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*Competencies Needed to Provide Teen Library Services of the Future: A Survey of Professionals in Learning Labs and Makerspaces

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Abstract

Libraries are developing transformative teen-centered spaces and services to facilitate informal learning, creation, socialization, and community engagement. For sustained success, it is crucial that qualified professionals staff these learning spaces. This study explored the following research question: What are the competencies required for professionals to provide teens with resources and services in informal learning spaces such as Learning Labs or Makerspaces? Survey results of professionals working in Makerspaces or Learning Labs in libraries in the United States are presented. Findings relate to (1) the participants' job responsibilities and competencies necessary to work in a Makerspace or Learning Lab; (2) their perceptions of the value of their higher-education experiences; and (3) choices of resources for learning competencies. The findings inform professionals working with teens about necessary competencies; provide library directors and managers with a research-based framework on staff recruitment and training; and offer suggestions for curricular updates to library and information science (LIS) educators.

Introduction

Teen services librarians perform a range of tasks, such as collection development, programming, administration, reference, instruction, readers' advisory, outreach, and more. Teen services librarianship in the twenty-first century combines many of the core traditional tasks, but also addresses a shift in contemporary society that reflects increased diversity in teen demographics, teens' pervasive use of technology, and critical skills required for teens to succeed in school and in life. *The Future of Library Services for and with Teens* report by the Young Adult Library Services Association (YALSA) asserts that "libraries must leverage new technologies and become kitchens for 'mixing resources' in order to empower teens to build skills, develop understanding, create and share, and overcome adversity."[i] Over the past few years, an increasing number of libraries have developed transformative teen spaces and services that are

designed to facilitate informal learning, creation, socialization, and community engagement, which embody the image of a kitchen for mixing resources.

These innovative teen spaces are called by different names, such as Learning Labs, Makerspaces, Learning Commons, Hackerspaces, Fab Labs, or Studios. Each space and program might have a different vision and focus based on the needs and resources of the community in which they are embedded. They all, however, share common elements, placing teens at the center of their program. Teens are invited to discover their own passion and interests, facilitated by interactions with supportive mentors and peers, a range of technologies and digital media, and creative hands-on programs.

Learning Labs, dedicated teen spaces in libraries and museums, are grounded in the research-based frameworks called HOMAGO and Connected Learning.[ii] HOMAGO refers to "Hanging Out, Messing Around, and Geeking Out," the stages of self-directed learning or different levels of youth engagement in digital media. The principles of Connected Learning suggest that young people learn best when they pursue a personal interest or passion, with support from adults and peers, and when they can link their interest to academic or career success or to civic engagement.[iii] Makerspaces offer access to equipment and fabrication technologies, which allow people to not only design their ideas digitally, but to turn those ideas into real objects.[iv] Makerspaces tend to focus on physical objects, DIY (do-it-yourself), invention, and engineering approaches. The Maker program is a type of student-centered, project-based learning that stems from the pedagogical tradition of learning by making and through apprenticeship. Activities vary from skill-building projects to independent long-term projects.

In order for these informal learning spaces to be sustainable and expanded, it is crucial that qualified professionals staff them. Because these are new services and resources, there is a need to understand which competencies—skills, knowledge, abilities, or personal attributes—are necessary for teen services librarians working in these spaces. This paper aims to promote a discussion on how to support librarians so they can obtain and further develop competencies needed to work in emerging informal learning spaces for teens. The presented research seeks to answer the following overarching research question: What are the competencies required for professionals to provide teens with resources and services in informal learning spaces such as Learning Labs or Makerspaces?

The project consisted of two phases: Phase 1: in-depth interviews, and Phase 2: an online survey. This paper reports the results of Phase 2, which was conducted between October 2014 and March 2015, and focuses on findings from individuals working in libraries. The findings provide information for professionals working with teens about what competencies they might want to develop, or improve, in order to provide relevant library services that appeal to today's youth. Library directors and managers may take away a research-based framework on staff recruitment and training. The study also informs library and information science (LIS) educators on how to update the current youth services curriculum to best prepare future professionals working with teens.

Literature Review

This section reviews existing literature that addresses personnel in Learning Labs and Makerspaces (roles and staffing), issues about teen services librarianship in the twenty-first century, and existing competencies for librarians.

Personnel in Learning Labs and Makerspaces

Professionals are integral to Learning Labs and Makerspaces, whether they are called librarians, mentors, guides, volunteers, or staff. Existing literature—mainly reports from professional organizations instead of research-based work—provides useful guidelines regarding the role of mentors as well as staffing in Learning Labs and Makerspaces. Mentors in these informal learning spaces are essentially people who work with youth to facilitate learning and making and who may be experienced in one or more forms of making. They "help teens to identify new interests, encourage them to expand their horizons, and offer them access to expertise and resources."[v] The Young Makers Program's *Maker Club Playbook* report explains the role of mentors:

> The role of a Young Maker mentor is to help [young Makers] find a *project vision* if they don't already have one, and then to help them realize that vision. . . . Along the way, we encourage mentors to exploit the *teachable moments* that naturally occur during making to expose the underlying math, science, and engineering principles involved. But they aren't teachers so much as guides. We also expect mentors to pass on their knowledge of proper *tool usage and safety.* Finally, an important role for mentors is to demonstrate to Young Makers the importance of failure as a mean to success. That is, to expect and embrace failure as a normal part of the making process.[vi]

The *Mentor Handbook* of the Intel Computer Clubhouse Network, which serves as one model for the Makerspace, explains mentors typically serve as a guide, resource, role model, active participant, and catalyst; but mentors should *not* be a know-it-all, dominant authority figure (e.g., schoolteacher, the law, parent), cool peer, therapist/counselor, gift giver, or disciplinarian. The handbook offer strategies and tips for mentors, including the following: be reliable and consistent, make every member feel that they are important, be relaxed and be yourself, be enthusiastic, go with the flow, be approachable, don't be a director, have fun, and more.[vii]

In a library Makerspace or Learning Lab, mentors are not limited to teen librarians; libraries draw on assets in their communities to recruit mentors. Community members, parents and other family members, and, more importantly, teens themselves support other teens' making and learning. A successful example includes the Makers-in-Residence programs (also called Artist-in-Residence programs), in which Makerspaces invite community members with different types of expertise—such as artists, engineers, makers, writers, craftspeople, video makers, comedians, musicians, visual artists, and designers—to use their space, facilitate sessions, and interact with other makers. Utilizing the help of available parents and extended family is also beneficial because "not only are most parents and guardians deeply invested in seeing children grow and learn, inviting them to help gives them an opportunity to spend time making as a family, while sharing their own knowledge and skills."[viii] Last but not least, teens themselves serve as mentors

for other teens; an increasing number of Makerspaces are providing programs to train teens to become mentors for younger children.[ix]

Future of Teen Services in Libraries

In 2013 youth services faculty members from different library and information science (LIS) schools shared their thoughts on the future direction of LIS education for youth services librarianship.[x] They discussed how LIS education needs to adapt to prepare youth librarians to engage with today's teens. Several key issues were addressed, including (1) fostering a user-centered approach instead of a focus on resources; (2) covering a range of resources beyond books and including digital media; (3) addressing diversity and inclusion; (4) being more cross-disciplinary by bringing expertise from other fields; (5) incorporating evidence-based practices and design-based research; and (6) facilitating informal learning.

YALSA's *Future of Library Services for and with Teens* addresses a paradigm shift for libraries and teen services, including the shift as seen through teen use of technology, expanded literacies, Connected Learning, and the social and economic factors impacting teens. In particular, the report explains the paradigm shift in staff. The historical practice was that when libraries have teen services librarians, they are viewed as the only staff who are expected to interact with teens. On the other hand, the envisioned future for teen services includes a hybrid of degreed library professionals, staff, and skilled volunteers "who act as mentors, coaches, and connectors to the information and resources needed by individual teens in the community. Library staff, mentors, and coaches build relationships with teens with the goal of supporting their academic, career, and civic engagement and growth."[xi] The report suggests five fundamental changes/shifts in teen services librarianship, including (1) embracing youth services librarians' role as facilitators rather than experts, (2) refocusing beyond traditional roles and measurements of success, (3) partnering strategically to reach beyond the library's walls, (4) creating a whole-library and whole-school approach to serving teens in physical spaces and online, and (5) supporting library staff in gaining new skills.

Current Competencies for Librarians

The American Library Association (ALA) developed core competences of librarianship in 2009.[xii] The core competences statement defines the knowledge that all persons graduating from ALA-accredited master's programs in library and information studies should know and be able to employ, where appropriate, in the areas of (1) foundations of the profession, (2) information resources, (3) organization of recorded knowledge and information, (4) technological knowledge and skills, (5) reference and user services, (6) research, (7) continuing education and lifelong learning, and (8) administration and management.

There are also competencies statements developed by relevant professional organizations to support specialized learning experiences. Competencies statements that are most relevant to teen services include "YALSA's Competencies for Librarians Serving Youth: Young Adults Deserve the Best"[xiii] and "ALA/AASL [American Association of School Librarians] Standards for Initial Preparation of School Librarians" developed in 2010.[xiv] YALSA's "Competencies for Librarians Serving Youth" defines the knowledge and skills that individuals must demonstrate to provide quality library services for and with teens in the areas of (1) leadership and professionalism, (2) knowledge of the client group, (3) communication, marketing, and outreach, (4) administration,

(5) knowledge of materials, (6) access to information, and (7) services. The ALA/AASL Standards identify five standards for those who develop and manage library and information services in a Pre-K–12 setting, including (1) teaching for learning, (2) literacy and reading, (3) information and knowledge, (4) advocacy and leadership, and (5) program management and administration. In addition, YALSA published "Core Professional Values for the Teen Services Profession," which defines nine core values for those who work for and with teens through libraries. Not intended to replace the existing competencies, these values are "fundamental underlying principles that guide the decisions, actions, and behaviors of library staff working with and for teens" and provide indicators for practices that resonate with each value. The nine values include (1) accountability, (2) collaboration, (3) compassion, (4) excellence, (5) inclusion, (6) innovation, (7) integrity, (8) professional duty, and (9) social responsibility.[xv]

Methods

I. Research Design

This article reports the findings from Phase 2 of a study to determine the competencies needed by information professionals in Makerspaces or Learning Labs in U.S. libraries and museums. Phase 1 of the study, the analysis of a series of in-depth interviews with professionals in Learning Labs and Makerspaces, was presented in earlier articles.[xvi] This article reports findings from the online survey conducted in Phase 2, focusing on the following research question: What are the competencies required for information professionals to provide resources and services in library and museum learning spaces called Learning Labs or Makerspaces?

II. Participant Recruitment

The study used the purposive sampling approach of selecting information-rich participants who could provide an in-depth understanding on the study topic.[xvii] The inclusion criteria are full-time or part-time professionals working in a physical space of Learning Lab or Makerspace in a library or museum. To participate in the survey, the Learning Lab or Makerspace must provide services or programs for youth under age eighteen. The researchers exempted any library or museum from the sample if they had participated in the Phase 1 interviews.

To develop the sample, the researchers compiled a census of library and museum websites that listed either a Makerspace, Learning Lab, or both. This census was developed by reviewing publicly available resources such as the YOUmedia Network and the directory of Makerspaces. Researchers also reviewed public library and museum websites to determine which mentioned having a Makerspace or Learning Lab. Researchers also sent messages out to listservs and Google Plus Communities for Learning Labs/Makerspaces professionals. An effort was made to include professionals from libraries (the sample included public and school libraries and an "Other" category) and museums, and to include both Learning Labs and Makerspaces.

Potential survey participants were invited via an e-mail to persons identified on the library website as working in the Makerspace or Learning Lab and to appropriate listservs and Google Plus Communities.

