would promote more consistent teaching practices and enhance the effectiveness of digital literacy initiatives across educational institutions

### ***Component of Digital Information Literacy (DIL) Index Framework Towards Sustainable Collaboration Between Malaysian State Public Libraries and School Resource Center***

This framework outlines a structured approach for sustainable collaboration between Malaysian state public libraries and school resource centers, focusing on shared goals, effective action plans, and essential resources. It emphasizes building a strong foundation, fostering coordination, and utilizing digital tools and skills to ensure successful, long-term digital information literacy initiatives. The framework aims to create an index that can be used by state public libraries and school resource centers to promote digital information literacy and encourage long-term collaboration between the two organizations. This need for such elements within the framework is further validated by feedback from interview respondents, including public library officers and representatives from the Education and Technology Sectors (SSTP). The components integrated into the framework are well-suited for implementation in both state public libraries and school resource centers. These key elements are outlined and discussed as the following.

### ***Relationship of Principles of Engagement, Shared Motivation, Capacity for Joining Action***

The interrelation of these three elements is described as a dynamic that enables both individuals and groups to work more effectively toward achieving a common goal. Emerson, Nabatchi, and Balogh (2012) argue that collaborative dynamics are driven by three interactive components: principled engagement, shared motivation, and the capacity for joint action. These elements significantly influence the quality and effectiveness of the collaborative governance framework. Similarly, Yu-Che Chen et al. (2024) outline these three components which are Principles of Engagement, Shared Motivation, and Capacity for Joint Action—in their framework on collaborative intelligence, which prioritizes collaboration as the central governance objective and emphasizes the role of technology-enabled platforms in facilitating effective collaboration.



**Figure 2: Digital information literacy (DIL) Index Framework Towards Sustainable Collaboration Between Malaysian State Public Libraries and School Resource Center**

The principle of engagement refers to the active involvement and participation of individuals in any process or activity. In the context of a team or organization, engagement is often linked to job satisfaction, strong commitment, and employees' willingness to invest more effort. It also encompasses values such as mutual respect, inclusiveness, and open communication—principles that help create an environment where individuals feel valued and motivated to contribute more. Interestingly, this respondent demonstrates a strong affinity for digital information literacy, even in the absence of many specialists in the field. Rezal et al. (2020) note that principled engagement among collaborative partners, particularly in enhancing and expanding exports, fosters a sense of shared objectives and a mutual understanding of the actions required to achieve the established goals. This principle of engagement is similarly integral to the success of educational institutions, as it contributes to fostering collaboration and driving positive outcomes.

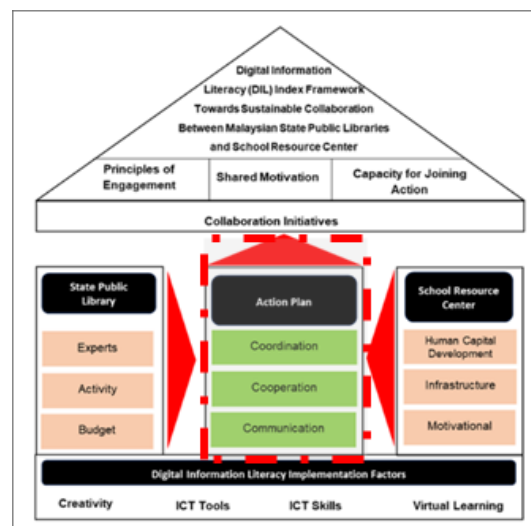
Shared motivation arises when individuals come together around a common goal or aspiration that inspires their actions, fostering a collective drive to achieve something beneficial for the group. Hidalgo et al. (2022) emphasized that shared objectives, especially those developed through hands-on experience and peer interaction in community settings, are a strong motivator for many self-directed learners. This shared motivation stems from a common vision, mission, or set of values, helping align individual strengths and nurturing a spirit of collaboration. In the case of the respondents, this shared motivation is evident in their collective aim to advance digital information literacy and promote sustainable collaboration in the future.

