
Title	Mobile libraries bridging literacy divides and fostering social cohesion: A PRISMA review of mobile library initiatives
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Mobile libraries bridging literacy divides and fostering social cohesion: a PRISMA review of mobile library initiatives

Although mobile libraries are seen as useful way to bridge literacy divides, there has not been a comprehensive review of mobile libraries in different countries and contexts. This systematic review offers an overview of how mobile libraries have been implemented in urban/rural and low-income/lower-middle-income/upper-middle-income/high-income contexts, reasons for their implementation, factors contributing to the sustainability of mobile libraries and method used to evaluate their effectiveness. The review showed different modes of implementation in different contexts, with increasing access to literacy resources and fostering of social cohesion being two key factors for mobile library implementation. Sustainability of mobile libraries is dependent upon the combined efforts of the government, no-governmental organizations, grassroots and businesses/organizations. Finally, there were limited evaluation studies of the effectiveness of mobile libraries, suggesting the need to develop more systematic evaluation frameworks for evaluating mobile library effectiveness.

Keywords: mobile libraries, social justice, PRISMA review, access to reading resources

1. Introduction

Known as travelling libraries in its early eras, mobile library services have been one of the most popular methods to provide library access and resources to communities that face barriers to traditional library access since the 19th century (Bikos & Papadimitriou, 2018; Want, 1990). In 1960 in Singapore, UNESCO sponsored a mobile library bus named Molly for school visits. Today, Molly continues to serve primary schools on weekdays and neighborhoods with low-income residents on weekends, though the mobile library service is used by all, and not just low-income residents (SG101, n.d.). Globally, mobile libraries now offer more than book delivery to inaccessible areas. In the tsunami-hit neighborhood of Ishinomaki City in Japan, mobile libraries helped to offer reading resources, programs and

comfort to children (Hamada et al., 2019) while a mobile library service in Ghana brought ICT services rather than books to children and youths in underserved regions (Kolawole & Umoren, 2021; Tamakloe, 2014).

The varied examples in the above paragraph show that mobile libraries serve a crucial role in ensuring equitable access to books and other resources for learning by ensuring that the less advantaged have easy access to learning resources (Harvey, 2009). Since reading is associated with academic achievement, independent reading, civic participation and later digital literacy proficiency (Cunningham & Sullivan, 1998; Notten & Becker, 2017; Sullivan & Brown, 2015), access to books is necessary to develop reading proficiency and enjoyment (Adkins & Brendler, 2014; Soulen & Tedrow, 2021). Furthermore, in this technologically enhanced world where artificial intelligence is fast being integrated into daily usage, access to ICT and opportunities to make use of technology for learning is crucial for developing digital literacy skills required for participation in globally connected society (Roswell et al., 2017; van Dijk, 2006).

2. Problem Statement

Despite the important role that mobile libraries play in ensuring equitable access to reading and learning resources, there has not been a systematic review of mobile libraries in different countries and contexts. Without a systematic review of the field, it is difficult to understand how such mobile services are developed, what needs they serve and how they are sustained (Lo & Stark, 2021). Furthermore, given the need for evidence to support the continuation of such services, which are often government or privately funded, it is crucial to know how their effectiveness is evaluated for mobile library service providers to make a case for continued funding and support. The study thus seeks to address the following research questions through the review:

RQ1: What modes of transport were used for mobile library initiatives in low-income/lower-middle-income/upper-middle-income/high-income countries?

RQ2: What are the reasons for mobile bus initiatives?

RQ3: How are mobile libraries managed and sustained?

RQ4: What methods are used to evaluate the effective of mobile library initiatives?

3. Literature Review: The Role of Mobile Libraries in Closing the Literacy/ Learning Gap

Mobile libraries serve diverse communities by extending educational resources and information to places where traditional brick and mortar library services may not be available or accessible, especially in areas that are underserved or rural. Target communities of mobile library services include marginalized communities living in both the rural and urban areas, as well as people in war-torn areas and disaster zones. For marginalized communities in rural contexts, mobile libraries play a large role in improving literacy through provision of educational materials and programs individuals living in such far-flung areas (Lerdsuriyakul, 2000; Butdisuwan, 2000).

In urban contexts where public libraries may seem relatively easy to access compared to rural contexts, barriers such as unfamiliarity with the library (Loh et al., 2022; Neuman & Celano, 2012) and lack of easy transportation (Nichols, 2011) may hinder regular visits to the public library. Despite international improvements in literacy rates, achievement gaps between students from different socioeconomic status (SES) continue to widen (Ng, 2014; Reardon, 2013). The importance of public access to reading resources was highlighted during the COVID-19 pandemic, where young people with less access to books at home were shown to enjoy reading less and read less frequently compared to those with more in the first place in Singapore (Loh & Sun, 2022; Sun et al., 2021). In another study conducted in the United

States, Soulen & Tedrow (2023) found that children had less access to print books during the pandemic and there was a rise in the number of non-readers, likely due to restricted access during the pandemic. As such, mobile libraries may still have their place in urban communities as bridges to public library resources.

