

Technology use in Government School Libraries in Medellin, Colombia

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School libraries have been widely studied in Colombia from infrastructure capacities to their importance in educational institutions. However, these studies have failed to illustrate librarians' perceptions of technologies, their adoption and how students use technologies within their schools. This research presents a new approach to school libraries in Colombia by identifying technology adoption, use and use of open source materials within public school libraries using a mixed-methods approach. Results reveal low technology adoption among school librarians and high use for students in social media and mobile devices.

Introduction

Many public school libraries around the world have seen their budgets reduced over time. This is true for Medellín, Colombia, where government schools face challenges from insufficient resources, unqualified staff and spaces used as storage, to lack of preparedness, visibility, and, in some cases, lack of libraries within the institutions. In this context, many school librarians are employed for purposes different from library and pedagogical goals and students cannot obtain the benefits from a school librarian devoted entirely to them.

On the other hand, technologies have been playing a significant role within libraries from automation software to programs designed to help librarians interact and promote reading-writing skills effectively with their students. Therefore, school librarians must seek new paths in order, not only to meet their users' needs and leverage low-cost technologies to offer modern services, but to stay relevant within their schools. However, aforementioned circumstances entangled in government school libraries in Columbia hamper the quality of education and school librarians' reputation who struggle to keep libraries open and staffed. This situation has also negatively impacted government school librarians' image among highly-educated library science professionals who opt to work in other types of libraries.

Review of Literature

School libraries in developing countries face critical budget constraints (Santos-Diaz, 2017; Serna, 2017, McEwan, 2015), which prevent them from taking advantage of technology tools to meet their users' needs. Tools such as social media networks can be used to connect with students and parents, post messages about future events, offer extended hours and meetings, and host book clubs (Kirkland, 2007; Lawrence, 2014, Hanson-Baldauf, 2009; Silverman, 2013; Ulusoy & Atar, 2016). Collaborative tools in the cloud are available to work and share collaboratively (Scheeren, 2012;

Emanuel, 2013; Lawrence, 2014; Buerkett, 2014; Silverman, 2013; Deissler, et al., 2015; Smith, 2010; Hanson-Baldauf, 2009; Johnston, 2011). These tools might seem outdated, but for a vast majority of government school libraries in developing countries they may be quite advanced and new in library services. It is important that school librarians offer effective leadership in these rapidly changing areas, as well as develop an understanding of their functions where they can work as a team with technology specialists and teachers (Scheeren, 2012; Johnston, 2015).

Likewise, digital and information literacies are crucial in a digital world where librarians teach their communities how to find reliable information from the best resources available online (Deissler, et al., 2015; Johnston, 2012; Scheeren, 2012). Consequently, Tait et. al (2019) suggest "The purpose of today's libraries isn't only to maintain the traditional roles of promoting reading, developing information literacy and providing access to a collection of books and other resources. Today's school libraries are fundamental to broader digital literacy, information provision and developing critical evaluation of information" (p. 2). In this regard, school librarians must encourage their students to not only read books from physical collections, but also facilitate and discover alternative digital reading formats like ebooks and devices for digital reading such as Kindle, e-readers, tablets, iPads and mobile devices (Ulusoy & Ata, 2016; Knapp, 2019). Additionally, publisher and other websites e-resources and free ebooks, including many children's books and classics accessible for schools and educational institutions.

The skills of the information professional must be oriented to the development of new functions and processes, related to the management of information, the user education for technological interaction and the effective use of information resources. Information professionals are not only mediators, but generators of knowledge, supported by technologies. It has been suggested that information professionals should develop the roles of manager, consultant and adviser (Pirela et al., 2004; Brooks & Kirkland, 2007; Hanson-Baldauf, 2009) "to provide learners with the intellectual tools that allow them an autonomous and creative use of circulating information in society and fulfilling an activating function of thought "(Conforti & Pastoriza, 2000, p.5)

Current financial resources for government school libraries are inadequate to meet the demand for technology resources (Secretaria de Educación de Medellín, 2014). Other studies suggest government school libraries do not meet standards regarding technology infrastructure (Muñoz-Vélez, 2014) and are lacking necessary computers and devices for students and staff. Many do not offer the Internet. This situation leads school librarians to prioritize their limited budgets in order to keep their libraries functioning, with most preferring to invest their budgets in collections and library furniture. A few national and local state-led initiatives and policies have attempted to reduce the digital divide by providing infrastructure in terms of connectivity and devices but have failed to provide for the school library.