The ability to coordinate efforts toward a common goal refers to the capacity of individuals or groups to work together effectively. This capacity is influenced by factors such as communication skills, leadership, trust, conflict resolution, and access to necessary resources and infrastructure. These factors are crucial in promoting digital information literacy, whether in schools or state public libraries, by fostering collaboration, raising awareness, and

encouraging active participation in the digital environment. Digital literacy entails the ability to seek, evaluate, and use digital information, and a shared motivation to enhance digital literacy can benefit both individuals and groups. In summary, shared engagement and motivation create a foundation for effective collaboration, while the capacity to take coordinated action serves as the mechanism for achieving common objectives. Together, these elements form a robust framework for successful collaboration and the long-term sustainability of digital information literacy, benefiting all stakeholders, particularly state public libraries and school resource centers.

### ***Collaborative Initiatives: Action Plan***

The research analysis in reveals that communication, coordination, and collaboration are key components of the joint initiatives between state public libraries and school resource centers. These three elements provide a strategic framework for advancing digital information literacy and fostering sustainable collaboration between state public libraries and school resource centers in Malaysia.



**Figure 3: Collaborative Initiatives: Action Plan**

Initiating effective communication lays the groundwork for coordination in implementing joint initiatives, which in turn promotes cooperation between the two institutions. As Mathews (2020) highlights, collaboration is a fundamental pillar for the success of inter-organizational alliances. The key components are further discussed below.

### ***Communication***

In the proposed framework, communication serves as a cornerstone for the effective exchange of information, which is essential for organizing and implementing programs successfully. Through effective communication, state public libraries can engage constructively with schools, fostering collaboration and facilitating ongoing discussions about educational initiatives. This involves various activities, such as managing correspondence, handling emails, and coordinating meetings, all of which strengthen partnerships between libraries and educational institutions. The Maryland Department of Labor (2021) identifies effective communication as one of the seven key components of digital literacy for adult learners. This competency involves sharing ideas clearly and creatively with diverse audiences while adhering to established digital communication norms. Highlighting this element within the framework emphasizes its role in enhancing digital literacy programs and fostering a cohesive,

collaborative educational environment. Belshaw (2014) outlines a framework where communication in digital environments involves understanding the specific purposes of online tools, recognizing their similarities and differences, adhering to platform norms, and addressing concepts like identity, sharing, influence, and trust. Similarly, Ferrar et al. (2019) include communication and cooperation as key components of their frameworks, emphasizing the importance of applying communication conventions, understanding power dynamics in online interactions, defining roles and expectations in group work, using appropriate digital collaboration tools, and evaluating their effectiveness. Crown (2018) also underscores communication as a vital digital skill for life and work, highlighting its role in collaboration and information sharing. Drawing on these studies, incorporating communication as a core element in this framework is highly appropriate. Communication is critical not only for initiating and concluding programs but also for ensuring the sustainability of collaborative efforts over time.

### ***Coordination***

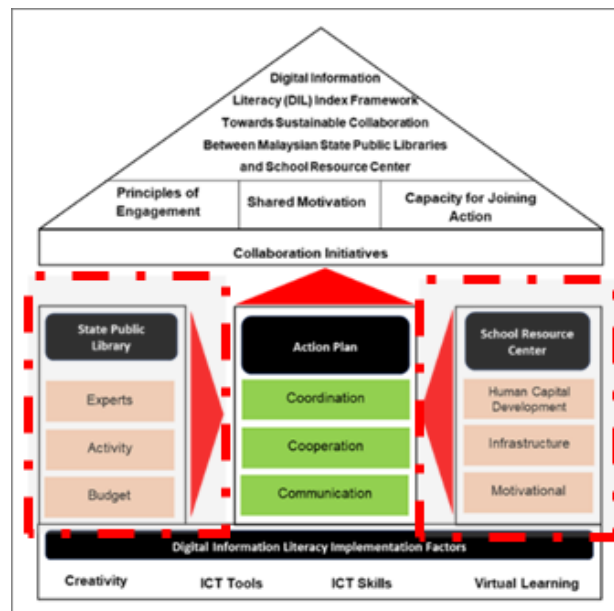
In this study, the focus is on coordination as a key component of the action plan to guide how collaborative efforts contribute to achieving the overarching goals outlined in the framework, as supported by previous research. Malone and Crowston (1994) define coordination as the management of dependencies between activities, drawing on various definitions that have emerged since 1967. In the context of the proposed framework, coordination involves synchronizing activities and schedules between libraries and resource centers. Effective coordination helps minimize redundant efforts and optimizes resource utilization. Collaborative planning fosters the development of integrated programs that leverage the strengths of both organizations, resulting in more impactful digital information literacy initiatives. Schuh et al. (2014) identified three key dimensions of collaborative practice: coordination, cooperation, and communication. The researcher, however, focuses specifically on coordination. According to Schuh et al., two collaborative practices are central to coordination: resource pooling and goal congruence. Resource pooling involves the allocation of necessary information, equipment, and personnel to achieve shared goals, as well as the assignment of tasks and the determination of timeframes for activities. Goal congruence refers to the shared understanding and alignment of objectives among the collaborating parties.

