School Collection Development and Resource Management in Digitally Rich Environments: An Initial Literature Review

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The changing technological environment and the range of digital resources influence the role of the school librarian in collection development and management of digital resources. As digital technologies have evolved collection development remains a significant component of the school librarian’s professional practice. The aims of this paper are 1) to understand the influence of technology on the evolving material collections in K-12 schools, 2) examine the changes in collection development and resource management brought about by technological innovation, 3) investigate the leadership role of school librarians in collection development and the promotion of digital learning objects or resources, and 4) summarize the relevant literature focusing on school library collection development and management of digital resources. This article will present a brief overview of the impact of technology on the collection development practices of librarians in K-12 schools.

Introduction
The proliferation of digital information does not recognize constraints of time and space. Emerging technologies allow information seekers to satisfy both personal curiosity and assigned research tasks. Increased computer availability, use, and drastic changes in technology have given rise to multimodal social media, such as blogs, wikis, podcasts, and social networks (Lenhart, Anderson, Smith, Duggan Perrin, 2015). Multimodal social media is collaborative, interactive, non-sequential and combines text, graphics, and audio. These digital resources by their very nature pose significant challenges for school librarians in materials selection, de-selection, budgeting, and materials evaluation. Johnson (2009) contends, “decisions about e-resources cannot be separated from the decisions that librarians make on a daily basis” (p. x). While material formats have expanded beyond print, the librarian’s responsibilities in collecting and providing access to materials have not changed (Fieldhouse & Marshall, 2012).

The exponential growth of technological innovations and information requires the expertise of an information specialist to assist library patrons to locate, use, and evaluate emerging technologies, data, and global communications (American Association of School Librarians (AASL), 2013). Digital databases, computer searches, and electronic documents and articles have significantly altered the concept of collections (Fieldhouse & Marshall, 2012). Library collections traditionally are defined as materials organized, housed, and accessed from...
a specified place (Fieldhouse & Marshall, 2012). School library collection guidelines from 1900 to 1980 suggested specific materials and equipment, “housed in a central location” (Callison, 2009, p. 210) rather than integrated throughout the school. The school library of the 21st century challenges the notion of “territories of resource ownership within the school and no initiatives to share” (Callison, 2009, p. 210). Web based resources afford continual access and unrestricted physical ownership. Through the careful analysis of learner needs, the learning environment, and instructional learning resources, the scope of the library collection is extended. Approaching the latter part of the 20th century and the early 21st century the proliferation of technological innovations notably altered the meaning of collections and the process of collection management (Fieldhouse & Marshall 2012). Terminology used to describe the concept of collection development changed to explain more accurately the process. This article discusses the literature on collection development and management with regard to 21st century library collections.

**Literature Review Method**

The systematic review of the research cited in this article was gathered from a variety of sources, both print and Internet. Keyword searches included, but were not limited to such terms as "collection management", "digital resources", "digital collections", "school technology", "web 2.0 tools", "resource management" "school library materials" "curation", "leadership", "librarian leadership", "leadership standards", "technology leadership" "transformative leadership" and "instructional technology". Selected journals included but were not limited to *School Library Media Research, School Library Journal, Educational Technology & Society, Library Media Connection, Library Trends, District Administration, Journal of College Science Teaching, and School Library Research*.

Relevant literature was reviewed using the following parameters:

1. Peer-reviewed studies, professional articles, and books published between 2000 and 2015.
2. Peer-reviewed studies, professional articles, and books focused on K-12, academic library, and public library collection development and management.
3. Peer-reviewed studies, professional articles, and books relating to subject matter such as digital curation, digital collections, descriptions, and characteristics of 21st century learners.
4. Peer-reviewed studies, professional articles, and books with relevance to librarian leadership, teacher leadership, and types of leadership

Selected articles from the various sources were located by accessing the EBSCO suite of databases provided by the Houston Independent School District (HISD) and using OneSearch through the Florida State University Libraries website. With the exception of *Collection Development in the Digital Age* (Great Britain) all books and articles were published in the United States and were published in English. Once compiled, the articles were then reviewed for consistent mentions of trends and historical developments that affected the practice of collection development; those themes are presented in the next main section.