Finally, in contexts plagued by war and natural disasters, mobile libraries can serve the temporary needs of a community. Essentially, communities living in disaster-affected areas and war-torn regions often face issues such as extreme social inequity and physical isolation, which makes their needs very different from the people living in rural and urban contexts (Lo & Stark, 2021; Bikos & Papadimitriou, 2018). As such, mobile libraries serving these communities may offer emotional support and agency for people living in these contexts (Lo & Stark, 2021; Sung & Bamkin, 2023). For example, ‘mobile libraries’ in the Polish ghetto during World War II were facilitated by the owners of the ‘Small Underground Library’, where they hand-carry briefcase filled with books and delivered them readers’ homes for borrowing or for exchange (Shavit, 1982).

4. Methods

For the literature review, we conducted a search using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al. 2020) which enables us to have a full grasp of the existing, albeit limited, range of research on the international and local mobile library case studies (see Figure 1 for PRISMA visualization).

4.1. Search terms and databases

The word ‘mobile’ in ‘mobile library’ can hold different meanings in various contexts. While conducting our research across multiple electronic databases on ‘mobile libraries’, we found that the results mainly revolve around the concept of libraries as databases accessible via the internet using mobile technologies such as smartphones, laptops, and tablets. Given the

premise of this research, the word ‘mobile’ in ‘mobile library’ takes on a different meaning than the aforementioned one, denoting the physical mobility and transportability of library services from one point to another. In order to capture the multitude of forms that these mobile libraries took on across the span of the past decades, we have included terms that cover the different terminologies used to refer to mobile libraries across diverse country and historical contexts, as well as the different modes of mobile library transportation that existed. The following search terms were used for searches on four databases - EBSCOhost Database, ProQuest Databases, Google Scholar and JStor:

- “Mobile library”
- “Mobile library bus”
- “Mobile library van”
- “Boat library”
- “Railway library”
- “Library-on-wheels”
- “Bookmobile”
- “Travelling library”
- “Book wagon”

We limited the search to articles published between 2000 to 2023 as we wanted to focus on more contemporary examples of mobile libraries.

4.2. Screening (inclusion and exclusion criteria)

To narrow down articles for the final review, we included articles with the above-listed key terms and ensured that these terms were coupled with transportation terms such as “bus”, “train”, or “boat” in their titles, abstracts or upon a reading of the articles. Other than peer-reviewed articles and conference proceedings (e.g. Jacobs et al., 2016), we also included

dissertations (e.g. Melosh, 2003) and trade publications (e.g. Ruurs, 2005) as they offered additional information by reporting about different implementation and evaluation methods, often from the perspectives of stakeholders. We excluded news publications and studies about traditional libraries, digital libraries (e.g. Davis & Donald, 2008), or libraries that incorporate technology in their service delivery unless there are specific and explicit discussions of these forms of libraries in relation to moving libraries. In total, out of the 46 articles retrieved from the search, 26 articles were included. Additionally, both authors also conducted a search of mobile library-related journals from other sources and checked the reference list of readings to identify articles that may not have surfaced in the search. After including 10 more articles, a total of 36 articles were consolidated for review.

<Insert Fig. PRISMA (2020) Flow Diagram>

Fig.1 PRISMA (2020) Flow Diagram

4.3. Data analysis

We began the process by reading the articles for an overview, discussing the articles and identifying key words and preliminary insights. Thereafter, Author 2 conducted structural coding (Saldana, 2021), noting countries, mode of transportation, impact, setting/geography, funding sources, staffing as well as whether any evaluation was conducted (see Table 1). These characteristics are essential in allowing us to compare mobile libraries across different contexts and examine how these contexts affect the implementation and management of the mobile libraries. While exploring the relationship between the various mobile library characteristics, we further grouped the codes into broader categories and identified themes that mainly surround the disparities between mobile library intervention in countries of varying income levels.

<Insert Table 1. Structural coding of articles>

Table 1. Structural coding of articles

5. Findings

5.1. *Modes of Transport for Mobile Libraries*

Before automobiles came into prevalence, mobile libraries often took the form of wagons, carriages, and carts and were mostly powered by animals such as elephants, camels, donkeys, and horses (Lo & Stark, 2021; Bikos & Papadimitriou, 2018). Advancements in transportation systems and road infrastructure and the development of automobiles has resulted in more efficient and effective delivery of library services around the globe (Bikos & Papadimitriou, 2018).