Various studies in Medellin have focused on diagnosing school libraries from the perspectives of their staff, collections, services and technology infrastructure (Muñoz-Vélez. et, al., 2014; Naranjo-Vélez, et al., 1997). Secretaria de Educación de Medellín, 2014). These studies found a precarious technology infrastructure within school libraries. Likewise, few library staff, a low level of education and time devoted to other activities in schools have prevented librarians to offer more technology-based services.

Methodology

This study sought to investigate how technologies are used in government school libraries by librarians and students by answering the following research questions:

RQ1. What are school librarians' use of technology?

RQ2. What are school librarians' perceptions and knowledge of open source?

RQ3. How do students use technologies within school libraries?

Our study aimed to identify the perceptions, usability and applicability of technologies within school libraries in government institutions in Medellín through an online survey and interviews to selected institutions. We utilized a mixed descriptive exploratory approach, since it was intended to address an insufficiently studied topic (Bryman, 2016) by proposing to describe the current situation of state educational institution libraries in terms of usage of ICT tools.

Carried out in the city of Medellín, Colombia – the second most populated city in the country and one of the main locations with respect to socioeconomic development – the study involved 110 school libraries (of the 219 existing at the time) located in different municipalities¹, especially in lower-middle socio-economic² classes (strata 2 and 3). The sample size was determined using the non-probabilistic convenience sampling technique, as a scientific research tool whose function is to determine the part of the population that should be examined, in order to best infer the total population. From a well-defined population of 219 school libraries to which the survey was applied, a total of 110 responses (50%) were obtained, confirming that the population was well-represented and lends reliability to the analysis and results.

Respondents were contacted over email which linked to an online survey using Google Forms, due to its high capacity of contacting institutions with access to the Internet as well as of serving as “a faster, more convenient, and cheaper way” of conducting the survey (Andréu et al., 2002, p.106). Data analysis was conducted using the Statistical Package for the Social Science (SPSS) where a descriptive analysis was carried out by using tables and frequency graphs. A descriptive analysis of quantitative data was executed with SPSS through tables, frequency charts and nonparametric tests. The study also used bivariate correlations to calculate how variables were related.

The interviews were conducted individually and face-to face with 23 school librarians. The analysis was carried out with the support of the Atlas.ti software by coding the information based on the categories defined in the study (Strauss and Corbin, 2016). Finally, the results obtained by the analysis and interaction between the quantitative and qualitative findings were contrasted.

Findings

This research sought to identify the use and perceptions of school librarians in educational institutions in Medellín on technologies and the form of their employment by students. We grouped the results into the following categories: technology use, social networking, mobile devices, library management systems, software in school libraries, other electronic devices in school libraries, librarians’ perceptions of technology, librarians’ perceptions of open source software, and librarians’ knowledge of open source software.

Technology use

In this category we wanted to identify not only the use of technologies by librarians and students, but also the perceptions librarians had of technologies, open source, software and the appropriation of technologies within school libraries.

¹ A municipality is a territorial unit composed of neighborhoods. The city of Medellín is composed of 6 zones, 16 municipalities and 275 neighborhoods (Concejo de Medellín, 2016).

² “Socioeconomic stratification is a classification in the strata of residential real estate that should receive public services” (National Administrative Department of Statistics (DANE) (2017).

Firstly, we revisited the school libraries infrastructure by identifying the number of computers for administrative use and patrons. Survey findings show 63% of school libraries have 1 computer for administrative use. The majority of respondents reported 22% to have no computers for patrons.