**Preferred Terminology**
For this study, journals and an online dictionary were used to determine appropriate definitions for collections, collection development, and collection management. Prior to 1960 selection was the preferred term for the accumulation of materials and equipment for use by library patrons. The priorities of the school, the needs, and interests of the students, and the requirements of the school curriculum reflected the “thoughtful process of developing a school collection” (Johnson, 2009, p. 1). During the late 20th century, collection management came into vogue, but was replaced with collection development “as a more encompassing term” (Johnson, 2009, p. 1). Collection development and collection management are synonymous (Fieldhouse and Marshall, 2012) and includes numerous activities related to policy development, needs assessment, resource sharing, and collection analysis (Johnson, 2009). The definition of collection has expanded to include digital resources (Reitz, 2010).

The very definition of a school library collection is changing to take into account an ever-widening array of resources from online course modules to digital textbook materials to data sets. School librarians are responsible for collecting resources in a variety of media types (e.g., digital video, electronic periodicals, podcasts, e-books, and audio books) and must be fluent in a variety of devices through which this content is delivered (e.g., laptops, e-book readers, tablets, smart boards, student response systems) (AASL, 2009; AASL, 2013). The ever-advancing state of technology, distance learning, and virtual environments are transforming school libraries from "warehouses for books and equipment into the hub of the learning community" (Purcell, 2010, p. 300). Librarians working in K-12 school settings, function in the unique role of connecting teachers and students to the resources needed for instruction and learning (AASL, 2009). The American Association of School Librarians (AASL) and a variety of professional organizations support the leadership role of the school librarian in promoting activities and technology tools that engage students, encourage the development of lifelong learning, and the endorsement of the various literacy skills inherent in a participatory culture (AASL, 2009). AASL guidelines include providing access "to physical and virtual collections of resources" (AASL, 2009, p. 29). An historical review of the rise of the information economy, computer development, internet and technology innovation, and network access provide the context for the modernization of school library collections.

Major Trends Affecting Library Collections

In 1968, Peter Drucker described a post-industrial economy based on knowledge and coined the term knowledge worker. Drucker equated knowledge with information and predicted that the third age of socio-economic development would be the information society; Drucker recognized and understood well ahead of his peers that what he called knowledge would be the essential capital in the new economy. The rapid expansion of technology has given rise to an infinite number of information-based transactions via the internet. The post-industrial economy envisioned by Drucker (1968) is embodied in the digital world of the Internet. In the 21st century, the rapidity with which information traverses the globe requires creative adaptation in information navigation, dissemination, and use.

The current information landscape emerged in the mid-20th century and has been characterized by a shift from traditional industry to an economy and workplace based on information access through computerized means (Chen, 2008; Pilliana, 2009; Sasse, Schwering,
& Dochterman, 2008). The technological innovations wrought by this period have changed and continue to change the manner in which librarians approach materials curation. AASL encourages school librarians to leave behind schools that "still embody a 20th century industrial model" (AASL, 2009, p. 46) and strive to enact leadership in an environment that has been transformed by technology.

The Internet and the Library OPAC

The library catalog is an historical tool that changed as computer automation became available. According to Chelton and Cool (2004) computer information systems expanded exponentially between 1980 and 1990. Using data from library catalogs, patrons have access to valuable library collections; however, in the technology driven information age “library leaders must move swiftly to establish the catalog within the framework of online information discovery systems of all kinds” (Calhoun, 2006, in Kaun, 2007). Bisson (2006) enumerated four obstacles to redesigning library OPACs to meet the needs and expectations of 21st century learners: 1) usability; 2) findability; 3) interactivity; and 4) architecture. Usability is equated to the user-friendly searching of Google and amazon.com. Findability is the equivalent of making every catalog search “a fruitful one” (Kaun, 2007). Interactivity means permitting user generated content to be added to library OPACs. Architecture refers to catalog interfaces that allow simultaneous access to several different information delivery systems. (Kaun, 2007).