A total of 58 professionals from libraries and museums completed the online questionnaire. Forty-four (44) of these participants were from libraries. This paper will report the findings

related to libraries and will not include data from museum participants in the analysis. The opening screen of the questionnaire contained an IRB-approved information sheet, which provided an overview of the study and contact information for the researchers. At the time of the study, all participants lived in the United States and were English speakers.

III. Data Collection

An online survey was conducted using Qualtrix software. The survey was open to participants between October 2014 and March 2015. Survey questions addressed learning space professionals' perspectives on competencies and skills that they felt were necessary to work in a Learning Lab or Makerspace. The questions also asked participants about their primary job responsibilities and whether or not they felt prepared to perform these. Further, participants were also asked about their educational preparation for working in these emerging learning spaces, and what resources they would use to obtain new competencies and skills required in their current position.

IV. Data Analysis

The data included the completed surveys from the 44 library participants. However, the completion rate varied between as low as 40 responses to a high of 44 responses for some questions. As a result, the totals in some of the tables will not equal 44 responses. Reports were generated using the Qualtrix report feature and exported into Excel or Word files for further analysis. Due to the small sample size, only descriptive statistics were used to analyze the data.

V. Demographics of Libraries

Twenty-one states were represented in the sample of participating libraries. Illinois and Colorado included the most participants, with Illinois providing 11% of the sample and Colorado with 9%. See table 1 for a list of all participant states.

Table 1. States Participating in Survey

States	Number of participants/per state
IL	5
CO	4
MT, NJ, NY, OK	3
AZ, CA, GA, MA, MO, NV, OH, TN	2
KS, MN, NC, UT, VA, WA, WI	1
Total	44 (in 21 states)

Overwhelmingly, public libraries represented the highest percentage of participating libraries with 82% of the total sample, compared to 11% in school libraries and 7% in "Other." The "Other" category included three participants from academic libraries. See table 2 for totals for each type of library.

Table 2. Type of Library

Organizations	Number of participants
Public Library	36

School Library	5
Other	3
Total	44

The service populations of the libraries also varied. Participants were mostly from service populations of 50,000–99,000 (23%), followed by 250,000–490,000 and 500,000 and higher with equal participants (16%), and with smaller service populations, such as 25,000–49,999, as the third highest representation (11%). See table 3 for participants by service population.

Table 3. Service Population

Service population	Number of participants
Less than 1,000	2
1,000–2,499	2
2,500–4,999	1
5,000–9,999	2
10,000–24,999	4
25,000–49,999	5
50,000–99,999	10
100,000–249,999	3
250,000–499,999	7
500,000+	7
Not sure/don't know	1
Total	44

Participants reported having either a Learning Lab (18%) or Makerspace (45%). Eleven percent reported having both of these learning environments, and 25% of participants reported not differentiating between the two types of learning spaces, as shown in table 4.

Table 4. Types of Learning Space

Spaces	Number of participants
Learning Labs	8
Makerspaces	20
Both	5
Do Not Differentiate	11
Total	44

In terms of how long each has been offering their Learning Lab or Makerspace programs, 59% reported offering programs between 1 to 3 years, 30% less than one year, and 11% more than 3 years, as reported in table 5.

Table 5. Years Programs Offered

Spaces	Number of participants
Less than 1 year	13
1–3 years	26
More than 3 years	5
Total	44

VI. Demographics of Participants

The age, gender, ethnicity, education, professional experience, and experience working with teens were gathered from each survey respondent and are presented in tables 6 through 13. We also asked participants to identify their position in the library. Forty-two percent identified as being librarians, 37% as managers, and 21% as library staff members.

Table 6. Participant Position

Position	Number of participants [vi]
Manager in library	16
Librarian	18
Library staff	9

[vi] **Note:** Column totals 43 since one participant did not answer this question.

We also asked participants to identify their age, gender, ethnicity, highest degree of education, discipline for their degree, years of professional experience, and experience working with teens.

Table 7. Participant Age

Age	Number of participants [vii]
25 and under	4
26–34	15
35–44	15
45–54	4
55–64	4
65 and older	1

[vii] **Note:** Column totals 43 since one participant did not answer this question.

The majority of the participants reported being between 26 and 44 years of age (each category at 35%), followed by an equal amount of 25 and under, 45–54 years of age, and 55–64 (each at 9%). Only 2% reported being 65 years or older.

Table 8. Participant Gender

Gender	Number of participants*
Female	30
Male	13

***Note:** Column totals 43 since one participant did not answer this question.

The majority of the participants (70%) were female, and 30% were males.

Table 9. Participant Ethnicity

Ethnicity	Number of participants
White	38
Hispanic or Latino	0
Black or African American	1
Native American or American Indian	0
Asian/Pacific Islander	2
Other	2

As you can see from table 9, the overwhelming majority, or 88% of the participants, reported as being White. Five percent were Asian/Pacific Islander or Other. Only 2% reported as being Black or African American ethnicity. Zero percent were from Hispanic or Latino or Native American/American Indian descent. While it is important to note this disparity in ethnic identification of information professionals who work in Makerspaces or Learning Labs in the study's sample, it is not possible to extend this finding to the entire population of information professionals who work in these emerging learning spaces.

Table 10. Participant Education

Highest degree	Number of participants[i]
Bachelor's	7
Master's	34
PhD	0
Other	2

[i]**Note:** Column totals 43 since one participant did not answer this question.

The majority of participants (79%) had a master's degree. Only 16% had a bachelor's degree, and 5% reported having some other level of degree such as a high school diploma or associate's degree.

Table 11. Education Disciplines

Disciplines	Number of participants[ii]
Library and Information Science	28
Education	3
Art/Architecture/History	3
Computer Science	2
English	2
Other	12

[ii]**Note:** Column totals 50 several participants provided more than one answer to this question.

The disciplines for the degrees also varied. The majority of the participants (63%) reported having an MLIS or information science degree, followed by education or a BA in art and architecture or history. Only two participants reported having a degree in computer science, and few reported more creative degrees like graphic design, theater, or digital communication. The "Other" category, each with one response, included chemistry, classics, anthropology, graphic design, communication, journalism, political science, history, philosophy, theater, and digital communication. Some participants held dual masters degrees and still others reported both their undergraduate and graduate degrees in the response.

Table 12. Professional Experience

Years of experience	Number of participants[III]
Less than a year	7
1–3 years	7
4–9 years	18
10–20 years	10
More than 20 years	1

[III]**Note:** Column totals 43 since one participant did not answer this question.

Participants' years of professional practice varied from 42% having 4–9 years in practice, followed by those with 10–20 years at 23%, and less than 1 year to 1–3 years at equal numbers (16%). Only 2% of the sample had more than 20 years of experience.

Table 13. Experience with Teens

Years of experience	Number of participants [IV]
Less than 1 year	7
1–3 years	15
4–9 years	12
10–20 years	6
More than 20 years	1

[IV]**Note:** Column totals 41 since three participants did not answer this question.

Participants' experience with teens also varied, with the highest percentage of participants having 1–3 years of experience working with teens, followed by 4–9 years.

Findings

This study generated findings related to the participants' job responsibilities and competencies that they reported as being necessary to work in a Makerspace or Learning Lab, including snapshots of competencies as viewed by each participant group (managers, librarians, and library staff). Also included are their perceptions of the value of their higher-education experience and how each of these factors prepared them to work in a Learning Lab or Makerspace. Choices of resources for learning competencies they may not already possess are also reported.

Job Responsibilities of Participants

Participants were asked to list the top three job responsibilities of their current position. The top five job responsibilities reported by all participants included (1) management, (2)

teaching/programming, (3) user services, (4) advocacy and partnerships, and (5) collection development. Management included responsibilities related to management of a department or of the Learning Lab or Makerspace; maintaining the physical building; supervising staff, interns, or volunteers and programs; serving as liaison to IT vendors; and purchasing and budgeting. Teaching/programming responses included developing, planning, and delivering programs and teaching specific classes on technologies for making such as 3D printers and multimedia. User services responsibilities included customer service and reference desk duty, helping teens with equipment in the Learning Lab or Makerspace, and troubleshooting technologies. Advocacy and partnerships responses related to advocating for the Learning Lab or Makerspace, establishing partnerships with community organizations, and outreach to the community through marketing of the learning space. Finally, collection development included selecting and purchasing materials and technology for the Learning Lab or Makerspace.

Table 14. Top Five Primary Job Responsibilities

Job Responsibility
1. Management
2. Teaching/programming
3. User services
4. Advocacy and partnerships
5. Collection development

Competencies

As noted above, the objective of the study was to determine which competencies information professionals who work in Learning Labs or Makerspaces perceive as the most important to their success. The study adopted McNeil and Giesecke's definition of competencies, which are defined as "the skills, technical knowledge, and personal attributes that contribute to an individual's success in a particular position."[xviii] The findings present first the top competencies as reported by *all* categories of participants, including managers, librarians, and staff, in table 15, and then as reported by each individual category of participant, in tables 16–18.

The top ten competencies reported by all groups of participants, in order of frequency, are (1) technology, (2a) teaching/programming, (2b) learning, (3) community advocacy and partnerships, (4) flexibility/adaptability, (5) understanding diverse users, (6) management, (7) communication skills, (8) curiosity, (9) creativity, (10a) patience, and (10b) subject content knowledge and skills. Duplicated ranks (a & b) indicate that these competencies had the same number of responses in the data. The competencies that are not self-explanatory are explained further in the following section. Curiosity, creativity, and patience are competencies that are self-explanatory, and the survey data provided no further accounts about the items.

Technology

The top competency reported by all groups of participants was related to technology—that is, possessing the ability to work with technology, having an interest in or comfort with technology, and being able to teach and learn technology. Also noted were having a basic knowledge of

technology in general and some basic technology skills such as coding, video/audio/photo editing, using touch screens and both computer platforms (PC and Mac), and some facility with graphic design. One participant said, "The person must be willing to learn and [be] flexible. . . . They do not need to come with technology skills."

Teaching/Programming

The second highest reported competency was teaching/programming. This competency includes the ability to design instructional programs and sessions and to facilitate informal learning. Also important is the ability to involve others in the learning process, to guide projects without doing them for the teens, to provide open-ended programming, to facilitate hands-on learning, and to teach necessary technology.

Learning

Another second highest competency is related to the individual information professional's willingness or ability to learn. Information professionals should possess a willingness, desire, and enthusiasm for learning. They should be self-directed, lifelong learners who know how to learn. They should also possess the ability to learn technology and to follow instructions/directions.

Community Advocacy and Partnerships

An information professional's ability to serve as an advocate for the learning space and to network and build relationships with community partners or mentors was the third most frequently reported competency. Possessing the ability to develop relationships with community partners and to market the learning space through public outreach activities are important. Grant writing as a means to sustain the learning space was also noted. One participant said that an information professional needed the "ability to work with the community since a successful makerspace is very community-oriented."

Flexibility/Adaptability

Being flexible and able to adapt to the changing situations and environments often experienced in a Makerspace or Learning Lab was reported as the fourth highest competency that professionals thought was important to work in these emerging learning spaces. Due to the ever-changing learning opportunities provided by a wide range of mentors, a professional has to be open to change and be flexible and adaptable in their approaches to working with teens.

Understanding Diverse Users

Skills and knowledge of the user-centered approach was reported as the fifth most important competency. Possessing an understanding or awareness of the needs of their patrons or target audience (teens), as well as experience working with the public were all mentioned. One participant noted the importance of traditional library skills, such as "reference interaction skills [or] the ability to figure out what the patron *really* needs" as an essential component of this competency. The ability to work with diverse user groups, such as cultural competencies, emerged as an essential component of this competency because professionals in these learning

spaces serve people with diverse backgrounds (e.g., different socioeconomic status, ethnicity, age, learning styles, and technology abilities).