We explored how librarians use technologies within school libraries (figure 1). School librarians use technologies as means to manage collection loan and returns, followed by administrative tasks, educational processes, user education and reading promotion activities. However, low capabilities in computers limit the use and interactions with students. A librarian told us: “We don’t like to carry out activities with computers and tablets, because of their low specs and we feel embarrassed when computers don’t respond when we do activities with students. They are slow and frequently get stuck and lag. Some tablets don’t have internet connection and are outdated. They have a customized software that’s not attractive for students and they are not allowed to install apps.”

Results evidence librarians do not deem social media activities as part of interaction and communication with their communities. Only 1% said they use computers in libraries for communication, but many of the libraries studied do have profiles in social networks. Additionally, lack of sufficient computers, low requirements, administrative work and lack of training and education of the library staff contribute to limit their use for user interaction.

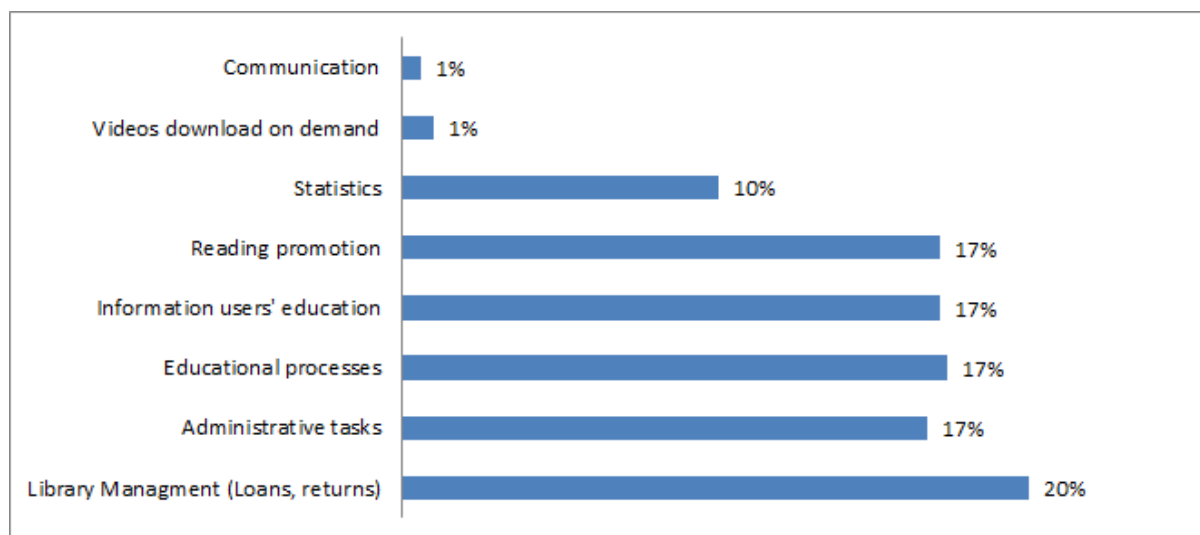


Figure 1. School librarians' technology use.

Social networking. Most school libraries do not have a website linked from the institutional home page, hence they have opted to communicate their information, which is primarily library promotion and open reading groups - through social networks like Facebook and Twitter. They do not have the opportunity to communicate important library events, new acquisitions and key information through institutional channels. Different authors also acknowledge the relevance of these tools to expand libraries' frontiers beyond library hours. (Brooks Kirkland, 2007, Lawrence, 2014, Hanson-Baldauf, 2009, Silverman, 2013, Ulusoy, R., Atar, L., 2016,)

One special activity these libraries has been coined as “*Adopt an Author.*” This yearly local state-led initiative encourages students to adopt an author by becoming familiar with his works. The author eventually visits the school that adopted him/her to encourage students to read and write. Regarding this activity a librarian told us:

It is very promising to see how students tend to read more with this activity, because, they are sure they will have the chance to know the authors and interact with them, so they try to read as much as they can about the authors and when they come to visit us, students ask them questions about their works. With social networking we share information and materials around the activity for students and parents.