The availability of digital resources in school library collections is often hindered by their limited accessibility through conventional finding aids like the school library online public access catalog (OPAC). The inclusion of digital content in learning object repositories accessible through the school library online public access catalog (OPAC) “allow for greater ease in finding and using objects for both classroom and online instruction” (Haughey & Muirhead, 2005). New electronic resources of this era afforded electronic versus manual information retrieval, provided more current references than previously possible, and granted access beyond the library setting. Chelton and Cool (2004) wrote, “It is not an exaggeration to say that electronic information systems of all varieties have changed the way we live and think” (p. 1). Digital information presents new challenges to the field of school librarianship. The full impact of the new forms of information technology is unclear. There are far reaching implications that include index design, evaluation, and the utility of book index features in an online environment.

Vision of Multimedia

The origin of school libraries as centers that provide various media dates back to 1578 in Shrewsbury, England. Private schools in late 18th century New England had libraries. DeWitt Clinton, a New York governor, proposed legislation for public school libraries in 1827. The National Education Association (NEA) formalized “the roles and responsibilities of school librarians” (Johnson, 2009, p. 8) in 1896. The American Library Association (ALA) published school library standards in 1918 and 1920 which “directed school librarians to select books on the basis of what was needed for classrooms, students’ recreational and cultural needs, and
curricular needs and recommendations by teachers” (Johnson, 2009, p. 9). School librarians began to collect “alternative media in the 1960s” (Johnson, 2009, p. 9).

Although the earliest libraries were public and excluded children, the foundational ideal of service to the library user underpins the mission and vision of the school library in providing a "bridge between formal, school based learning and independent, lifelong learning” (AASL, 1998, p. 122). The short sightedness of excluding children from libraries was soon realized and children’s services pioneers such as Anne Carroll Moore, Augusta Baker, Frances Clarke Sayers, and Charlemae Rollins (Walker, 2010) set about to rectify the situation. Soon libraries were creating spaces specifically for children and Arthur Bostwick proposed the specialization of children’s librarian at the 1913 American Library Association (ALA) annual conference (Walker, 2010). The ALA and the American Association of School Librarians (AASL) remain pivotal organizations in establishing and promoting standards that give guidance to school librarians in planning and implementing quality school library programs.

Library pioneers who envisioned services for children in the early 20th century "were committed to providing children with books to read not because reading was fun, but because reading was essential to their intellectual, aesthetic, and moral development” (Walter, 2010, p. 23). These pioneers worked with fervor to collect and build suitable materials collections. Empowering Learners (AASL, 2009) addressed this facet of teaching and learning, indicating that the school librarian "partners with classroom teachers, specialists, and other literacy colleagues to make decisions about reading initiatives and reading comprehension instruction” (AASL, 2009, p. 23). School librarians continue the tradition of building a "well-developed collection of books, periodicals, and non-print material in a variety of formats” (AASL, 2009, p. 38).

**School Collection Development Imperative**

Collection development is the exclusive responsibility of school librarians and is paramount among the many roles of the school librarian. Callison and Preddy (2006) rank collection development highest among the tasks of school librarians. The contention of Callison and Preddy is that “selecting, acquiring, organizing, and providing access to resources remain common skills of the professional trained in library and information science for school service” (p. 201). The recent decade raised the level of collection development and resource management from a basic function to the center of instructional analysis, curriculum creation, and “meaningful learning objectives” (Callison & Preddy, 2006, p. 201).

The American Association of School Librarians (AASL) (1998) guidelines recognized collection development as part of “the school library media program’s primary responsibilities” (p. xiii) relative to “information access and delivery functions” (p. 83). AASL’s (2008) new guidelines, Empowering Learners, continue this emphasis. Indeed, collection development has become a technology integration activity in and of itself. Despite these imperatives implicit in guidelines and standards, research demonstrates that collecting and promoting digital resources and technologies is not widespread practice.

Librarians have a unique role among educators in that they connect classrooms to the resources needed for learning (AASL, 2009). The four librarians’ roles described in Information Power (AASL, 1998) enable librarians to leverage “their technology expertise in their work with students and teachers” (Hoffman & Mardis, 2008, p. 8). Successful school librarians actively

Managing print and digital resources entail similar tasks and procedures, however, “online resources have unique characteristics that make working with them quite different than the books, magazines and AV materials we’ve managed in the past” (Johnson, 2007, p. 46). The less visible digital resources are difficult to display. Digital resources circulate differently, but “should be found when doing a catalog search just like their print cousins” (Johnson, 2007, p. 48). Online resources require demonstration and orientation just as physical ones. School librarians must make online resources visible by promoting them to students and teachers through library orientation, library web pages, and research learning units.