Management

Professionals in Makerspaces and Learning Labs manage the spaces and the people who work with the teens, including the librarians, staff, mentors, volunteers, and anyone who provides programming. They also manage the selection and purchase of technology for the space, budgeting, and writing grants to sustain the Makerspace or Learning Lab. These different aspects of management were the sixth most frequently mentioned competency.

Communication Skills

The seventh most frequently reported competency was communication skills. Effective communication with a range of different people such as mentors, community members, potential partners, parents, IT staff, and the teens themselves is an essential competency in a Makerspace or Learning Lab. Professionals need to be proficient in multiple forms of communication, from giving presentations, using social media to advocate for the learning space, or to serve as liaison to various stakeholders and partners.

Subject Content Knowledge/Skills

Possessing specialized subject knowledge and skills benefit professionals working in these learning environments. Having subject knowledge of art, science, or computer science, or familiarity with the Maker concept and philosophy were listed as the tenth most important subject content areas that professionals should possess. See table 15 for top competencies reported by all categories.

Table 15. Top Competencies Reported by All Categories[v]

Competency
1. Technology
2a. Teaching/programming
2b. Learning
3. Community advocacy and partnerships
4. Flexibility/adaptability
5. Understanding diverse users
6. Management
7. Communication skills
8. Curiosity
9. Creativity
10a. Patience
10b. Subject content knowledge/skills

[v]Numbers duplicated on table 15 indicate that these competencies received the same number of responses.

Snapshots of Competencies Reported by Participant Groups

To further understand the competencies that participants thought were necessary to succeed, the researchers separated the analysis by different participant groups: managers, librarians, and staff. The findings from each group are explained below.

The competencies listed by managers mostly match those reported by all categories of participants, except for order of ranking. For example, learning, which was ranked as third for managers, ranked as second for all participants. Community advocacy and partnerships were ranked as second for managers and third for all participants. Another exception is that management skills, ranked as fifth for managers, was ranked as sixth by all participants.

Table 16. Top Competencies Reported by Managers

Competency
1a. Technology
1b. Teaching/programming
2. Community advocacy and partnerships
3. Learning
4. Flexibility/adaptability
5. Management skills

There are some definite differences between the librarians' perceptions of most important competencies and those of all participant groups. For example, understanding diverse users and communication skills were ranked higher by this group than flexibility/adaptability or community advocacy. Technology skills and knowledge about appropriate technologies to use are key to this group. Teaching and being able to facilitate programs and informal learning experiences are also very important. Communication skills and understanding diverse users, including the ability to work with young adults from diverse backgrounds, were ranked third by librarians. Flexibility/adaptability was seen as more important by librarians than other competencies such as community advocacy and partnerships.

Table 17. Top Competencies Reported by Librarians

Competency
1. Technology
2a. Teaching/programming
2b. Learning
3a. Understanding diverse users
3b. Communication skills
4. Flexibility/adaptability
5. Community advocacy and partnerships

When the top competencies reported by staff of Makerspaces and Learning Labs are reviewed, quite a different picture emerges. Technology and learning remained the top two competencies, as in all participant groups. Dominant staff responses focused on possessing specific technology

skills and a willingness to learn new technologies. However, one difference seen is that curiosity and communication skills (both ranked as third, along with community advocacy and partnerships, in this participant group) are considered very important to staff. Teaching was ranked fourth by library staff, but it was ranked as the second most important competency by all participants. Creativity, ranked as fifth for staff, was ranked lower, eighth for all participants.

Table 18. Top Competences Reported by Staff

Competency
1. Technology
2. Learning
3a. Curiosity
3b. Communication skills
3c. Community advocacy and partnerships
4. Teaching/programming
5. Creativity

Competencies That Participants Did Not Possess

Participants were also asked if they were ever asked to perform a task or to do something for which they did not feel prepared. The majority of participants or 74% ($N = 31$) reported yes to this question. The competencies that participants felt that they did not possess are listed in table 19.

Table 19. Competency that Participants Did Not Possess

Competency	Number of Participants	Response
New technologies and Making tools	15	48%
Others	11	35%
Obtaining funding	7	23%
Advocacy	7	23%
Skills to facilitate learning	7	23%
Science content knowledge	6	19%
Knowledge on user behavior and how people learn	6	19%
Management	4	13%

Forty-eight percent of all participants who responded "Yes" that they had been asked to perform a task they did not feel they possessed the knowledge or skills for, reported the use of new technologies and Making tools as the competency they did not possess, followed by the 35% who reported "Others," which included (1) publicity, developing press releases and marketing using social media; (2) specific programs; (3) tech skills, computer programming, and learning software; (4) instructing others on topics they did not know (e.g., business and coding/programming); and (5) changing technologies and social media. Participants listed these "Other" items if they felt that the competency they were lacking did not fit into one of the predefined categories. Even though some of the entries do appear to overlap with the categories,

we are reporting the "Other" entries as entered by the participants. Competencies related to obtaining funding, advocacy, or facilitating learning all ranked as third (at 23% each) in the competencies that participants felt they did not possess.

Educational Preparation for Current Position

Participants were asked whether they believed their higher education prepared them for working in their current position in either a Learning Lab or Makerspace. An overwhelming 64% of all participants reported that their educational preparation was somewhat relevant, followed by 14% who believed it was not relevant at all, and 12%, who viewed it as relevant. Only 10% reported that it was very relevant to their current position.

Table 20. Relevance of Educational Preparation for Current Position

Competency	Number of Participants	Response
Not at all relevant	6	14%
Somewhat relevant	27	64%
Relevant	5	12%
Very Relevant	4	10%

Competencies Acquired or Not Acquired from Higher Education

Further analysis of the data about the relevance of all participants' educational preparation revealed that the most relevant competencies participants learned through higher education related to their current position. These included the following:

1. Information systems and technology
2. User services
3. Youth development/learning styles
4. Management
5. Problem-solving skills
6. Flexibility/adaptability

Analysis also showed that the most frequently reported competencies participants felt that they did *not* learn from higher education that are relevant to their current position were as follows:

1. New technologies and Making tools
2. Makerspaces
3. Management
4. Teaching and programming
5. Community advocacy and partnerships

Resources to Learn New Competencies and Skills

Participants were also asked to choose all resources they would use to obtain new competencies in order to be successful in their current position. They overwhelmingly reported learning on the

job (90%), followed by learning on their own using online tools or other resources such as Lynda.com (88%), and by networking with other professionals (81%). They also chose grant-sponsored forums and activities (48%), and then formal education (40%) (see table 21).

Table 21. Resources to Learn New Competencies and Skills

Resource	Number of Participants	Response
Learn on the job	38	90%
Learn on own using online tools	37	88%
Networking with other professionals	34	81%
Grant-sponsored forums/activities	20	48%
School (formal education)	17	40%
Others	7	17%

Other resources they reported included (1) courses in relevant technology; (2) hiring experts to offer professional development; (3) learning from others through informal meet-ups; (4) employers providing time at work to research/practice skills/software; and (5) webinars.

Discussion

Responsibilities and Competencies in Library Informal Learning Spaces

This study revealed primary job responsibilities that professionals perform in library Makerspaces and Learning Labs as well as competencies they need to serve today's teens successfully in these informal learning spaces. Major job responsibilities include (1) management, (2) teaching and programming, (3) user services, (4) advocacy and partnerships, and (5) collection development. The survey results also suggest that the top needed competencies are skills, knowledge, and personal attitudes in relation to (1) technology, (2a) teaching/programming, (2b) learning, (3) community advocacy and partnerships, (4) flexibility/adaptability, (5) understanding diverse users, (6) management, (7) communication skills, (8) curiosity, (9) creativity, (10a) patience, and (10b) subject content knowledge and skills.

Competencies That Professionals Perceive They Are Lacking

Among the needed competencies, taking a closer look at the competencies that professionals did not possess or did not learn from higher education reveals implications for professional development and pre-service librarian education. The most frequently reported competencies that participants said they did not learn from higher education fall into the areas of (1) contemporary technologies, (2) Makerspaces, (3) management, (4) community advocacy and partnerships, and (5) teaching and programming. These competencies are closely related to the tasks they did not feel prepared to do, such as (1) working with new technologies and Making tools, (2) advocacy, (3) obtaining funding, and (4) facilitating learning.

It is plausible that professionals did not learn or were not equipped with the competencies about new technologies and Making tools (such as 3D printers and laser cutters) or the concept of Makerspace in libraries, because the tools and concept did not exist when many of the participants attended higher education. Programming, advocacy/partnerships, and management are, however, subjects taught in LIS (library and information science) programs. Still,

participants report that they wish they had learned more about these areas. What does this mean? Certainly, along with classroom learning, professionals need practical and real-world experiences to become well versed in these areas. In addition, higher education must strive to teach those topics more relevant to the real world, cultivate students' ability to find connections between theory and practice challenge them to apply principles to real-world issues, and encourage internships and other hands-on experiences.

Certain aspects of management, advocacy, or programming have been changing or are more pronounced in these informal learning environments. For example, the importance of advocacy and partnerships is particularly emphasized in the survey responses; advocacy and partnerships ranked highly in the primary job responsibilities, top needed competencies, and the competencies that they did not possess. In order to maintain and grow these emerging spaces, professionals are called to serve as advocates for the new resources and services they provide and to convince others of the need and impact of the space in order to secure funding. Building partnerships with other agencies and community members has never been more critical as libraries transform into community learning centers. As a participant aptly indicated, a successful Learning Lab or Makerspace is grounded in the community that it serves and focuses on the needs and assets of the community. These learning spaces often invite community artists, makers, scientists, and family members to facilitate various sessions, which makes community involvement a critical element of the spaces. In addition, Connected Learning principles—a framework for designing Learning Labs for teens—suggest that Connected Learning environments are "designed around networks that link together institutions and groups across various sectors [and] learning is most resilient when it is linked and reinforced across settings of home, school, peer culture and community."[xix] Professionals working in an informal learning space in libraries, as a key player in the Connected Learning ecosystem, are urged to take an active approach to networking and building partnerships to support teens.

Several survey participants reported that they did not feel well prepared to teach and deliver programs in Makerspaces and Learning Labs. The data do not show whether or not individual participants had taken a programming class in their higher education. Even if they had learned about teaching and programing in higher education, participants might not feel that their coursework was relevant to their current practices. In any case, learning—especially informal learning—is an integral part in library Learning Labs and Makerspaces whether teens are just hanging out, socializing, or making something for fun. Facilitating informal learning, such as guiding open-ended sessions and hands-on learning without directing the sessions, is a set of skills articulated in this study. According to the *Youth MakerSpace Playbook*, mentors in these spaces are "a new kind of teacher," assuming the most powerful role of adults, who encourage, guide, share, but ultimately allow youth to develop processes and come to conclusions on their own accord. These are essential skills that professionals must have in order to invite, inspire, and potentiate young people in different learning/making situations, such as when a youth is frustrated with a particular challenge or having a hard time getting started, or when mentors would like to invite youth to a learning process or when they want to reinforce engagement and persistence.[xx]

Competencies Professionals Learned from Higher Education

On the other hand, a majority of survey participants (86%) reported that higher education was at least somewhat relevant in obtaining the needed competencies. The most frequently reported

competencies participants said they learned from higher education that are relevant to the current position include (1) information systems and technology, (2) user services, (3) youth development and learning styles, (4) management, (5) problem-solving skills, and (6) flexibility/adaptability. It is promising that competencies on information systems/technologies acquired from higher education are applicable to the participants' current job positions, even though technologies are constantly changing and contemporary Making tools did not exist when many of them attended higher education. Findings suggest the importance of cultivating pre-service or current professionals' interests in and comfort with technology and, more importantly, the ability to learn technologies, rather than focusing on teaching specific technology tools during higher education. The user-centered approach taught in LIS programs—such as serving diverse users based on their needs, developmental characteristics, and information behavior and learning styles—turns out to be valuable when professionals work in Makerspaces and Learning Labs.