It is paradoxical, but some institutions limit not only access to social networks but to wifi hotspots in order to keep students focused on academic matters. Unfortunately, social networks and mobile devices are demonized among education institutions regardless of the importance and benefits they can contribute in education.

Mobile devices. More frequently students bring their mobile devices to schools regardless of the misconception these devices have for educators. Through interviews librarians reported students basically use their mobile devices to:

- Seek and retrieve relevant academic information for their homework.
- Use applications such video games and reading for leisure activities.
- Take notes, create and edit texts for homework.

It was found that librarians do not encourage students to use mobile devices as learning tools or conduct activities with these devices. Librarians could leverage technologies and offer resources locally for their users. One example is librarybox where librarians could create their own private network with curated materials and resources and grant access to their users within the library without an internet connection. Additionally, as some authors argue, mobile devices can be used to access innumerable ebooks, textbooks and much more (Ulusoy & Atar, 2016; Knapp, 2019). In this regard, librarians can play an important role for institutions, their patrons and parents. This characteristic of the librarian as a specialist in content curation is framed within the skills that these school librarians should have (Pirela, et al., 2004).

Library Management Systems. School librarians were asked to identify the systems they used for library management. Not surprisingly we found most of them used Excel 60% for collection management, followed by specialized software as Janium (licensed solely for 20% of school libraries through a local state-led agreement) and other open source options. In spite of diverse alternatives to disseminate information, school libraries do not upload their Excel catalogs to cloud services to share them with their users or with other libraries. When librarians were asked why they did not share their collections in cloud-based services the answers were that they did not know about these cloud services or the idea has not crossed their minds.

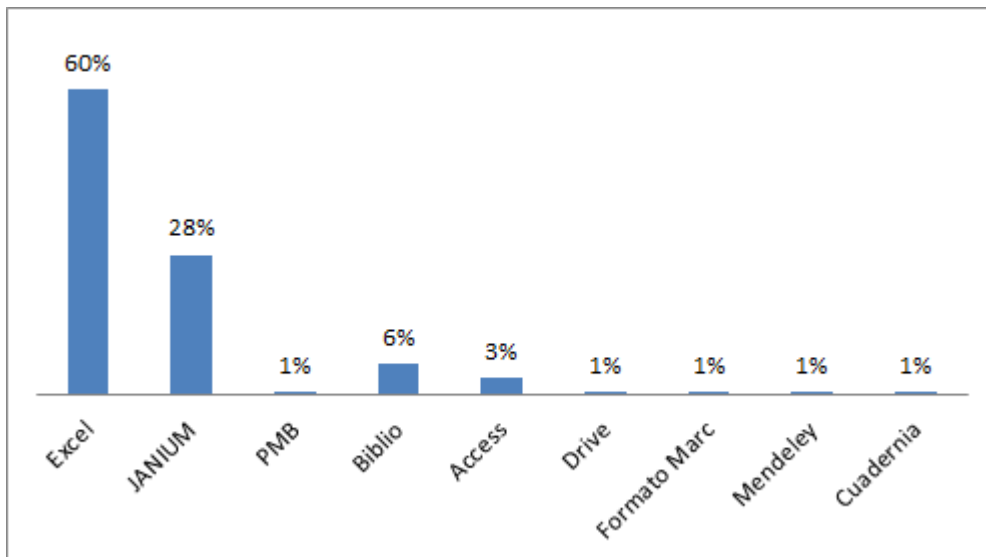


Figure 2. Library management systems used in school libraries.

Software. In order to know how librarians and students use school library computers, we firstly identified the software installed in the computers. Findings show most computers are equipped with software installed by default as the Windows Suite (Operative System + Office suite + Browser) These results suggest computers are not used for many advanced tasks. Researchers asked for browser usage as well to determine whether librarians and students utilized cloud or in-built browser services. Some librarians 8% used cloud services or browser add-on and extensions as well as email via browsers. Librarians also use pc for administrative tasks like reports, statistics and communication. They heavily use Internet browsers to retrieve information for their patrons and update library social media. On the other hand, students use computers to access their social networks, play online, search and access some web pages for homework.