Despite that, there remains disparities between mobile libraries in low-income/lower-middle-income/upper-middle-income/high-income countries due to the differing rates and degrees of economic growth, resulting in the adoption of different modes of transport for delivery of library services to target communities (Lo & Stark, 2021). This difference reflects the varying levels of geographical and infrastructural barriers faced by the different countries or regions in accessing traditional library services. People living in high income countries such as the United States and the United Kingdom may face the issue of limited access to traditional library services, but they are less likely to face the problem of a complete lack of access to these resources. In addition, the availability and prevalence of motorized vehicles and road infrastructure have enabled mobile libraries in these countries to tap on more efficient ways to delivery library services to people in need via buses, vans, and trucks. This is apparent in Hamada et al.'s (2021) discussion of mobile libraries in Japan in light of the tsunami and earthquake in 2011, where it was possible for mobile library buses to be deployed even to disaster zones which are often deemed to be isolated and remote.

For low-income, lower-middle-income, and even some upper-middle countries, however, geographical isolation and poor infrastructure remains to be the main impediment to active library access, especially for communities residing in remote areas. As discussed by Lo & Stark (2021), lower-middle-income countries such as Kenya and Zimbabwe among many others still rely on animal-powered mobile libraries to deliver books to the rural regions as it is less feasible for them to transport mobile library services the ‘usual’ way via buses and vans to the rural provinces due to reasons such as lack of infrastructural support, uneven terrains, limited resources, and high costs of automobiles. In the example of Pakistan, delivery of mobile library services and outreach initiatives to remote areas were facilitated by camels under the Camel Library Project (Reza, 2023). In Thailand, Pakistan, and Bangladesh, boat libraries deliver educational and reading resources to geographically challenged regions (Fatima, 2003; Lerdsuriyakul, 2000; Reza, 2023). Reza (2023) describes how boats were used to reach regions with ‘network of waterways’ and how it overcomes issues such as difficulty in transportation and human contact – a real problem exacerbated by the COVID-19 pandemic. In Thailand, mobile library trains served people living on the sides of railways, including commuters from both urban and rural areas as well as homeless children (Butdisuwan, 2000; Lerdsuriyakul, 2000).

This difference in the modes of transportation meant an inherent difference in the efficiencies of the mobile libraries, measured in terms of both speed and volume of delivery. Transportation by motorized vehicles such as buses meant that mobile libraries are able to accommodate and deliver more books to the target communities. With the availability of modern technology and internet services, mobile library buses in some cases were even able to be incorporate ICT services and other programs for its users (Berdik, 2016; Tamakloe, 2014). However, for boat or animal-powered mobile libraries, outreach efforts were often limited by the size of the transportation mode itself.

5.2. Reasons for mobile libraries

5.2.1. Mobile libraries bridge literacy divides through access to resources

In countries of all income levels, equitable distribution of literacy resources across states and regions is crucial for increasing literacy rates, typically measured in terms of school grades (Jacobs, 2016; Hunnicutt, 2021; Page, 2010; Attig, 2014). In the United States, mobile libraries were employed to counter the issue of summer reading loss among students, especially those who were labelled as ‘high poverty’ (Melosh, 2003). This reading loss was attributed to the long summer break in between semesters where minimal reading took place and the decline in the students’ reading levels was apparent (Calvert, 2019; Melosh, 2003). Mobile library programs, such as the Beebe Badger Bookmobile, aim to increase productivity and reading during the summer break, and to bring reading materials to students who may not own books at home (Calvert, 2019). In South Africa, Jacobs et al. (2016) documents how provision of books to farm schools and rural areas via mobile libraries encourages learning and reading among students. A unique service of the South African mobile library was that they also guide schoolteachers on certain materials that could help them be more efficient in their teaching. Ultimately, mobile libraries serve to make up for low-SES students’ lack of rich home literacy resources by bringing books into the neighborhood to create a print-rich environment, albeit periodically.

In addition to closing literacy gaps, mobile libraries also serve people living in digital poverty by minimizing gaps in digital literacies. In Ghana, ICT-integrated mobile libraries provide access to internet, laptop, and computers to students from low-income families living in rural areas. These mobile libraries provided educational opportunities for these school children as ICT was an examinable subject in Ghana schools, and the lack of access to ICT services would mean high failure rates among these students from the rural areas (Tamakloe, 2014). In another example, wi-fi-equipped mobile libraries in the United States served as

internet hotspots for American students and provide educational programs such as coding and robotics workshops for its target communities, bringing both technology and skills to these rural regions (Berdik, 2016). These examples highlight how mobile libraries can rethink their service in creative ways, beyond the delivery of books to underserved neighborhoods.

5.2.2. Mobile libraries foster social cohesion by serving communities

In addition to the more common understanding of mobile libraries as enabling access to educational and reading resources, mobile libraries were also seen as essential for fostering social cohesion, particularly as central and communal space for communities in the rural, remote, and disaster-affected regions to connect (Lo & Stark, 2021). Services provided by mobile libraries that serve the marginalized regions are also highly customized to meet specific needs of their target communities, especially refugees and disaster-affected populations, which have very different priorities compared to the general population (Bikos & Papadimitriou, 2018). Particularly in areas hit by natural disasters or fragmented communities, the mobile library spaces serve as third spaces for individuals from different walks of life to make regular connections with others over shared conversations or activities to weave themselves back into the social fabrics of their respective societies.