It is notable that participants developed some of the key dispositions or personal attributes during their higher education, such as adaptability and problem-solving skills. Library learning spaces are and will be constantly changing, including technologies, and professionals are likely to be asked to perform new tasks that they do not feel prepared to do. A few survey participants commented that during their higher education they were consistently encouraged to expect and adapt to changes in technologies, trends, and community needs and expectations. They were taught to be continually learning, to be a self-starter, and to take initiative, which is a valuable asset in working in Makerspaces and Learning Labs.

Learning on the Job Continuously

While there are qualities that higher education can and must promote during a pre-service training period, the survey results indicate that a majority of the professionals continuously acquire competencies on the job. This is inevitable owing to the constantly changing nature of the space and the necessity of hands-on, experiential learning in practice. Professionals acquire needed competencies by learning on their own or through networking with other professionals in Learning Labs and Makerspaces. Existing networks—such as YOUmedia Network Community of Practice (community.youmedia.org) or Maker Ed's Resource Library (Makered.org/resources)—offer a forum for professionals to share ideas, experiences, resources, tools and materials, projects, and more.

Because professionals continue to grow after they are placed in an informal learning space, it is not surprising that the ability to learn is one of the top needed competencies. Four participants specifically indicated a need of having research skills, which could be part of their learning process, including "finding online and community resources" and "[the] ability to research and determine when to include new technology." In these learning spaces, inherently, professionals themselves need to be lifelong learners. The participants' job tasks/responsibilities, however, do not display much about learning; there was only one librarian who reported that one of his/her primary responsibilities is doing research. It would be desirable to allow professionals more time, support, and opportunities for learning and research as part of their job.

Diversity and Participant Demographics

One of the key competencies identified in this study is being able to understand diverse users. The communities that the professionals serve are diverse, and they must possess cultural competencies in order to work with teens from different backgrounds. The demographics of the professionals in this study, however, do not reflect the diversity of the communities they serve. The overwhelming majority (88%) of the participants were White, followed by Asian/Pacific Islander or Other (5%). Only 2% reported as being Black or African American ethnicity, and no participant reported as being of Hispanic or Latino or Native American/American Indian descent. Although these figures show a disparity in this study sample, which may not represent the entire population of professionals in Makerspaces and Learning Labs, at least within this study the finding suggests a need of having professionals from diverse backgrounds in library learning spaces.

Limitations

The result is an analysis of forty-four professionals who voluntarily participated in the survey. Findings in this study cannot be generalized, because the sample does not represent the entire Makerspaces or Learning Labs community. In addition, the findings are competencies that the survey participants perceive to be necessary and might not be a comprehensive list of all skills, knowledge, and attributes needed by professionals in Learning Labs and Makerspaces.

Conclusion

This study investigated competencies needed by professionals working with teens in library Makerspaces and Learning Labs. The research results revealed various skills, knowledge, and personal attributes that are needed to provide innovative services and resources in these emerging informal learning spaces. The findings suggest that library professionals must have technology and Making skills, know how to facilitate informal, hands-on learning, and be able to relate to teens from diverse backgrounds. They must be able to understand the needs and characteristics of individuals and to work with the community closely. Professionals also manage the space and a range of resources, as well as supervise staff and volunteers. Personal dispositions—such as flexibility and adaptability, curiosity, patience, creativity, problem-solving skills, and social skills—are also essential to becoming a successful professional in informal learning spaces. Although the study sample focused on professionals in Makerspaces and Learning Labs, all teen services librarians may find the competencies reported in this study relevant to their position because the mission of empowering teens as creative makers and supporting their Connected Learning experiences should not be limited to a certain library space.

Notes

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*Designing the Library of the Future for and with Teens: Librarians as the "Connector" in Connected Learning

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Abstract

Teen services librarians are well positioned to embrace connected learning principles in designing and implementing teen programs and services at their libraries. Due to the proliferation of participatory culture among teens, it is crucial that teen services librarians obtain teens' voices (especially from non-dominant teens) as they conceptualize, design, implement, and evaluate connected learning programs and services for teens. By illuminating the desired librarian-teen engagement practices in connected learning using Radical Change theory, this paper describes six cooperative inquiry techniques utilized by human-computer interaction scholars to co-design technologies and learning programs with children that can be adapted for designing library programs and services with and for teens. In addition to explaining these techniques, potential ways that these techniques can be used by teen services librarians are presented.

Introduction

The emergence of newer technologies (e.g., ubiquitous computing, mobile computing, wearable technologies) has led to a "participatory culture," challenging the notion that there are designated experts who produce knowledge while the public consumes this knowledge. Through participatory culture and leveraging the power of newer technologies that have revolutionized the speed and capabilities of knowledge production and dissemination, the public can now be problem-solvers and experts themselves regardless of their formal education and training.[i] This participatory culture has also transformed learning, particularly in skills that are needed to ensure productive participation, such as collaboration, self-direction, systems thinking, information literacy, and design thinking.[ii] The development of these skills among youth is challenging within the context of formal learning environments, such as schools, where learning is almost always in situ and normalized, whereas youth learn outside of school through interactions with their surroundings, community, peers, adults, and technology.[iii] Unfortunately, in school classrooms students are often restricted from using these newer technologies due to the demands of the school curriculum, testing pressures, time limitations, malfunctioning equipment, stringent firewalls, and school policies that consider these technologies a distraction.[iv] This results in a dichotomy that is often used in education and experienced by students themselves: the formal

(in-school) and informal (out-of-school) learning, which many scholars acknowledge as a problematic distinction but one that is commonly used.[v]

The connected learning framework developed by Ito and colleagues elegantly unites these informal and formal learning pursuits by articulating a vision for leveraging networked technologies to promote learning experiences that are academically oriented, peer-supported, and interest-driven, as well as production-centered, openly networked, and grounded in a shared purpose.[vi] This framework champions the use of emerging technologies to support connected learning by strengthening young people's access to knowledge and information, offering timely feedback and individualized and collaborative learning experiences, and linking youth to adult mentors who have expertise in an area of shared interest.

The *Future of Library Services for and with Teens* report calls for reimagining the position of libraries to promote the three spheres of learning (interest-driven, peer-supported, and academically-oriented) among non-dominant teens, as described in the connected learning model.[vii] Public libraries continue to be a place whereby non-dominant teens can feel comfortable and are encouraged to explore networked technologies.[viii] Non-dominant teens—who often come from low socioeconomic backgrounds, immigrant families, and minority groups—struggle to formulate the connections between these three spheres because access, literacy, and support from adult mentors are often lacking for them compared to their more privileged counterparts.[ix] Teen librarians need to know how to work with youth from non-dominant groups who need libraries the most.[x] To build teen services librarians' capacity to encourage connected learning among non-dominant teen groups, teen services librarians will need to offer programs and services that meet these teens where they are and inspire them to push their current boundaries of learning. Surveys, interviews, and forming a teen advisory council are no longer sufficient when designing teen programs. Instead, it is time to involve teens themselves as co-designers of programs and services. Teen services librarians need to apply interdisciplinary approaches to establish equal partnership and learning opportunities that facilitate discovery and use of digital media. Such approaches are informed by research, methods, and best practices in disciplines outside of library and information science.[xi]

In this paper, I will provide a brief overview of connected learning, the radical changes that teen services librarians will need to embrace to be the "connector" in connected learning, and the theoretical underpinnings of participatory design methods that can be used by librarians with youth to ascertain equal partnership with teens. I will then discuss selected participatory design techniques that have been used to design learning technologies in the field of human-computer interaction, which in turn can be adopted to design library programs, spaces, and services to enhance connected learning programming and services in libraries.

Literature Review

Connected Learning in a Nutshell

The ways teens learn, what they want to learn, and what they have to learn to be productive members of society have changed significantly in the recent decade. With the need to master emerging literacies, learn and communicate via networked technologies, and the preference to learn via mentorship and peer support compared to direct instruction, teens' learning processes and preferences are constantly changing.[xii] Ito and colleagues brought together these current

trends in learning to develop a framework called connected learning, which they characterize as a framework "under constant development that offers principles and examples to be adapted and remixed rather than a template for programs and activities [for learning]," precisely situating the learning process that is experienced by teens in the digital and information age.[xiii] In other words, connected learning is not afforded by a specific type of technology genre or platform, but embraces learning using networked technologies. In their seminal article about connected learning, Ito and colleagues define connected learning as "learning that is socially embedded, interest-driven, and oriented toward educational, economic, or political opportunity."[xiv] Driven by the technological, social, economic, and cultural changes in the society, connected learning is driven by an "equity agenda" that focuses on increasing learning opportunities for non-dominant youth.[xv] Interest-driven, peer-supported, and academically oriented are three learning principles of the connected learning framework. Each of the principles is briefly discussed below:

- *Interest-driven:* "When a subject is personally interesting and relevant, learners achieve much higher-order learning outcomes."[xvi] Personal affinity and engagement are the primary drivers for interest-driven participation. Ito and colleagues emphasize that interests can be developed and nurtured, in addition to teens' inherent interests, such as personal hobbies, media, and so on.[xvii] These interests and passions can be nurtured to allow the growth of diverse identities.[xviii]
- *Peer-supported:* "In their everyday exchanges with peers and friends, young people are contributing, sharing, and giving feedback in inclusive social experiences that are fluid and highly engaging."[xix] Such smooth interactions are not only between peers but can be facilitated or mentored by an adult (e.g., parent, librarian, teacher, etc.).
- *Academically oriented:* "Learners flourish and realize their potential when they can connect their interest and social engagement to academic studies, civic engagement, and career opportunities."[xx] Ultimately, teens learn the most when they are able to leverage their interests and connections for academic relevance.

The core properties of connected learning experiences are that they be "production-centered," with a "shared purpose," and be "openly networked."[xxi] Connected learning is "production-centered" because learners can utilize a variety of digital media tools to produce knowledge and cultural content through the practices of remixing and curation. It has a "shared purpose" because learners unite through shared goals and interests, creating cross-cultural and cross-generational learning. "Openly networked" refers to "online platforms and digital tools . . . [that] . . . make learning abundant, accessible, and visible across all learner settings."[xxii] While connected learning is applicable to any age group, Ito and colleagues explicitly point out its relevance to teens because the teen years are a "critical time when individuals form interests and social identities that are key to the connected learning model."[xxiii]

Radical Change in the Approach to Programming

To be the "connector" in connected learning, teen services librarians will need to fundamentally change the way they work with teens and how they offer programming for teens at their libraries. In order to realize connected learning in libraries, teen services librarians must acknowledge that teens have their very own interests and desires that deserve valid attention. It is imperative that teen services librarians understand these interests by intentionally talking to teens about their

interests, listening to them, facilitating non-dominant teens to voice their opinions, and reflecting on their roles and positions as they engage in these conversations with teens.[xxiv] To transition to these new roles and practices successfully, a radical change in the way that librarians work with teens is warranted to ensure that teens are equal partners in designing programming and services.