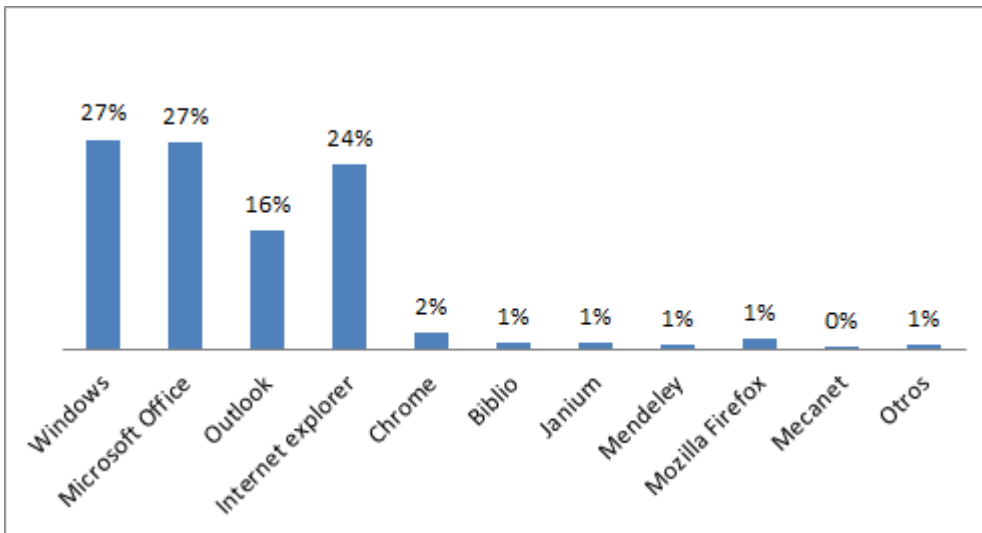


Figure 3. Software in school libraries

Other electronic devices. Libraries have other electronic devices, beyond computers. Among these devices we found tablets and video beams (video projectors) as the most common tools. When we asked librarians how they were used, they responded most of them were institutional resources stored in libraries and they were in charge of their custody. On the other hand, librarians use video beams and televisions to project movies to their students but seldom use them for reading promotion activities.

We expected tablets to be a key tool for writing-reading promotion because of their novelty for students. Nevertheless, these tablets had few educational applications and were beset with connectivity constraints. Librarians were informed to keep them under lock, because they were responsible for the devices and they could be obliged to pay for them if lost.