### ***Cooperation***

Expanding cooperation at national and state levels is essential to ensure equitable access to resources and support for developing digital information literacy skills among students nationwide. Emerson, Nabatchi, and Balogh (2012) highlight that cooperation enables key organizations to facilitate multi-party collaboration, particularly in initiatives like smart city development. They identify static factors and dynamic mechanisms as essential elements for adapting to technological advancements. This approach includes policy development, resource allocation, and coordinated efforts among various stakeholders to promote digital literacy education. Such cooperation can result in consistent and effective programs across schools, ensuring equal educational opportunities regardless of geographic or socioeconomic disparities. Crown (2018) emphasizes that communication is a critical digital skill intertwined with cooperation, as it fosters connection, collaboration, and sharing. Similarly, Ferrar et al. (2019) and Schuh et al. (2014) integrate communication and cooperation into their frameworks for designing educational workshops, curricula, and collaborative practices. These findings reinforce the interrelation of these skills in driving successful initiatives.

### ***Digital Information Literacy Collaborative Initiatives in State Public Library and School Resource Center***

Figure 4 illustrates two entities: the state public library and the school resource center. Each entity is depicted as a box or pillar and contains elements that symbolize its unique functions and resources. These elements highlight the specific roles and services offered by both the state public library and the school resource center.



**Figure 4: Digital Information Literacy Collaborative Initiatives In State Public Library And School Resource Center**

To effectively implement digital information literacy programs, expertise is crucial. State public libraries should ensure they have the necessary knowledge and skills within their organization to support these programs. By developing a pool of specialists, they can serve as local resources and consultants, helping to train and develop more experts in the field. In line with national reading promotion policies, engaging activities are vital for promoting digital information literacy. Additionally, adequate funding is necessary to ensure the success of these initiatives. This is because funding is a key factor in determining whether a program can be implemented or not. Based on this study, most library and media teachers lack proficiency in digital information literacy and many do not have formal qualifications in library science or librarianship. This aligns with previous research by Raja Abdullah Raja Yaacob & Saidina Omar Samsuri (2003), Kamal M.A. (2012), Tan (2012), Husain Hashim et al. (2017), and Mohammad Fazli Baharuddin et al (2021). This issue highlights the need to enhance the competencies of library and media teachers. Digital information literacy can support this development through various methods. Adequate and appropriate digital infrastructure is crucial, as emphasized by Mashiyane, Bangani & Van Deventer (2020) and Lomos, Luyten, & Tieck (2023). Additionally, motivation plays a key role in empowering library and media teachers to continue learning and inspiring students, as noted by Williams-Pierce (2011).

#### ***Digital Information Literacy Implementation Factors***

The elements of ICT Tools and ICT Skills represent the foundational technical resources and competencies necessary for achieving digital literacy. In contrast, Creativity and Virtual Learning highlight the innovative and educational strategies that enhance digital information



literacy. Together, these factors provide a comprehensive approach to implementing effective digital literacy initiatives, emphasizing the synergy between technical expertise and creative educational practices.



**Figure 5: Digital Information Literacy Implementation Factors**

Creativity is a key implementation factor in this framework as it enables state public library officers and school media teachers to diversify and adapt digital information literacy programs. Creativity not only fosters sustainability and adaptability in these programs but also engages students by offering varied learning activities that spark their interest. It encourages professionals to think innovatively, design new approaches, and optimize digital literacy initiatives. As the American Psychological Association (2024) notes, creativity involves generating original ideas or solutions, which is essential for transforming digital information literacy programs into dynamic and engaging learning experiences.