To explain this transition, I build upon Radical Change theory, developed in the 1990s by Dr. Eliza Dresang. Originally intended to explain changes evident in the *Black and White* picture book (winner of the 1991 Caldecott Medal), Radical Change theory over the last decade has been expanded to explain digital age books and digital age youth information behavior.[xxv] The theory has been acknowledged as being robust in terms of interpreting and predicting youth-related phenomena. Radical Change theory is rooted in the digital age principles of interactivity, connectivity, and access. Interactivity refers to "dynamic, nonlinear, and nonsequential learning and information behavior" that can be controlled by youth.[xxvi] Connectivity is the change in perspectives encountered by youth as they interact with their community and construct meanings of their social worlds. Access refers to penetrating "information barriers, bringing entrée to a wide diversity of formerly large inaccessible opinion."[xxvii] I utilize these digital age principles to establish three types of changes that librarians will need to embrace when working with teens in designing library programming and services, resulting in a typology of radical change (modeled after Dresang and Koh's approach in 2009[xxviii]) as presented in table 1 below.

Table 1: Radical Change Typology: Digital Age Teen-Librarian Engagement

Radical Change Types	**Questions**	**Characteristics**
Type 1: Changing forms of engaging teens	How do teens voice their interests and passions?	Obtaining teens' voices through participatory design Adopting interdisciplinary approaches to capture teens' voices Being aware of methods and techniques to work with non-dominant teens
Type 2: Changing perspectives	How do teens view libraries and librarians?	Transitioning librarians' roles from experts to facilitators Expanding the ecology of learning in libraries beyond books to digital media and social networks Developing programs that appeal to every culture, every teen, year-round
Type 3: Changing boundaries	How do teens connect with everyone around them—their	Strengthening relationships that empower learning within

	peers, their family, their librarian, and their community?	and outside of their communities Expanding "library learning" to places beyond the library such as home, school, community, etc.

Type 1 refers to the need to change forms of engaging with teens to obtain their thoughts and feedback on teen programming and services in libraries. To capture the voice of teens—and especially non-dominant teens who may potentially benefit the most from library programming and services—we need to devise participatory design methods to create programs for and with them. Type 2 refers to the need to change teens' views of librarians and libraries. Librarians need to be ready and willing to transition from expert to facilitator, engaging in active and continuous learning for and with teens to "re-imagin[e] services and spaces."[xxix] Teen services librarians will need to design programs and services that appeal to every culture and every teen year-round, not only seasonally. Having poetry-related activities solely during National Poetry month or having programs that appeal or appreciate African American culture exclusively during Black History month is no longer acceptable. Additionally, libraries can no longer simply emphasize their book collection alone or have programming solely based on book-related activities. Books are just one of many media types that teens are interested in; their ecology of learning is expansive and includes technology, movies, music, and so on. Type 3 refers to changing the boundaries of youth engagement to extend beyond the library building and its resources. Librarians can no longer quantify the success of their libraries based on how many books or resources have been checked out or the number of teens entering the doors of their libraries. Librarians need to develop dynamic community partnerships that reach beyond the library, specifically "building partnerships and collaborations in their communities."[xxx] Youth learning is boundless and centered on relationships—relationships between teens and library staff and between teens and the broader community. These relationships result in connections that allow libraries to create an evolving collection of programs and services that meet the requirements of individual teens and teen groups at any moment of need.

Participatory Design Methods

While the characteristics of forms and perspectives of teen-librarian engagement in the digital age as seen through the lens of Radical Change theory (see table 1 above) may seem avant-garde in librarianship, such an approach to engaging users has been utilized for decades in the design of technologies for adults and young people. Participatory design had its beginnings in Scandinavian countries, specifically incorporating workers' voices into the shaping of work environments and technologies.[xxxi] From its humble beginnings in work environments for adults, techniques used in participatory design have taken various forms, names, and contexts, including expansion of use to include children in the design of technologies as co-designers and not just as users. Druin describes the distinctive ways that children can play a role in the design of technologies—in a range from low to high involvement.[xxxii] These roles rest in a continuum that describes the nature of the child's participation from *user* to *tester* to *informant* to *design partner*. Fails, Guha, and Druin indicate that "as [a child] moves along the continuum, the role encompass[es] those at the less involved level."[xxxiii] While the roles that children play in the

design of technologies can be any one of the above-mentioned roles, the most involved role is the role of children as design partners. Since 2000, the idea of children as design partners has been the most widespread as compared to the other roles that children can play in the design of technologies. In this design partner role, "children become equal team members and stakeholders with adults. . . . [A]dults and children work as teammates in technology design."[xxxiv] Researchers have found that involving children in the design of technologies for children results in ideas and technologies that go beyond the concepts that adult researchers think of themselves.[xxxv]

While participatory design methods and techniques are used in areas such as finance, broadcasting, and psychology, a close examination of these articles reveals a strong theoretical origin and practice in participatory design research in human-computer interaction. There are several participatory design methods for designing technologies with and for youth, including bluebells, bonded design, and cooperative inquiry. In the bluebells method based on British playground games, articulated by Kelly et al., children between the ages of 7 and 9 engage in the design of technology utilizing the "play" metaphor.[xxxvi] Adopting a more serial approach to design, adults work together to design the system *before* play, followed by children engaged *during* play, and concluded with adults engaging in the design process *after* play. The "play" here refers to the stages of the actual design process. During "play," children participate in four different activities named after playground games that are directly related to a part of the technology that is being designed (i.e., the context, the content, navigation, and the interface). Adults observe children during play, and then discuss their observations and analyze the artifacts after the play.[xxxvii] In the bonded design method, children between the ages of 11 and 12 work together with adults frequently over a short period of time (i.e., a couple of times per week for six weeks) on a single project. In addition to being engaged for only a certain stipulated time period, children are not equal design partners, and their roles lie somewhere between being the informant and partner of the design process.[xxxviii]

There are three reasons why the cooperative inquiry method is particularly relevant to teen librarianship: (1) It can be used and expanded to work with children and teens (ages 5–17), whereas the other participatory design methods are typically used in working with children (typically 7–12 years old); (2) cooperative inquiry emphasizes building and sustaining the design partnership between adults and the children/teens on a longer-term basis (not a one-off) that spans across multiple collaborative projects, which is ideal in a library environment, where teens and librarians regularly see each other and have a sustained relationship; and (3) children/teens are equal partners throughout the design process, actively involved in technology design from conception to completion and are not just product testers alongside adult designers.

The goal of cooperative inquiry is to use a wide variety of ideation and evaluation techniques so that children, teens, and adults can share ideas in ways that maximize idea elaboration yet minimize differences in age, ability, and communication styles. Some techniques may need to be modified to accommodate developmental differences among different age groups (e.g., teens may ask for more structured design prompts; preschoolers will need help collaborating).[xxxix] A cross-comparative analysis of these above-mentioned participatory design methods is further detailed in Fails, Guha, and Druin.[xl] Techniques associated with each of these above-mentioned methods have been utilized to answer various technology design questions in the human-computer interaction field.[xli]

To be able to realize the three learning principles and three core properties of connected learning in the library, librarians must attempt to achieve all three of the Radical Change theory characteristics listed in table 1. This can be done by leveraging the techniques associated with participatory design methods to design programming and services for and with teens.

Objectives

As mentioned earlier, the cooperative inquiry method is the most relevant participatory design method for teen services librarians. Thus, the objective of this paper is to explain selected cooperative inquiry techniques that can be utilized by teen services librarians and to suggest potential scenarios whereby teen services librarians can adopt these techniques to increase teen-librarian engagement as indicated in table 1.

Methods

A thorough examination of a decade's worth of research literature on cooperative inquiry techniques (2005–2015) yielded twenty-three peer-reviewed articles and conference papers from the human-computer interaction field that clearly indicated the use of one or more cooperative inquiry techniques. Five- or ten-year spans are relatively standard for analyzing methodological trends of specific domains.[xlii] These peer-reviewed articles and conference papers explain one or more of the following: the foundation for the cooperative inquiry method, a selected cooperative inquiry technique or techniques involving children/teens in the design of technology or learning programs, and an extended explanation of the choice of cooperative inquiry technique in the design of specific technologies and learning programs (beyond simply saying that they used a selected technique). All these articles focus on children and adolescents between the ages of 5 and 17 years old.

Findings and Discussion

In this section, I will share five cooperative inquiry techniques that have been predominantly used in the human-computer interaction field to design technologies and learning programs with children and teens. For each of these techniques, I will describe the technique, how it was used, and how teen librarians can use it when working with teens.

Bags of Stuff

The formal name for this brainstorming technique with youth is *low-tech prototyping*, but it is fondly referred to as *bags of stuff*.[xliii] With the primary goal of creating multiple solutions to an early stage design problem, groups are formed with a balanced mix of adults and children/teens (2–3 young people with 2–3 adults).[xliv] A problem is presented to the large group, and then each group receives a "bag of stuff," which has arts and crafts materials, such as construction paper, crayons, glue, tape, scissors, yarn, cotton balls, and so on, as well as "found objects" like leftover Styrofoam packing, wine corks, old LEGO pieces, small boxes, etc. Depending on the nature of the problem, appropriate three-dimensional materials (e.g., matchboxes to represent computers, or bells and noisemakers to represent auditory objects for an audio project) are also provided.[xlv]

Using the materials provided in the bag, each group brainstorms a solution to the problem and designs "low-tech" prototypes of their solution. Due to the nature of low-tech prototyping and

because adults are working collaboratively with youth, adults must also pay attention to the verbal conversations that happen in the group and take written notes to ensure that the discussions and elaboration of the solutions are not lost in the representation of the artifact or solution produced.[xlvi] Typically, one adult is also designated to be a *floater* who moves from one group to another to obtain a sense of direction of the conversations and solutions in all groups. After the low-tech prototypes are created, each group presents their ideas to one another. The floater adult will take notes on a whiteboard, writing down the major ideas that emerged during these presentations. As each team presents, any ideas that are surprising, most repeated among groups, or that receive the most reaction from the whole team are documented on the board. After the presentations, the adult team members discuss these ideas and decide which one(s) to pursue.[xlvii] This brainstorming technique has been successfully used in the design of many innovative technologies, such as Tangible Flags and Mobile Stories.[xlviii]

Teen librarians can adopt the bags of stuff technique in the design or redesign of teen spaces at their libraries. Whether they are designing makerspaces, learning labs, learning commons, or teen workspaces, librarians can engage teens in representing their ideas visually by using this technique. Librarians can prepare appropriate "stuff" for the bags based on the problem that is at hand and collaborate with teens to come up with excellent practical designs for their physical spaces. Additionally, because this technique has been used in the design of technologies for children, librarians can also use this method to design virtual spaces for teens that are associated with the library, such as library web pages that are dedicated to teens or other peripheral technological services or virtual spaces provided by the libraries exclusively for teens.[xlix]

Figure 1: A Library Teen Space Designed Using the Bag of Stuff Technique

Mission to Mars

In Mission to Mars[l] (inspired by the brainstorming technique of fictional inquiry), teens interact with "Martians" who are adults. The "Martian" adult will be in a different room than the teens, but will be able to communicate via video-conferencing technology such as Skype, Google Hangout, and so on. The "Martian" adult will initially broadcast a message in the form of asking for a potential solution or providing a prompt to the teens. Then the Martian can opt to go offline or stay online, and the teen design partners work in small groups on solutions to the prompt or problem that the Martian has presented.[li] The brainstorming time given to the teens ultimately depends on the nature of the problem presented and the time that the teens and adults can allocate to this technique. The session culminates with each group of teens presenting their ideas to the Martian. The "fictional" part of the inquiry is the use of the "Martian" concept, which allows teens to be more open, honest, and descriptive because they are creating an idea for a "Martian" rather than a human adult or librarian. The adult designers take notes or view the recordings of the video to amass the big ideas that were presented by the teens.[lii] [liii]

Teen librarians can utilize this technique in the design of programming and services that they intend to offer to teens. The key is in the articulation of the problem or prompt by the "Martian." This technique is perfect for exploration of novel ideas or adoption of new technologies or trends in the library, whereby the teens will need to explain in detail to the Martian how they would like a technology or innovation to be deployed at the library. For example, the Martian can provide the teens with the following prompts: "For the first time ever, Mars is about to explore gaming in our libraries. How do we design our library space so that teens come to play games with each other at the libraries? What gaming application, accessories, and support should we provide? How can we launch this new gaming initiative in a way that the Martian teens will actually come and play games at the library?" The gaming example provided here can be replaced with any other new genre of learning or innovation.