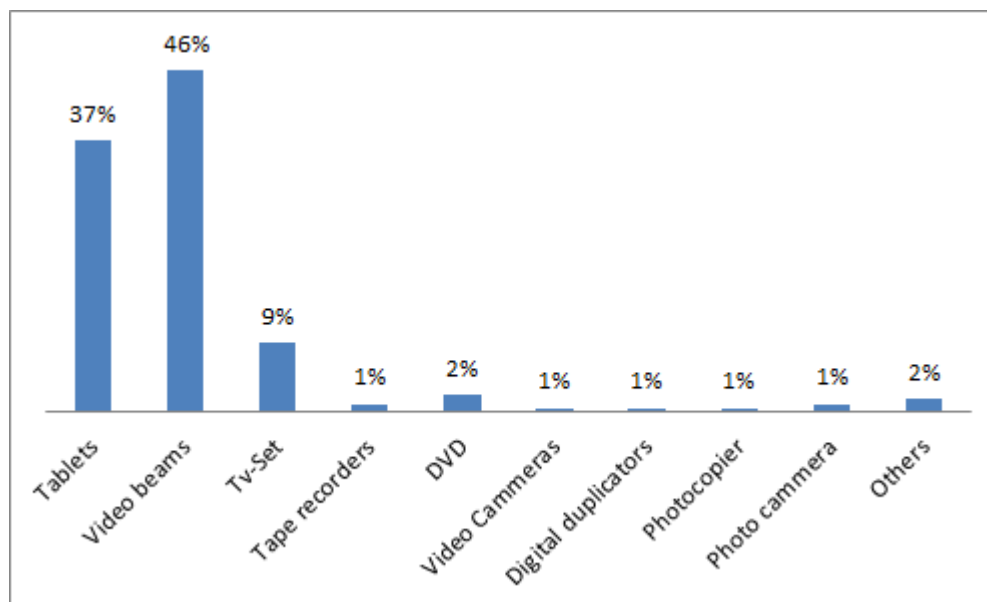


Figure 4. Other electronic devices in school libraries.

Librarians' Perceptions and Beliefs Regarding Technology

This study sought to identify the librarians' beliefs about the benefits technology can bring to students. When librarians were asked about their beliefs, they responded that technologies can help students to:

- Manage their information by retrieving contents more accurately and efficiently for academic and personal purposes. In this regard, school librarians should strongly focus on information literacy education.
- Reduce economic inequalities. Librarians could assist students and parents at identifying and downloading legal required school content online instead saving expenses to acquire the materials.
- Social integration. Technologies have changed the way people and institutions interact and communicate on a regular basis. Through the Internet students can retrieve and stay updated instantly. They can access relevant local contents and share them to whom they concern easily and effortlessly everywhere.

Librarians' Perceptions and Beliefs Regarding Open Source

For research question two, we identified the understanding school librarians had on open source initiatives, the advantages and disadvantages, and the most common tools and software used in school libraries. Quantitative data were collected through the survey. Findings show 71% of respondents know what open source is and they have a clear understanding of it. However, only 20% have open source software installed in their libraries.

Tools such as collaborative publications and sites devoted to editing (Scheeren, 2012) are not considered relevant by the group of librarians studied, much less tools for library management and open software (Johnston, 2011; Deissler, et al., 2015). Since librarians knew of very few additional resources, they have many limitations when installing additional software and they limit themselves to using the programs established by the Ministry of Education, such as Janium and Excel. They also confused open source with free software. In this regard, it may be possible that open source software can save libraries by giving librarians the opportunity to tailor software to meet their users' needs at a very low cost. Nonetheless, most of the school librarians studied did not have the

knowledge and skills to install and customize open software within their schools and are losing the opportunity to offer better services for their patrons.

Conclusions

While it is true that access to new technologies remains precarious in school libraries, particularly in government educational institutions in the city, it is also true that the importance of technology is expanding. Technological tools are not only intended for library-user interaction. They can contribute to library collection management as well by providing open source tools so that school libraries can afford the software they need for their users and management.

This research shows that technologies can offer many possibilities to school libraries and librarians, but unfortunately, many of these libraries do not have professionals with the capabilities to lead these technologies within institutions and deliver their full potential to their users. In this regard, school librarians must receive education and training in technological tools and the Education Bureau of the Department needs to establish and deploy low cost technological initiatives for all the libraries. Examples of these might be shared catalogs in Excel based in cloud services, social networks for all the libraries, installation and instruction of open source software, and resources of curated digital reading materials for students through biblio boxes.

This research was conducted with local government school libraries and as a result a website (<http://biblioteca.espectrovisible.com/>) was developed containing relevant information such as:

- Cloud-Based Catalog: with this initiative we teach school librarians how to create a simple shared spreadsheet where they can have the collections for all the school library networks.
- Digital reading: in this section we shared experiences and resources for school librarians to encourage students to read digital contents.
- Cloud-Based Bookmarks: the aim of this section is to teach librarians how to use tools such as social bookmarking to curate internet content for school students.
- Online presentations: most of the school librarians need to create presentations for patrons and administrative purposes. However, they are not aware of new tools to share and present information beyond PowerPoint.
- Lastly, we created a Wiki for school libraries. This is a tool box where librarians can build a community around open software and share curated contents among school libraries.

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