Several examples of mobile libraries as places that offer emotional support and served as a space to foster a sense of solidarity were present in the review (Hamada et al., 2021; Page, 2010; Sung & Bamkin, 2022). In the post-2010 earthquake in Haiti, the mobile library bus, ‘The Stor’, was introduced to contribute to the well-being and cognitive development of children, and at the same time provide them with avenues for emotional support and intellectual, using bibliotherapy programs and storytelling (Page, 2010). Mobile libraries implemented by Nissan and Shanti Volunteer Association (SVA) as a result of the 2011 tsunami and earthquake in Japan offered infrastructure and space for people to relax as well

as read. Tents were set up for people to enjoy tea drinking in a comfortable space and a diverse collection of books such as manga, novels, how-to books allowed for users to enjoy reading (Hamada et al., 2021).

Mobile libraries also promote inclusivity by tailoring their services to meet the cultural needs of minority communities, commonly through inclusion of mother tongue literature and reading materials. In Greece, the ECHOS library on wheels provided literature of different ethnic languages to refugee camps and communities in and around Athens with the aim of encouraging linguistic diversity and respect for mother tongue (Dignan et al., 2019). To allow for more reading materials to be available in the African languages, some South African districts also explore the possibility of translating English books into the mother tongue language to encourage reading in mother tongue and at the same time learning English in the process (Jacobs et al., 2016).

5.3. Managing and sustaining mobile libraries

5.3.1 Institutional and non-institutional mobile libraries

While most mobile library operations rely on the combined efforts of the government, grassroots, and various business and organizations to run, not all mobile libraries receive the same levels of support to sustain their operations. Mobile libraries tend to be primarily ‘institutional’ or ‘non-institutional’ and can be distinguished by their organizational structure and levels of institutional support.

Institutional mobile libraries which are initiated, operated, supervised, and funded by established institutions such as the government, local education institutions, and traditional public libraries (Lo & Stark, 2021). Such libraries are usually implemented top-down, with sustained funding and support from managing institutions. Integrated into formal library systems, they operate under guidelines, regulations, and policies, ensuring structured service

delivery and manpower management. (Bikos & Papadimitriou, 2018). In many U.S. states, the 'Leading with Intent' mobile library initiative was supported by various government agencies and public institution such as Institute of Museum and Library Services (IMLS). They also worked with the Coast Transit Authority (CTA) to facilitate mobile library operations by reducing transportation barriers for their intended users (Jones & Stewart, 2023). In countries such as the United Kingdom, Singapore, Taiwan, and Greece, mobile libraries were funded and supported primarily by local government authorities, public libraries and education institutions to extend their services to communities from less privileged socioeconomic backgrounds and people living in the rural areas (Bamkin, 2012; Bamkin & Goulding, 2013; Bikos & Papadimitriou, 2012; Chan, 2009; Sung & Bamkin, 2023). The review also revealed a trend of mobile libraries with more diverse funding ecosystems where non-profit organizations, professional organizations, donations, as well as community funding have played a much significant role than before in sustaining mobile library operations alongside government agencies and public sector organizations (Attig, 2014; Bashaw, 2010; Berdik, 2016; de Boer, 2015; Melosh, 2003).

In contrast, non-institutional mobile libraries are mainly initiated by individuals or group of citizens outside of institutional frameworks and are funded by a combination of Non-governmental Organizations (NGO), volunteers, and community groups (Lo & Stark, 2021). While the lack of institutional oversight allows for more flexible approaches, these mobile libraries are also often less sustainable as they do not have a steady source of operations funding (Lo & Stark, 2021; Bikos & Papadimitriou, 2014). A more sustainable but less common model is one where mobile library initiated by NGOs and other organizations also received governmental support. For example, the Punjab Government of Pakistan issued a press release emphasizing the value of reading and investing in libraries (Muhammad Sajid, 2004; Page, 2010). In line with official policy, the mobile library initiative led by the Alif

Laila Book Bus Society (ALLBS) in Pakistan was able to obtain funding support from the provincial government to operate a double-decker bus library. In another example, mobile library initiatives in Dominican Republic spearheaded by UNESCO received funding from various sources such as government agencies, private donations, and other NGOs (Gañan Núñez, 2000).