Meanwhile ICT Tools are critical in enhancing digital information literacy, encompassing various software applications, online resources, and interactive platforms. Tools such as mobile phones, tablets, and computers enable collaboration, communication, and information sharing, making digital literacy more accessible. The findings from the study highlight that, regardless of the sophistication of the tools, access to basic ICT resources and internet connectivity is fundamental to the success of digital literacy initiatives, particularly in rural or resource-limited settings. ICT Skills are integral to the successful implementation of digital information literacy, as they directly influence how effectively individuals can use ICT tools. Research indicates that while Generation Z is proficient in certain digital skills, gaps remain in areas such as cybersecurity and programming.

The study also points to the importance of ICT skills among teachers and library staff, noting that insufficient digital competencies can hinder the effective integration of digital literacy into teaching and learning. Virtual Learning platforms are increasingly central to digital information

literacy initiatives, providing access to a wide range of digital resources and enabling learners to engage with content from anywhere. These platforms bridge geographical barriers and accommodate diverse learning needs. As the study suggests, virtual learning has become a significant medium for educational activities, especially in the post-pandemic context, where many programs have transitioned to online formats.

Together, these elements consist of creativity, ICT tools, ICT skills, and virtual learning had form the backbone of a comprehensive Digital Information Literacy Index Framework, which supports sustainable collaboration between state public libraries and school resource centers in Malaysia. By promoting resource-sharing, community involvement, and the development of digital competencies, this framework fosters a collaborative and adaptable approach to improving digital literacy across both educational and library settings

### **Recommendation**

Momena et al. (2015) propose several strategies to enhance digital information literacy, including the development of online training modules, mapping staff competencies, assessing training needs, offering advanced and tailored training programs, establishing long-term strategies, and implementing decentralized initiatives. By adopting these strategies, user experiences with digital information literacy (DIL) initiatives can be significantly improved, leading to higher satisfaction and greater engagement with digital resources. Continuous improvement is key, with a particular emphasis on incorporating user feedback to ensure the relevance and effectiveness of the initiatives. Through interviews with library officers and officials from the Education Resources and Technology Sector (SSTP), six key recommendations were identified for state public libraries to empower primary school students to become informed and responsible digital citizens. These recommendations also focus on enhancing teacher competencies and promoting collaborative digital literacy programs with school resource centers. For the purpose of this article, three primary recommendations are discussed in detail.

### ***Skill Credentials for Library and Media Teachers***

The study raises concern about the competency of library and media teachers, indicating that many lack confidences in their digital information literacy and have not fully developed the necessary skills. Although some teachers possess basic information literacy, not all are capable of effectively managing digital resources in educational settings. Continuous professional development is essential, especially since many library and media teachers in Malaysia do not have formal training in library science. The study aims to motivate educators to improve their skills through training and empowerment programs offered by relevant authorities. Additionally, the research investigates the qualifications required to become a library and media teacher around the world, comparing roles across various regions, including Africa, America, Asia, Australia, and Europe. For example, in Africa, teacher librarians typically need both teaching and library training, whereas in the United States, a bachelor's degree in library science and a master's degree are essential. Similar requirements for credentials in library science and education are found in other countries. In Asia, Singapore mandates that librarians hold a postgraduate degree in library science, while in the Philippines, candidates must have a Bachelor of Library and Information Science to qualify for librarian positions. In Malaysia, library and media teachers often serve as subject teachers responsible for managing school resource centers. The study reveals a consistent global trend in requiring teachers to have qualifications in both librarianship and education, highlighting the specialized nature of the

teacher librarian role that combines pedagogical skills with library expertise to support student learning and resource utilization effectively.