**Engaging 21st Century Library Users**

Emerging technologies have fundamentally changed the complex nature of the skills needed to navigate the vast amount of available information. Schools must, according to Irvin (2007), explicitly teach the "skills for selecting, analyzing, organizing, and summarizing information" (p. 7). The demands of these new frontiers compel the school librarian to "play a leading role in weaving such skills throughout the curriculum" (AASL, 2009, p. 46) and expanding the development of transliteracies considered essential 21st century skills. Transliteracy is the ability to read, write, and interact across a range of platforms, tools, media, and social networks (Ipri, 2010).

Social media technologies provide an interactive literacy rich setting with multiple visual representations coupled with an environment in which 21st century learners send and receive, create and disseminate, access and retrieve digital texts (Antonenko, Jahanzad, & Greenwood, 2015). Students currently enrolled in schools today, have never known a society without digital age tools (Prensky, 2012).

These students, according to Connaway, Radford, Williams, and Confer (2008) are collaborative; active learners; efficient visual processors; multi-taskers; confident; achievement oriented; and prefer immediate responsiveness to delays. Additional characteristics of 21st century learners include skilled technology use, comfort with frequent change, unrestricted by time and space, globally connected, and at ease with the loss of privacy (Connaway et al., 2008). Other observable traits of learners in the 21st century include continuous connectivity; portability; and self-generation of content and products. They function in environments that are perpetual and virtual (Connaway et al., 2008).

Contemporary students are skilled users of digital content and quite comfortable interacting in online environments. Today’s youth engage with systems that allow for a level of interactivity and connectedness that previous systems did not permit (Lucas, 2012). There are implications for the role of the school librarian in the technologically changing landscape of the K-12 educational environment. As information formats have evolved, access to information, digital resources, and print materials remain an important component of the librarian’s function (AASL, 2010). Digital resources are less visible, difficult to showcase, and problematic to

Kolikant (2009) speculates that because the structure of schools was established before the invention and proliferation of computers, “schools remain mired in book technology” (p. 132). Digital and analog are phrases used by Kolikant to distinguish today’s students from their teachers. Teachers, according to Kolikant, may view computers as unreliable and inefficient in contrast to students. Students value the rapidity with which they can access information and complete assignments. He refers to students as digital children and indicates that they are comfortable manipulating vast amounts of shifting information, but that the school structure and teaching is slow to make the adjustment. Digital children expect “fast paced, interactive, instruction” (Kolikant, 2009, p. 132) and teachers and students are the beneficiaries of increased technology access. The pace of technology-based change has ramifications for the manner in which librarians build library collections.

**Building Digital Resources**

School library collections are a support mechanism for teachers and students. An adequate supply of quality digital learning content in K-12 settings is increasingly important, but great deal of confusion exists in the definitions used to describe digital learning content. Varying perspectives make defining and clarifying the purpose of digital resources difficult. Digital learning materials include, but are not limited to, virtual field trips, videos, simulations, gaming environments, music, text, and images (Foreman, 2004).

A student in the late 20th century searching a school library’s online catalog could expect to locate a large quantity of books, journals and other print resources. Students in modern day 21st century schools may find interactive, web-based learning objects in the school library collection. Digital learning objects are defined as “interactive web-based tools that support the learning of specific concepts by enhancing, amplifying, and/or guiding the cognitive process of learners” (Kay & Knaack, 2009, p. 148). There are distinct advantages to the incorporation of digital learning objects in school library collections.

Digital resources vary “from more traditional learning materials in a number of important ways” (Haughey & Muirhead, 2005). Cross-curricular teaching is possible with web access to digital learning materials. The inherent interactivity of digital content is an important advantage. Effectiveness and efficiency, argued Duval, Hodgkins, Rehat, and Robson (2003), are accomplished with quality digital content, providing readily available, shareable content at minimal costs. Digital objects incorporate sound, text and images, which accommodates the digital students’ shift away from linear, deductive learning. The diversity of digital resources enable successful use and reuse by a variety of age levels and abilities. Haughey and Muirhead (2005) suggest that the strength of learning activities in digital resource designs incorporate “interdisciplinary experiences across curricular areas” increasing functionality and reusability.