5.3.2 Staffing and manpower

Additionally, we also observed a difference in the staffing and manpower between institutional and non-institutional mobile libraries. Institutional mobile library staff and manpower tend to hold professional qualifications in library and information science and are often hired through establish libraries, public schools, or government agencies, with formal professional training to manage and operate the mobile libraries (Bikos & Papadimitriou, 2014; Lo & Stark, 2021). In Ghana, an institutional mobile library initiative aiming to increase ICT literacy funded by Electronic Information for Libraries (EIFL)'s Public Library Innovation Program (PLIP) hired mobile library staff and two teachers from each of the five beneficiary schools to oversee operations of the mobile library to better meet the needs of their users. Capacity-building workshops and additional ICT and pedagogical training for teacher-staff enhanced their skillset and capacity (Tamakloe, 2014). Similarly in Minnesota (United States), facilitated by grants from government agencies and other organisations, the BookBike program was operated by staff members from different library divisions who are trained in bicycle safety, technology, and outreach practices (Accero, 2016).

In contrast, non-institutional mobile libraries often depend on private efforts to establish and maintain. The staffing for these libraries usually relies on unpaid volunteers and may not hold professional qualifications relevant to the management of mobile libraries (Lo & Stark, 2021). As such, operations are highly dependent on their willingness to maintain the

library. The dedicated effort of such volunteers can be seen in Yorio's (2019) example where the decoration, driving and support of a summer reading mobile bus were staffed primarily by volunteers. In several low-income and lower-middle-income countries, volunteers still constitute the largest source of manpower for non-institutional mobile libraries in rural and isolated areas, though they also partner up with local communities, schools, and organizations (Ruurs, 2005).

5.4. Methods for evaluating mobile library effectiveness

The most common ways of evaluating mobile library effectiveness are through documentation of number of visits, visitors and book loans (see Table 2). Mobile libraries evaluated their reach through the number of locations visited or programs that met the specific objectives of each initiative and their users (Acerro, 2016; Bashaw, 2010; Calvert, 2019; Chan, 2009; Hamada, 2001; Kidu, 2018; Page, 2010; Tamakloe, 2014). For example, a Book Bike initiative in Rochester, USA, was intended to direct residents to the nearby public library and show how easy it was to get to the library by bike (Calvert, 2009). In addition to usual number counts, they included number of public events attended, number of reference questions answered and enrolment of new library members as part of their evaluation. They also included number of volunteers, their participation and anecdotal user feedback to evaluate their mobile library. More in-depth user experiences were sometimes solicited through interviews or surveys (Chan, 2009; Hamada, 2021; Tamakloe, 2014), with the objective of using the feedback to improve existing mobile library services. Where services extended beyond book access, organizations sought to evaluate the reach and effectiveness of specific programs. Thus, Kidu (2018) looked at graduation rates as they ran training for different age groups and Butdisuwan (2000) counted the number of books, resources such as videos and programs related to their aims to create learning opportunities for rural Thais.

<Insert Table 2. Common ways of evaluating mobile bus effectiveness>

Table 2. Common ways of evaluating mobile bus effectiveness

In terms of more formalized evaluation, Tamakloe (2014) undertook an impact survey of how the Volta Regional Library in Ghana impacted rural schools and Jacob et al, (2016) made use of interviews, documentation, focus groups and observations as part of their qualitative Participatory Action Research (PAR) study with 10 schools in South Africa. The in-depth work with stakeholders allowed them to uncover the specific values and challenges of their mobile libraries and devise strategies for improvement, such as improving the collection with more African language books and teaching students how to take care of library books. In a targeted program to bring books to children in a poor rural neighborhood in Florida to combat the summer reading loss, Melosh (2003) evaluated Grade 2 students' reading motivation, comprehension, fluency and vocabulary prior to and after the mobile library intervention, which lasted for 10 weeks. Teachers who had volunteered with the program also documented the books borrowed whilst the researcher took field notes. While there was no significant impact on their reading proficiency, likely due to the brevity of the intervention, they found that students who had participated in the intervention improved in their self-concept as readers. Given that much research has shown that students' self-perception is likely to encourage more reading, which supports later reading achievement (e.g., McGeown et al., 2020; Torppa et al., 2019), this finding affirms such short-term volunteer efforts.

Country and locale-specific evaluations are necessary as mobile libraries serve contextualized needs and to prompt locale-specific action. In Greece, it was found from surveys sent out to 29 mobile library operators that mobile libraries served a wide range of users, from schools to old folks' homes and prisons, but that many libraries could not be

sustained due to lack of funding (Bikos, 2019). In Taiwan, Sung & Bamkin (2022) interviewed 23 interviewees at six locations and were able to track motivations that encourage children in rural areas to visit the mobile library. Accessibility, routine visits, teachers' familiarity, and children's ease of using the library were some factors that surfaced. Finally, in an unusual study, Bamkin (2013) studied the quality of storytelling on mobile buses in the U.K. through a combination of participant observation, ethnography and grounded theory. Since mobile libraries often include storytelling as part of their programming, the study contributes to understanding of how to make storytelling on mobile libraries engaging for children.