Thus, while the research does not focus specifically on teacher competencies, it offers valuable insights into the qualifications and requirements for library and media teachers globally, emphasizing the need for ongoing professional development in digital information literacy. The study also introduces a proposed research framework aimed at evaluating the sustainability of collaboration between Malaysian state public libraries and school resource centers. This flexible framework is designed to address the specific needs of these institutions and guide stakeholders in implementing and maintaining effective digital information literacy initiatives across Malaysia. The researcher encourages field experts to engage with the framework, providing feedback and suggestions for improvement, as collaborative input is crucial for refining the framework and enhancing its relevance for future research.

### ***Targeted Training and Professional Development for Library and Media Educators***

The development of this framework underscores the critical qualifications required for library and media teachers, emphasizing that existing guidelines may not adequately address the diverse skillsets of all library science degree holders. The study highlights the importance of targeted training programs, particularly for experienced educators who may face challenges with new technologies. It advocates for collaborative training initiatives between school resource centers, the National Library of Malaysia, and academic institutions such as Universiti Teknologi MARA (UiTM) and other domestic or international universities, which could significantly bolster teachers' digital information literacy capabilities.

The study further proposes that all library and media teachers should possess a specialized certification accredited by the National Library of Malaysia or an equivalent body. It notes that in many countries, a diploma in library and information science is a prerequisite for teacher librarians, emphasizing the need for policy discussions regarding these qualifications. Additionally, it recommends that individuals holding library science degrees also acquire a diploma in education to be fully qualified for teaching roles.

In conclusion, the study asserts that ongoing training in information technology is essential for library staff, particularly in light of emerging tools such as artificial intelligence. It references a report by the Malaysian Qualifications Agency (MQA), which advocates for short courses or micro-credentials to help professionals stay current with technological advancements. These initiatives are expected to enhance the competencies of library and media teachers in Malaysia, aligning their skills with international standards and setting benchmarks for the continued development of digital information literacy.

### ***Developing Standardized and Accessible Digital Information Literacy Modules***

The study and framework emphasizes the critical need for specialized and standardized digital information literacy (DIL) modules tailored for teachers, students, and library staff. This need is particularly underscored by both officers from the Education Resources and Technology Sector and staff from state public libraries. The respondents highlighted the importance of developing modules that are both user-friendly and accessible, ensuring that they can accommodate a diverse range of users, including those in remote areas or with limited language proficiency.

A key challenge identified is that while users recognize the importance of digital information literacy, many struggle with the complex technical terminology often used in existing resources. As a result, the study recommends the creation of modules that simplify language without compromising the quality of information, making them more approachable for all users, regardless of their technological expertise or language skills.

To address this challenge, the study proposes a collaborative effort between the Ministry of Education and the National Library of Malaysia in the development of these modules. This initiative should align with the National Information Literacy Agenda, launched in 2023, which aims to boost digital literacy among primary school students. By focusing on creating accessible, contextually relevant, and easy-to-understand modules, this collaboration can play a pivotal role in improving digital information literacy, empowering users with the skills necessary to navigate the digital world effectively. The development of these modules would not only address immediate learning gaps but also support the long-term goal of fostering a digitally literate society.

### Conclusion

This study anticipates that the proposed research framework will play a pivotal role in assessing the sustainability of collaboration between Malaysian state public libraries and school resource centers. The framework is designed to serve as a strategic tool for guiding stakeholders—such as librarians, educators, and policy makers—toward the effective implementation and long-term sustainability of digital information literacy (DIL) initiatives throughout Malaysia. By offering a structured approach, the framework provides clear guidelines for fostering collaboration, ensuring that digital information literacy programs are not only successfully launched but also consistently maintained over time. With its adaptable design, the framework can be tailored to meet the specific needs and contexts of individual state public libraries and school resource centers, thus promoting the growth of digital information literacy in diverse educational settings. It is built to accommodate varying levels of resources, technological infrastructure, and local challenges, making it a flexible and practical tool for all stakeholders involved.

Moreover, the study encourages engagement from experts in the field of library science, education, and digital literacy to review and provide feedback on the framework. This collaborative input is essential to refine and improve the framework's effectiveness. By incorporating insights from other researchers and practitioners, the framework will be continuously updated to reflect best practices and emerging trends, ensuring its relevance and applicability for future research and practice. In this way, the framework will evolve into a dynamic and comprehensive resource, further contributing to the advancement of digital information literacy initiatives across Malaysia.

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