Layered Elaboration

Fails, Guha, and Druin indicate that youth are oftentimes uncomfortable messing with or ruining the work of other youth and adult design partners. "Even if the work in question is a low-tech, initial, brainstormed prototype, designers, especially youth design partners, can be sensitive to changing the work of others."[liv] Hence, the *layered elaboration* technique works well because it allows designers to elaborate on ideas by changing, extending, adding, and/or eliminating the ideas of others without killing the original ideas or ideas that are thought of throughout the process. To begin, teens in a whole group are provided with either a base design, or they can design from scratch.[lv] In small groups, teens sketch their designs using permanent markers on plain white paper attached to clipboards. In a dedicated interval of times (typically every 15 to 20 minutes), all groups come together for a meeting where each group briefly presents their ideas. These large group meetings allow elaboration on the designs so that the next iteration can occur. After the first large group meeting, the first iteration of the idea is then transferred to a clear transparency film and passed to one of the small groups. This group places a clear overhead transparency on top of the initial idea and adds their ideas to the initial storyboard. This process is repeated until each group has had an opportunity to include their design ideas. In this way, all changes are layered, and any elimination is indicated by crossing out ideas. A final debrief meeting is held after all groups have had a chance to provide their design ideas. During the debriefing, an adult design partner will capture the big ideas on a whiteboard or a large sheet of

paper. The layered elaboration technique has been successfully utilized in the design of screen-based media.

Teen librarians can utilize this technique for the design or redesign of physical or virtual spaces at the library and/or web pages. Due to the nature of teens' visits to libraries that are on a drop-in and unstructured manner, teen services librarians can adapt this technique to work with groups of teens who visit the library at different times to build on each other's ideas. In this way, teen services librarians can also take note of the different ideas that originated from teens with varying interests and consider their preferences in the design of physical and virtual spaces. Additionally, this method can be used when teens are collaboratively designing a station in a makerspace, designing and building an artifact for the community, designing the display of collections at the library, and so on.

Figure 2: Layered Elaboration Technique

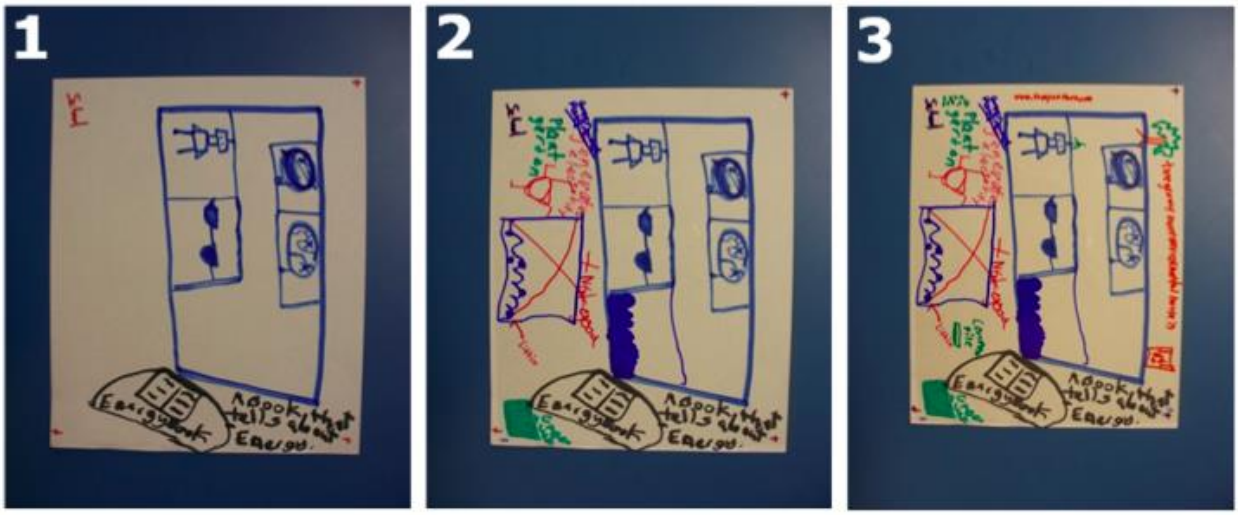

Photo credit: Kidsteam, Human-Computer Interaction Lab, University of Maryland

Big Paper

The *big paper* approach is a two-dimensional brainstorming technique that allows teams of adults and teens to "collaboratively work on one idea" using a large piece of paper that is placed on the floor or on a table.[lvi] Instead of using small sheets of paper, brainstorming uses large sheets of paper, which allows design participants to gather around one workspace, and hence provides adult and teen design partners an equal voice in the generation of ideas. To facilitate discussions, adult designers can divide the large sheet of paper into three sections: What, Why, How; these will allow teen co-designers to sketch out their questions, challenges, and design ideas.[lvii]

Figure 3: Big Paper Technique

Photo credit: Kidsteam, Human-Computer Interaction Lab, University of Maryland

Teen librarians can utilize this technique for the design of an entire arc of programming that they would like to offer for an extended period of time. Librarians can provide teens with general or specific genres such as gaming, fan fiction, science-infused movies, superheroes, sports, music, fashion design, and so on, which will allow teens to come up with their own programming and activities centered around these genres.

Sticky Noting

Used primarily for evaluation of certain products or services, *sticky noting* is a rather simple cooperative inquiry technique. In designing technologies, teens use sticky noting to evaluate an existing technology or critique a prototype that is under development (either working or low-tech prototypes).[lviii] For this technique, pens/pencils and sticky notes (also known as Post-it notes) are needed. All adults and teen design partners use or view a technology and begin writing their likes, dislikes, surprises, and design ideas on the sticky notes. The rule of thumb to remember in the execution of this technique is that each like, dislike, surprise, or design idea must be written on a separate note. As the notes accumulate, adult design partners will typically gather them all and stick them on a large wall space or whiteboard. One adult design partner (or sometimes two) will group the sticky notes into categories (likes, dislikes, surprises, design ideas) and subcategories (thematic elements that emerge within the larger categories, such as navigation, look and feel, color, etc.). Typically, the whole group will come together at the end of this exercise to discuss and review the themes that emerged. This results in an informal frequency analysis that points to the fertile direction of the next iteration of the technology. This evaluation technique has been successfully used in the design of many innovative technologies, such as the International Children's Digital Library, the I'm Going Bananas game, and ScienceKit.[lix]

Teen librarians can utilize this technique to evaluate the design of existing physical or virtual spaces at their library, programming, and/or services. Additionally, they can sketch prototypes of new physical or virtual spaces at their library or the library programming and obtain feedback from teens at any stage in the development.

Figure 4: Sticky Notes Clustered into Themes on a Whiteboard

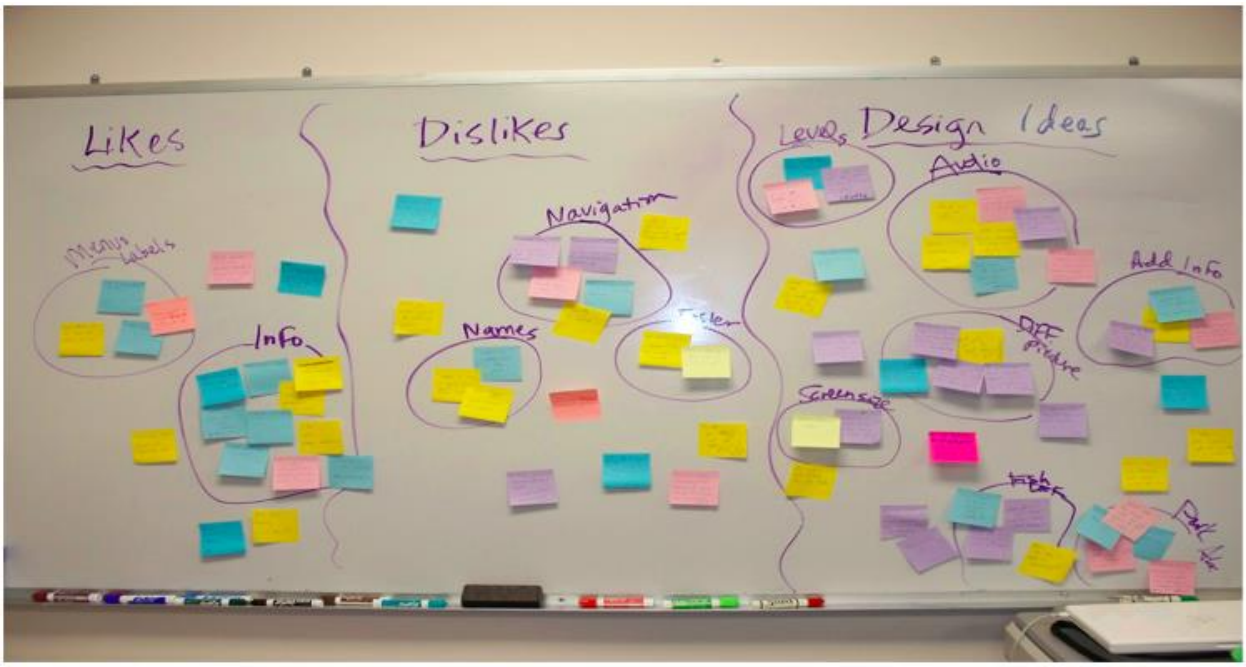

Photo credit: Kidsteam, Human-Computer Interaction Lab, University of Maryland

Conclusion

This article is one of the first to promote the use of participatory design techniques informed by research in other fields that can be adopted by teen librarians, particularly in capturing youth voices. While it is not meant to be an exhaustive list of cooperative inquiry techniques, the techniques shared here shift the power dynamics in the library, from librarians being experts to taking on the role of facilitators and design partners. In order for libraries to be connected centers of learning and librarians to be the connectors in connected learning, feedback from teens—whose needs and interests continue to evolve—is crucial to ensure that proper teen programming and services are in place for them. Almost all the questions posed in *The Future of Library Services for and with Teens*[lx] to guide local assessment and planning can be answered by engaging teens using the cooperative inquiry techniques presented in this paper. Such equal partnership with teens in the design of teen-related services and programs will situate both teen services librarians and teens as equally responsible for the learning that happens in the library.

Acknowledgments

I would like to thank YALSA for sponsoring the presentation of this paper at the 2015 ALA Midwinter Trends Impacting Young Adult Services session. My heartiest gratitude goes to the Human-Computer Interaction Lab at the University of Maryland, particularly to Dr. Alison Druin, who had inspired me to utilize these cooperative inquiry techniques in my own research. With her encouragement and mentorship, I am now able to share these techniques with teen librarians nationwide who can empower teens to contribute to the design of programs and services at their library. I would also like to thank Christie Kodama for her assistance with this paper.

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How Usable Are School Library Websites? A Random Sample from All Fifty States

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Abstract

This study examines the basic design layout, content, and usability of 300 randomly sampled elementary (n = 100), middle school (n = 100), and high school (n = 100) library websites representing all fifty states in the United States. Of the schools selected, 102 of the school librarians also completed a survey examining their libraries' information and service priorities, site maintenance, and primary users. The results show that the majority of school library websites contain information intended for students but rate low on recommended youth-oriented website standards for cognitive, affective (or emotional), and general design best practices regardless of the age group served. Trends in design layouts and content were also identified. Major implications of the study include a best-practices checklist and preliminary design and content guidelines to help school librarians create more age-appropriate websites for their students.