6. Discussion

6.1. A variety of mobile library models

Mobile libraries continue to serve the needs of meeting the literacy and learning needs of underserved populations but have changed in terms of reach over time. The reach of mobile libraries is increased in locations with greater infrastructure and transportation options, as automobiles such as cars, vans and buses allow the mobile libraries to travel greater distances, visit users more frequently and deliver a larger volume of books, resources and programs. Yet, individuals and organizations have been creative in sourcing out ways to move books or resources to those who need them, whether through animals, boats or train. Those in need could include students from schools, prisoners, seniors, rural communities or individuals living in disaster or war-torn areas. Given the increased literacy needs of individuals and emphasis on lifelong learning in a technologically mediated, artificial intelligence (AI)-driven world, it may be necessary for mobile libraries to consider how their programs may serve more than basic literacy needs.

An insightful finding from the review was that mobile libraries did not only serve literacy or learning needs but could also foster social cohesion by bringing individuals in rural communities together over shared experiences or creating some form of normalcy for those recovering from disasters. Mobile library operators can consider this secondary role in their design of their initiatives and also utilize this objective as justification for mobile library operations. For example, Children's Peace Libraries have the twin objectives of bringing literacy and peace practices to their users (<https://friendspeaceteams.org/peace-libraries/>).

While mobile libraries can be both institutionally supported or developed from ground up, those with government top-down support have greater access to resources and are more likely to be sustainable. However, hybrid models with NGOs, government or other public institutions working together with volunteers have also been found to be more sustainable than solely volunteer-led mobile libraries. The intensity of running mobile libraries can differ, with mobile libraries offering training programs or more targeted support requiring trained staff and resources. Many studies have shown that the presence of trained volunteers or staff can improve the services offered by the mobile libraries. Increased dialogue among stakeholders about how to reach desired users and greater community involvement may require more upfront investment but can improve sustainability and reach. On the other hand, small-scale volunteer-led projects such as summer reading mobile libraries in the U.S. may be easier to sustain as short-term volunteer-run projects for specific profiles known to the volunteers compared to yearlong intensive commitments.

6.2. Location-specific evidence-based advocacy and practice

Successful mobile libraries are attentive to the needs of their users, and some organizations and researchers attempted to solicit user feedback in order to evaluate and improve their services. Most mobile library operators collect documentary feedback in the form of number

of users, number of visits, types of visits and number of new enrolments. Some mobile library users obtain survey or interview feedback from users, operators and/or librarians to evaluate success and ways to improve. What counts as success depends on the objectives of each program, but the review suggest that the evaluation process can be crucial for sustaining effective long-term interventions. Such evaluation will also be useful for advocacy and requests for funding to sustain mobile library programs.

The review suggests that more can be done in the area of systematic evaluation of the effectiveness of mobile library programs in meeting the needs of their target communities. Mobile library operators can benefit from training on how to make use of evaluation strategies to document effectiveness, gather feedback and improve services over a period of time. Being able to conduct such evaluations can help operators meet the personalized needs of specific users as well as collate the evidence required for further funding support. The development of evidence-based policy and practices can help mobile library operators improve their reach and meet their literacy/ learning/ social cohesion objectives.

7. Conclusion

In this article, we have provided a systematic overview of the different kinds of mobile libraries, examples of sustainable operational models, as well as the various reasons for mobile library services. Despite the important role of mobile libraries for narrowing digital divides and contributing to social cohesion, research is limited, with as many articles reviewed obtained from trade journals as peer-reviewed research articles for this review. Given the value of mobile libraries in bringing books, resources and programs to underserved communities to close the literacy/learning gap and its potential as a “social equalizer” (Lo & Stark, 2021), it is surprising that there are not more empirical or evaluation studies to document the impact of such services. While each country and community context will have

differing needs and challenges, the broad overview here offers operators and stakeholders an overview of the varied objectives, implementation and evaluation different mobile libraries as they consider how to improve their reach, meet their community needs and account to stakeholders for sustainability.