School libraries as digital learning resource centers “can renew and complement knowledge at any moment” (Chen, 2009, p. 3). The most recent information can be found on authoritative internet sources and unlimited library users are able to access the information simultaneously. In addition to the option to provide current information, digital information saves shelf space solving the problem of insufficient space and budgets. Finally, the plethora of
digital materials makes it possible to address student needs without regard to background or abilities. Ultimately, school librarians and classroom teachers can realistically fulfill the promise of finding the appropriate resources by collaboratively working together to select and create student materials.

Haughey and Muirhead (2005) indicated that object navigation, interface and input device interoperability, content size and density, hardware and infrastructure variability, and “connectivity (i.e., bandwidth) add to the challenges that designers have in creating materials that can be universally accessed and used.” Personalization and localization to meet individually specific needs compound the problems. Despite the difficulties, digital resources promote collaboration, active learning, multiple knowledge perspectives, and authentic materials and activities (McCormick, 2004).

Librarians as Technology and Collection Leaders

The leadership role of school librarians would mandate that they are the early adopters of technological change. Dianne Oberg states, “the key concepts of organizational culture and change have important implications for school library professionals, educators, and researchers” (2009, p. 9). Oberg continues, “The goal of the school library is to positively contribute to teaching and learning in the school” (p. 11). School librarians are uniquely positioned to provide content and pedagogical support to the teaching staff in schools.

The concept of instructional leadership emerged in the 1980s and typically is used to indicate the positional leadership of a school principal. With increased emphasis upon school accountability and national standards, instructional leadership is prioritized as an element of effective schools. A new definition of instructional leadership shifts the emphasis from that of a positional leader to “leading learning communities, in which staff members meet on a regular basis to discuss their work, collaborate to solve problems, reflect on their jobs, and take responsibility for what students learn” (Jenkins, 2009, p. 36). School librarians, through unique training and experiences, are prepared to interact with students and adults to achieve the promises and opportunities of classroom technological innovations.

Technology rich classrooms present a challenge to classroom teachers and librarians alike. Implementing change requires enhancements to the collection as well as communicating the changes to the entire school. Librarians are equally involved in negotiating personal change while promoting technology adoption through collaborations with colleagues. In addition to providing support to faculty in locating digital learning objects, librarians can enhance their own instructional practice. Hoffman and Mardis (2008) found the librarians’ role was essential to working with learners and educators in “digitally-centered” (p. 8) environments.

School librarians are the leaders in making informed selection choices for materials and other resources needed by students and teachers. Working within a strong collaborative position of “informed change agent, leader, and resource guide”(Callison, 2009, p. 203), the school librarian shifts “the collection process away from inputs and outputs to higher levels of outcomes of higher student achievement” (Callison, 2009, p. 203). The American Association of School Librarians (AASL) (AASL, 1998, 2007, 2009, 2010) and other national professional organizations (NBPTS, 2010; ISTE, 2010) support the leadership role of library media specialists.
in promoting activities that engage students and encourage the development of lifelong learning.

**Transformative Leadership**

Emerging trends in school librarianship bolstered by the focus on accountability and student achievement suggest that the principal as the lone instructional leader is inadequate. Research (e.g., Marsh, 2000; Blasé & Blasé, 1999; Terry, 1999; Gardner, 2000) “point[s] to an increased leadership role for teachers in schools” (McCay, Flora, Hamilton, & Riley, 2001, p. 135), but investigations of instructional leadership have indicated that teacher leadership and administrative leadership differ in “that administrative leadership is primarily managerial, while the emphasis in teacher leadership is more collegial” (McCay et al., 2001, p. 136).