Introduction

This study explores how best practices identified through the growing body of research in cognitive information-seeking behaviors and website design are applicable to the general usability of school library websites. Research suggests significant differences between how

adults and youth seek information and their preferences in seeking information in online digital environments.[i] Given the growing body of knowledge about these differences, our study sought to explore several questions: What does a typical school library website look like in terms of design and content? How does it compare to research-based best practices? And is it age-appropriate-designed more for youth or adults?

Literature Review

To better understand the efficacy of school library website design, it is essential to understand the context in which teachers, librarians, and students seek and use information. Based on a growing body of research, information-seeking differences between adults and youths appear to be largely due to affective and cognitive factors and widely variant goals. Adults are generally more confident, able to process and sift through large amounts of less concrete information, and, in general, are goal-oriented.[ii] Youth, on the other hand, are less confident, need more assurance and support, are less able to process large amounts of abstract information, and are more exploratory than goal-oriented when seeking information.[iii]

Youth Information-Seeking Behaviors

In terms of information seeking, youth can be broken down into four discrete information-seeking groups defined by their ability to read and Piaget's cognitive developmental stages. Coinciding with these stages, Cai and Zhao contend that youths store and retrieve information based on their cognitive ability and have two primary information-processing deficiencies.[iv]

> 1) *Pre-readers* (3–5 years old) are in Piaget's sensory motor stage.
>
> 2) *Beginning readers* (5–8 years old) are in Piaget's pre-operational stage and in preschool or early elementary school; this phase is characterized by "ego-centrism," where children are self-centered and expect the world to operate according to their worldview and perspective.[v] Children who are pre-readers or beginning readers around seven years old or younger tend to suffer from meditational deficiencies and are considered limited processors, which reflect this age group's inability to use effective information storage and retrieval strategies.
>
> 3) *Intermediate readers* (9–12 years old) are in Piaget's concrete operational stage; these preteens understand the world through concrete objects and trial-and-error learning.[vi] Youth who are intermediate readers around 9–12 years old tend to suffer from production deficiencies and are considered cued processors who are able to begin using more effective storage and retrieval strategies, but only when they have cues guiding them.
>
> 4) *Advanced readers* (13–17 years old) are teens and in Piaget's formal operational stage, where symbols associated with abstract concepts are meaningful as they begin to emerge into adult information seekers.[vii]

Youth older than twelve or thirteen tend to be advanced readers and outgrow these cognitive deficiencies; they are referred to as *strategic processors*, which reflects adult information-seeking tendencies.[viii] Pre-adolescent web information seekers (10–13) prefer visual cues over dense text, and their information-seeking behavior focuses more on exploration rather than strategic searching for clearly defined information goals. Sites that keep this age group's

attention use bright colors and are visually appealing with the common use of animation, sound, and visual graphics and icons. This age group does not like to scroll, prefers to browse over using search engines, and becomes quickly frustrated with lack of success.[ix]

Adolescent web information seekers (14–18) still prefer to browse rather than conduct specific keyword searches.[x] This group also likes sites that have "cool" graphics, are interactive so they can socialize with others, and enable them to leave their mark on the site through online quizzes, voting, blogging, and games.[xi] This age group has begun to more closely reflect adult information-seeking behavior, and teens like to scan pages quickly looking for visual cues that allow them to quickly determine whether the site is a usable site for them - that is, relevant with high-quality information.[xii] Like adults, most teens find moving images, sounds, and other scrolling information "distracting" and tend to ignore them with some disdain.[xiii]

Designing Websites for Today's Students

Prensky coined the term *digital natives* to describe youths who were born with digital access to computing and the Internet, while older generations represent *digital immigrants*.[xiv] Too often teachers make the mistake of assuming that being a digital native is synonymous with information-seeking expertise because "their extensive use of ICT (Information and Communication Technology) often creates a false sense of competency, as well as the misperception among many adults that contemporary youth are "media savvy."[xv] Often adult web designers create sites intended for youth but with adult users in mind.[xvi] Design goals for youths such as "cool," "engaging," and "age-appropriate" that are defined using an adult-centered paradigm are usually off target. Chow, Smith, and Sun refer to the process of more accurately operationalizing youth ideas and meaning into youth-oriented websites as *concept actualization*.[xvii] A growing body of research suggests that working with youth throughout the life cycle of a website - analysis, design, development, implementation, and evaluation—is the appropriate way to ensure that youth perspectives and priorities are appropriately included.[xviii]

A thorough review of the literature suggests three domains to consider when designing websites for youth: cognitive, affective, and design. The *cognitive domain* reflects age appropriateness, with a match between the age of youth for which the site is intended and site design involving seven primary factors (see table 1).

Table 1. Age-Appropriate Cognitive Factors

1. Amount of text on a page (Bilal 2005)
2. Vocabulary (Cooper 2005; Dubroy 2010)
3. Graphics (Large, Beheshti, and Rahman 2002)
4. Cues (Rose, Rose, and Blodgett 2009)
5. Pictorial searching (Rose, Rose, and Blodgett 2009)
6. Icons to represent ideas (Cooper 2005; Dubroy 2010)
7. Games (Nielsen 2000)

The *affective domain* involves ensuring an emotionally safe environment that minimizes uncertainty and fear of failure by providing feedback and using clear organization.[xix]

Establishing a positive affective environment for youths on the web involves seven factors (see table 2).

Table 2. Age-Appropriate Affective and Emotional Factors

1. Images that youths can relate to and are comforted by (Cooper 2005)
2. Sounds that provide feedback and reflect interaction (Cooper 2005)
3. Interactivity with others (Teo, Oh, and Lui 2003; Bilal 2005; Dubroy 2010)
4. Personalization (Large, Beheshti, and Rahman 2002; Dubroy 2010)
5. Play (Dubroy, 2010; Large et al. 2009; Cooper 2005)
6. Open exploration (Bilal 2005)
7. Self-paced (Cooper 2005)

The *design domain* involves actually incorporating identified best practices that help make a website an inviting, age-appropriate digital environment designed to maximize interest and present information that youth can effectively search and engage with. There are four primary design factors to account for (see table 3).

Table 3. Age-Appropriate Design Factors

1. A child-centered, youth-oriented approach (Druin 1999; Bilal 2002; Large, Beheshti, and Rahman 2002; Large, Beheshti, Nesset, and Bowler 2004)
2. Allow youths to control the pace and create their own, unique paths (Cooper 2005)
3. Ability to leave a footprint (Bauman 2009; Large et al. 2002; Dubroy 2010)
4. Simple, youth-oriented layouts (Cooper 2005; Nielson 2002):
    - Bright colors (Bilal and Kirby 2002; Bilal 2005; Dubroy 2010; Large, Beheshti, and Rahman 2002; Large, Beheshti, Nesset, and Bowler 2004)
    - Site mascots (Bowler 2004), creative icons (Bowler 2004; Large et al. 2004)
    - Fun name (Large, Nessit, Beheshti, and Bowler 2004)
    - Animation and graphics (Bowler 2004; Large et al. 2002; Dubroy 2010; Large et al. 2004; Nielsen 2002)
    - Characterization (Bowler 2004)
    - Logo in upper left corner (Nielsen 2004; Nielsen 2010)
    - Homepage search box with keyword searching (Nielsen 2004)
    - Horizontal breadcrumbs (if used) (Nielsen 2004; Nielsen 2010)

Chow, Smith, and Sun utilized these three domains as a best-practices checklist to create age-appropriate websites for middle school and high school students as part of the NSF-funded STARS Alliance, which focused on broadening participation in computing and information technology.[xx] Working with youth design partners, the middle school site (figure 1) was defined by bright colors in the background and foreground, smiling faces, sound effects, animation, and access to online games and fun quizzes. The high school design (figure 2) was a bit less colorful, based on high school student feedback, and focused more on social communication (blogs and polls), careers, and answering specific questions on subjects such as types of jobs, salaries, and sharing real stories.

Figure 1. Middle School Website

Figure 2. High School Website

Usability

The International Organization for Standardization (ISO) formally defines *usability* (standard ISO 9241-11) as the "extent to which the product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use." *Effectiveness* is the "percentage of goals achieved, percentage of users successfully completing tasks, and average accuracy of completed tasks"; *efficiency* is the "time to complete a task, tasks completed per unit time, and monetary cost of performing the task"; and *satisfaction* is a "rating scale for satisfaction, frequency of discretionary use, and frequency of complaints."

In practice, the concept of usability is experienced on the web in two measures. The first measure is the utility of a website and its ability to meet the information needs of its users. The second measure is ease of use, which is experienced as relatively "pain-free" information seeking free from lots of mental effort, confusion, and having to search too hard to find what a user is looking for. Application of this concept is difficult, however, because different users have both different information needs and preferences in how they search for information on the web. In essence, the path toward web usability is paved with a design that reflects the integration of the high-priority needs of its different user groups (referred to as features checklist) and organizational priorities along with a design that is focused on its specific user groups and their unique preferences in the cognitive, affective, and design domains.

School Library Websites

Tips and strategies for building school library websites are offered in practitioner-based publications.[xxi] There is a smaller body of research literature about school library website content, use, and exemplars. Valenza developed two taxonomies for describing features and characteristics of school library websites, based on a Delphi-method investigation of exemplary school library websites.[xxii] This study emphasizes the use of the library website by students and teachers in fulfilling curricular objectives for content areas as integrated with digital literacies. To this end, among the recommendations of the study was the suggestion that additional training may support school librarians in making websites more "accessible and engaging" for students.[xxiii] Also addressing the instructional potential of school library websites, Jackson studied the information literacy needs of a group of high school students. Based on the results, Jackson designed school library web pages with instructional scaffolds for cognitive, metacognitive, procedural, and strategic processes.[xxiv] Jurkowski conducted a content analysis of school library websites in Missouri and identified categories of basic, school library specific, content area, and "interesting features" of the websites.[xxv]

School library websites may be studied in comparison to other library websites and websites designed for children, but it is also helpful to consider school library websites as part of general K–12 school website development and use. Hartshorne et al. developed a checklist for evaluating elementary school websites, with categories of Design, Structure, and Content.[xxvi] In applying this checklist to fifty existing school websites, researchers found that the majority of school websites followed basic web design elements effectively. The websites earned good checklist scores in efficiency and ease of navigation, but scores dropped for not having group-specific pages. Also of note was that overall, the sites showed limited use in showing student work (which the authors assert is an important potential use of school websites, per related research findings) and no indication of adherence to accessibility guidelines.[xxvii]

A recent study by Naughton analyzed sixty teen library websites (TLW) and identified four types of website designs or models: Reading, Media-Oriented, Portal, and Information Discovery. The majority of websites evaluated reflected the Reading model: sites that heavily emphasize text and present "predominately a text-based content representation design, where information is presented as paragraphs or blocks of text throughout the user experience." Naughton also noted that the predominance of the Reading design "can be a potential issue for the future of TLWs" because teens may find them "boring and plain," and recommended that for a teen-oriented site to be successful, it must be "easily accessed and used."[xxviii]

As the knowledge base of how to effectively develop youth websites continues to mature and evolve, our study sought to explore how well school library websites were incorporating these findings. We have found a scarcity of other studies in the literature examining youth website design applied to school library websites. Initially this study began as a funded summer project at a university in the southeastern United States, and then it evolved into a nationwide study that sought to answer four central research questions: (1) What does a typical school library website look like? (2) Who are school library websites designed for? (3) How do school library websites compare to recommended best practices? (4) How usable are school library websites?