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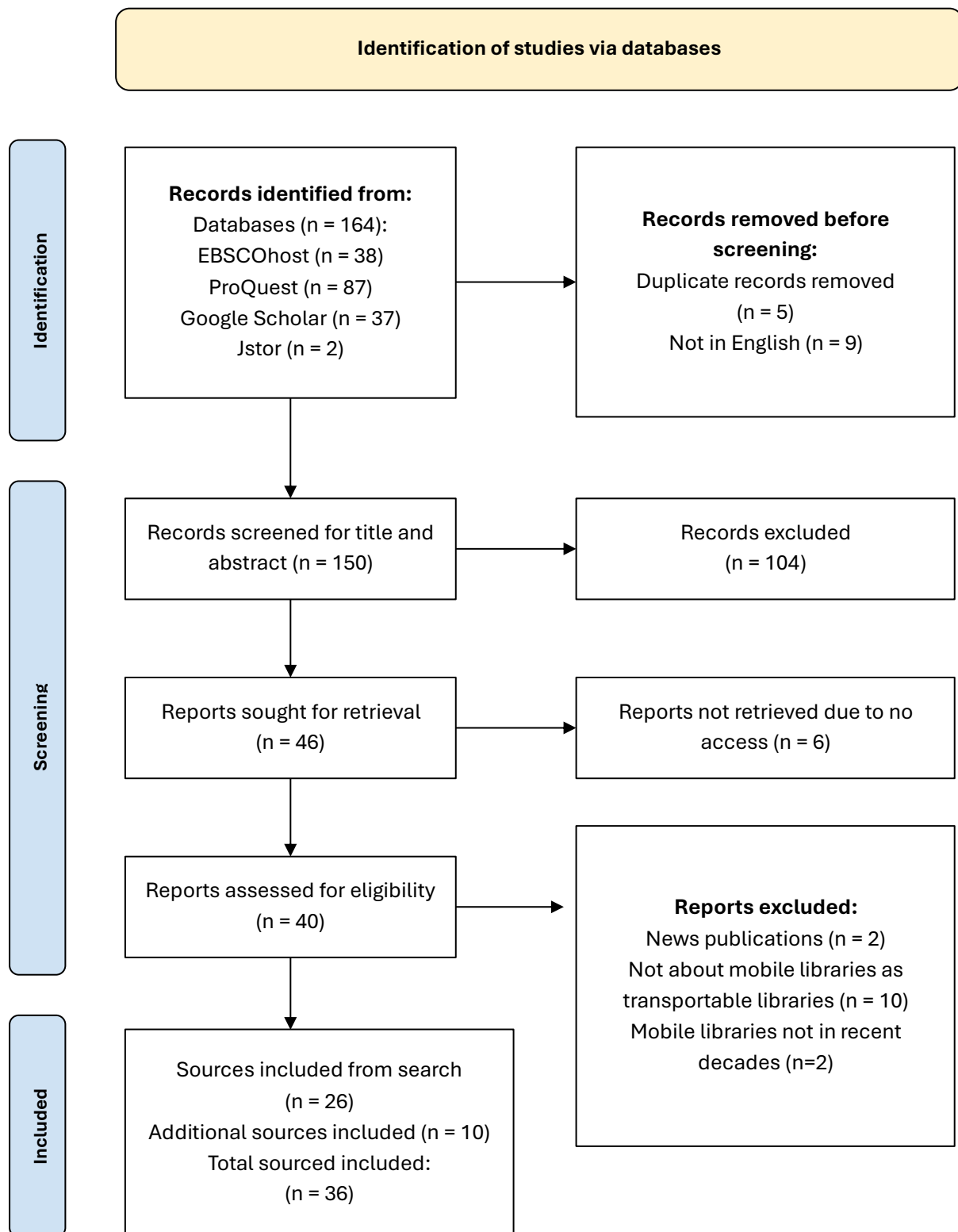
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**reviewed articles*

Figure 1. PRISMA (2020) Flow Diagram



Note: No automation tools were used to exclude records.

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The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*

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Table 1. Structural coding of articles

Study	Country	Transport	Impact	Setting	Geography	Main funding	Staffing	Evaluation Methods	Type of article
Accero (2016)	United States	Bikes	Educational	Urban		NP	P	Mixed methods	Trade publication
Adetayo & Gbotoso (2023)	Nigeria	Vans	Educational	Rural		GV			Peer reviewed
Attig (2014)	United States	Bookmobiles	Educational	Rural		GV	O		Dissertation
Bamkin (2012)	United Kingdom	Buses	Educational	Rural, Urban		GV, LB	O		Dissertation
Bamkin et al. (2013)	United Kingdom	Buses	Educational, Social	Rural, Urban		LB	O	Quantitative	Peer reviewed
Bashaw (2010)	United States	Bookmobiles	Educational, Social	Rural, Urban		GV, NP	O	Mixed methods	Peer reviewed
Berdik (2016)	United States	Bookmobiles, Vans	Educational	Rural, Urban		EO, IN, LB, NP	O		Trade publication
Bikos & Papadimitriou (2014)	Greece	Buses	Educational, Social	Rural, Urban		GV, IO	O	Mixed methods	Peer reviewed

Bikos & Papadimitriou (2018)	Brazil	Bikes	Social			IN, NP	P		Peer reviewed
	Greece								
	United States								
	United Kingdom								
Butdisuwan (2000)	Thailand	Boats, Buses, Trains	Educational, Social	Rural		GV, NP		Qualitative	Conference proceedings
Calvert (2019)	United States	Buses	Educational	Rural, Urban		EO, NP	P	Mixed methods	Peer reviewed
Chan (2009)	Singapore	Buses	Educational, Social	Rural		GV	O	Mixed methods	Peer reviewed
Civallero (2023)	Galapagos Islands (Ecuador)	Container	Educational, Social	Island	IS, LI	NP	P		Peer reviewed
de Boer (2015)	Netherlands	Buses	Educational	Rural		EO, NP	O		Peer reviewed
	Finland		Educational	Urban		EO, NP	O		
Fatima (2003)	Pakistan	Boats, Buses, Trains	Educational	Rural, Urban		GV, IO, NG	O		Peer reviewed
Gañan Núñez (2000)	Dominican Republic	Buses	Educational, Social	Rural, Urban		IO, NG, NP			Trade publication
Genay (2015)	United States	Bikes	Educational	Rural, Urban		GV, NP	O		Peer reviewed
Hamada et al. (2021)	Japan	Buses	Social	Disaster-zone	LI	NP		Mixed methods	Peer reviewed