Non-classroom based teacher leaders exhibited variations in leadership roles relative to tasks as mentors, models, and quasi-administrators. Classroom based teachers viewed leadership in terms of paper handling, meeting facilitation, and encouraging team discussion participation. The collaborative skills, knowledge of curriculum, and instructional enhancement, of the well-trained school librarian are components of transformational empowerment. While collaborative leadership is challenging, it is beneficial. Engagement “in such collaborative and collegial interactions with their peers” (McCay et al., 2001, p. 137) inspires change and movement toward superior professionalism.

When individuals unselfishly bring about change by looking "beyond their personal needs and strive to achieve goals that are important to an organization as a whole" (Smith, 2011, p. 4) they are exhibiting transformational leadership behaviors. Transformational leadership is particularly suited to organizational change. The benefits of transformational leadership to organizations include collaboration, commitment to achievement, positive risk taking, and motivated achievement (Smith, 2011). As schools experience radical changes, librarians are equipped to assume a transformational leadership role.

Teacher preparation programs seldom prepare classroom teachers to assume leadership roles (Danielson, 2007). The specialized training school librarians receive prepares them “to exert leadership in support of educational innovations” (McCay et al., 2001, p. 137) organized around the four librarians’ roles of teacher, instructional partner, program administrator, and, key to this paper, information specialist.

The utilization of technology both as resource within the library and as an instructional strategy in collaboration with teachers necessitates the use of transformative leadership on the part the school librarian. Transformative leadership empowers informal leaders to become involved in whole school change. The positional leader, traditionally the principal, is relieved of the burden of "the entire weight of a school reform and distributes some of the leadership roles to others to share the vision of the change" (Smith, 2012). As the school-based professional who curates the learning resource collection within and beyond the library, school librarians affect every stakeholder and play a key role on school change.

**Key Literature Findings**

School library collections are a support mechanism for teachers and students. The role of school librarians and the content of school collections are changing as a result of the proliferation of
technology and the increase in digital information. In the decades following the expansion of technology into schools, “selecting and providing access to digital resources are no longer novel responsibilities” [for school librarians], though they remain challenging” (Johnson, 2009, p. vii). Johnson (2009) further posited that collection development is “intertwined with all library activities and woven throughout the work librarians do” (p. vii). Johnson went so far as to contend that collection development is the “meat and potatoes of libraries” (p. ix) and that libraries cannot exist without collections. Resources in digital format and internet accessibility are powerfully changing “the work of collection development” (Johnson, 2009, p. x).

In an effort to match library resources with user needs and preferences, school library collections are becoming increasingly digital. Technology is an integral part of the entire learning process in the school library. Technology and technology skills are fundamental parts of a high quality education (U.S. DOE, 2010) and the availability of digital resources can complement school library print collections. The systematic and structured incorporation of digital resources in the school library collection is important to facilitate their use by students and simultaneous usage for large groups, constant access, and portability (Kay & Knaack, 2009).

Conclusions
The recent boom in technology and Internet resources has given rise to digital learning. Available digital resources can complement school library collections. In the ever-changing landscape of learning environments, collection development must expand beyond print resources to include the vast array of media delivered through a variety of technology-mediated modes. Numerous media and technology resources require the highly specialized expertise of the school librarian to “keep students and teachers abreast of how to use technology for education, how to find information, and how to distinguish such information from the good, bad and ugly” (Pascopella, 2002, p. 40). Both the library and the school librarian are evolving into unique roles relative to school reform and student achievement. The utilization of technology both as a practice within the library and as an instructional strategy in collaboration with teachers necessitates the use of transformational leadership.

The traditional librarian roles of locating, collecting, organizing, and disseminating information is strengthened when these skills are applied to digital learning objects and professional visibility and relevance to the school are enhanced as well. This very traditional aspect of school librarianship demands technology integration leadership in order to expose children to the learning modes and resources they need to become 21st century learners. The promotion of digital resources includes informing students, faculty and parents of the availability, as well as providing instruction on use. Promoting and using digital resources enables librarians to play “a vital role in the use and adoption of learning objects by faculty” (Shank, 2003, p. 194).

References


Drucker, P. (1968). The age of discontinuity: Guidelines to our changing society. New York,


Pascopella, A. (2002). Today’s media specialist: Trading in their traditional stereotypes for computer know-how and research skills, media center specialists are working hard to steer students to success. *District Administration, 38*(1), 40-44.


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