Hunnicutt (2021)	United States	Buses	Educational	Rural	EO, LB, NP	O	Qualitative	Peer reviewed
Jacobs et al. (2016)	South Africa	Buses	Educational	Rural	IO	P		Conference proceedings
Jones & Stewart (2023)	United States	Vans	Educational, Social	Rural, Urban	GV, LB, NP	O	Quantitative	Peer reviewed
Kidu (2018)	Papua New Guinea	Buses	Educational, Social	Urban	IO	O		Peer reviewed
Kolawole & Umoren (2021)	Nigeria	Bookmobiles	Educational, Social	Rural, Urban	GV, NG	O	Quantitative	Book chapter
Lerdsuriyakul (2000)	Thailand	Boats, Buses, Trains	Educational, Social	Rural, Urban	GV, IN, NP	P		Conference proceedings
Lo & Stark (2021)	Iceland	Bookmobiles	Educational, Social	Rural	GV	O	Quantitative	Peer reviewed
	United States	Bikes	Educational	Rural, Urban	LB	O		
	Australia	Bookmobiles	Educational	Rural, Urban	GV	O		
	Croatia	Bookmobiles	Educational, Social	Rural, Urban	GV	O		
	India	Bookmobiles	Educational	Rural	GV, IN, NP	P		
	China	Bookmobiles	Educational, Social	Rural, Urban	NP	P		

	Zimbabwe	Animal	Educational	Rural	IN	P		
	Greece	Bookmobiles	Educational, Social	Urban	IN	P		
	Japan	Bookmobiles	Educational, Social	Disaster- LI zone	IN, NP	P		
Melosh (2003)	United States	Truck	Educational	Rural	EO, NG	P	Quantitative	Dissertation
Muhammad Sajid (2004)	Uganda	Bookmobiles, Vans	Educational	Rural	IO	O		Peer reviewed
	Thailand	Boats, Buses	Educational	Rural				
	Pakistan	Animal, Trains	Educational	Rural	GV, NG	O		
Page (2010)	Gaza	Buses	Educational, Social	War-torn	IS, LI	P	Qualitative	Peer reviewed
	Haiti	Buses	Educational, Social	Disaster- zone	IS, LI	IN, NP	P	
	Pakistan	Buses	Educational, Social	Rural, Urban		GV		
Reza (2023)	Pakistan	Animal, Buses	Educational, Social	Rural	NP	P		Peer reviewed
Rosen (2014)	United States	Truck	Educational, Social	Rural, Urban	EO, IN, NP	P		Trade publication

Ruurs (2005)	Papua New Guinea	Truck	Educational, Social	Rural			P			Trade publication
	Switzerland	Person	Educational, Social	Rural			P			
	Azerbaijan	Truck	Educational, Social	War-torn	IS		P			
	Thailand	Animal	Educational, Social	Rural	IS, LI		P			
	Kenya	Animal	Educational, Social	Rural	IS, LI		P			
Smith (2017)	United States	Carts	Educational, Social	Urban			P			Trade publication
Sung & Bamkin (2023)	Taiwan		Educational, Social	Disaster-zone	IS, LI	GV	O	Qualitative		Peer reviewed
Tamakloe (2014)	Ghana	Vans	Educational	Rural		NP	O	Mixed methods		Conference proceedings
Yorio (2019)	United Kingdom	Bookmobiles, Buses	Educational, Social			IN, NP	P			Trade publication

Table of Abbreviations

Geographical challenges	
IS	Isolated
LI	Lack of infrastructure
Funding	
EO	Educational Organisations
GV	Government
IO	International Organisations
LB	Library & Library Organisations
NG	Non-government Organisations
NP	Non-profit Organisations
Staffing	
O	Organisation
P	Private/Personal

Method	Details
Documentation	• Number of visits, visitors and book loans • Number of schools or locations visited • Types and number of programmes and attendees • Graduation from programmes • Number of reference questions answered • Number of new enrolments • Number of volunteers
Survey and interview	• User experience, including volunteers • User feedback, for improvement of services • Mobile service providers (evaluate viability, benefits and challenges)
Observations	• Observations are often conducted as part of formal intervention or ethnographic studies

Table 2. Common ways of evaluating mobile bus effectiveness