Method

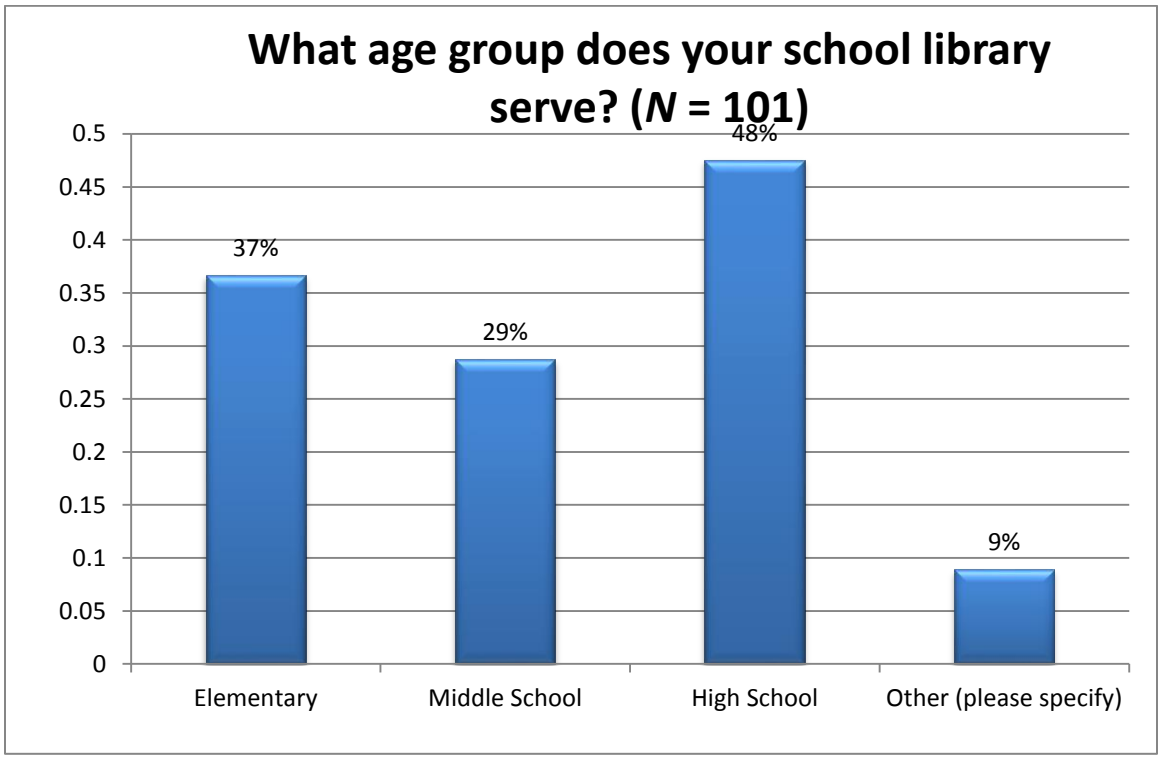
Sampling and Participants

To protect against sampling bias and to increase the likelihood that we were evaluating a "typical" school library website, we used random sampling to select school library websites across the country. In addition, the school librarian of each website evaluated was sent a survey so we could better understand the purpose and context of each site in terms of grade level, priorities, and support and maintenance.

Sampling. In order to ensure a representative sample of school libraries to evaluate, a random selection of one rural (a population of less than 50,000) and one urban county (a population greater than 50,000) from every state was first selected from the US Census Bureau website. From each of these selected counties, one elementary, middle, and high school was randomly selected for evaluation by identifying them through each district's website.

Participants. A total of six school library websites were selected and evaluated in each of the fifty states (three from a rural county and three from a urban county) in the United States (n = 300; 100 elementary, 100 middle school, and 100 high school) using an instrument created for the study, the School Website Checklist (see figure 3).

Figure 3. Librarian Sample



Instrumentation

The study utilized two instruments for the study: the School Website Checklist and the School Librarian Website Survey (as examined further under "School Librarian Perspectives," below).

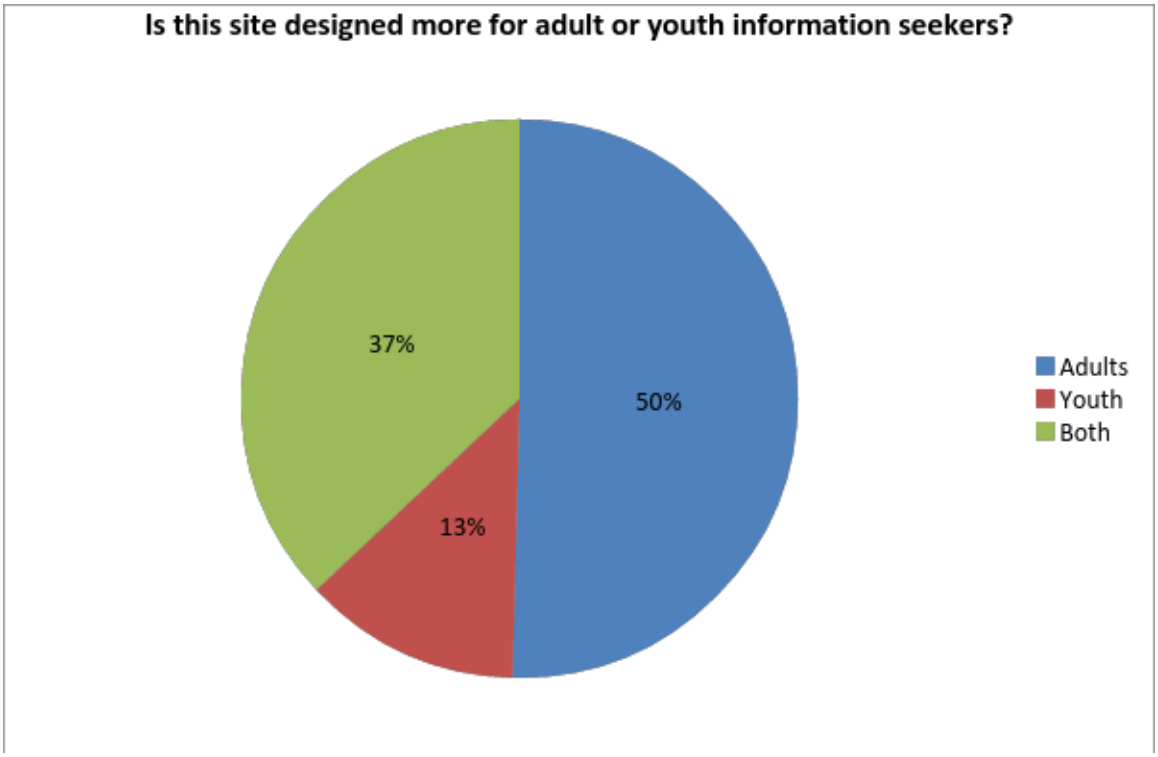
School Website Checklist. This is a 38-item online checklist developed for the study as derived from the literature. The checklist was organized into seven areas: site information, cognitive elements, affective elements, design factors, feature placement, content, and site ratings (see Appendix A: School Website Checklist).

School Librarian Website Survey. This survey was made up of nine items examining the library's website design and management, as well as the top five information and service priorities of the library. Each school that was randomly selected was e-mailed an online survey to complete (see Appendix B: School Librarian Website Survey).

Results

The majority, or 82% (n = 240), of the 300 schools evaluated had a school library website. Overall, when compared to recommended best practices from the literature (e.g., use of color, graphics, animation, symbols, etc.), the evaluated sites appeared to be designed more for adults (50%, n = 112) than for youth (13%, n = 30), while many also appeared to be geared to both adults and youths (37%, n = 83) (see figure 4).

Figure 4 - Who Was the School Library Website Designed For?



Cognitive Design

In terms of best practices for cognitive design as identified by the literature, ratings for youths were extremely low. For example, sites rated low on a 10-point quantitative scale (1 = low, 10 = high) for use of symbols that represent concrete objects (*M* = 3.3), bright and engaging colors that attract attention and keep youth interested (*M* = 3.3), well-thought-out portal names (*M* = 2.9), creative and significant icons (*M* = 2.6), and animation (*M* = 0.82).

The two factors that rated highest were age-appropriate graphics and vocabulary (*M* = 5.0) and access to electronic resources including databases, online reference, and e-books (*M* = 4.4).

Affective Design

The overall ratings for affective design were similarly low. Sites rated low for the opportunity to play and learn (*M* = 3.1), encouraging exploration (by being open-ended) (*M* = 2.3), active designs (*M* = 1.8), user control (*M* = 1.7), allowing for and responding to child input (*M* = 1.5), the ability to leave their footprint on the site (*M* = 0.60), and opportunities for social interaction (*M* = 0.60).

The highest-rated factor was reducing cognitive load by limiting distracting information and presenting only the information desired in a prominent, singular fashion (*M* = 4.6). Table 4 lists the mean ratings for all factors evaluated.

Table 4. Cognitive, Affective, and Design Ratings for School Library Websites

Web Factor	Mean Rating
Are graphics and vocabulary age appropriate?	5.01
Does the site reduce cognitive load by limiting distracting information and presenting only the information desired in a prominent, singular fashion?	4.61
Is there a link to access electronic resources including databases, online reference, and e-books?	4.46
Does the website use symbols related to concrete objects?	3.34
Does the site use bright and engaging colors that attract attention and keep youths interested?	3.24
Can users enjoy themselves through play and learning?	3.07
Does the site have a well thought-out portal name?	2.92
Are there search tips or instructions for searching?	2.72
Does the site use creative and significant icons?	2.61

Does the website's design encourage exploration (by being open-ended)?	2.28
Does the website balance familiarity with novelty?	1.76
Is the website design active?	1.75
Does the website design emphasize user control?	1.7
Does the site offer quick feedback?	1.64
Does the website allow for and respond to child input?	1.5
Does the site have a URL that's easy to remember?	1.24
Does the site use animation?	0.82
Does the site allow for trial and error with physical, not abstract, objects?	0.67
Can users leave their footprint on the site?	0.62
Does the site support social interaction?	0.56
Does the site allow for progressive levels of expertise facilitating competence while offering new challenges?	0.52
Does the website involve multiple senses?	0.44
Does the site use sound effects?	0.19

Comparing Elementary, Middle, and High School Websites

Unexpectedly, we found that there were very few differences between school library website design and age group served. For example, for use of symbols and illustrations, it would be expected to see a higher use of these at the elementary school level, but very few school websites did this in general and there were no significant differences based on age group. Two significant differences, however, were identified. For age-appropriate graphics and vocabulary, high schools (M = 5.6 out of 10) and middle schools (M = 5.0) were found to be more age-appropriate (because most sites in general appeared to be developed by and for adults) than for elementary schools (M = 4.0). Links to electronic resources were also significantly higher for high school sites (M = 5.0) compared to middle school (M = 4.3) and elementary school (M = 3.9) sites.

Overall, 51% of all websites were deemed designed for adults, 36.5% for both adults and youth, and only 12.5% appeared to be designed for youth based on identified best practices.

Design: What Does a School Library Website Look Like?

In comparison to identified best practices for basic website design in terms of cognitive, affective, and design domains, only 1% (n = 2) were considered top tier and had age-appropriate web features from each of the three domains (upper 33%); 17% were considered mid-tier and had web features from at least two of the domains (mid 33%); and 81% were considered lower

tier and had web features that were in only one domain or none at all (lower 33%). The most common features available were access to databases (76%, *n* = 120), access to information literacy resources (77%, *n* = 123), library hours (47%, *n* = 74), access to an OPAC (online public access catalog) (62%, *n* = 98), book recommendations and reviews (46%, *n* = 73), library news and events (45%, *n* = 71), library policies (40%, *n* = 64), and access to a personal account (39%, *n* = 62).

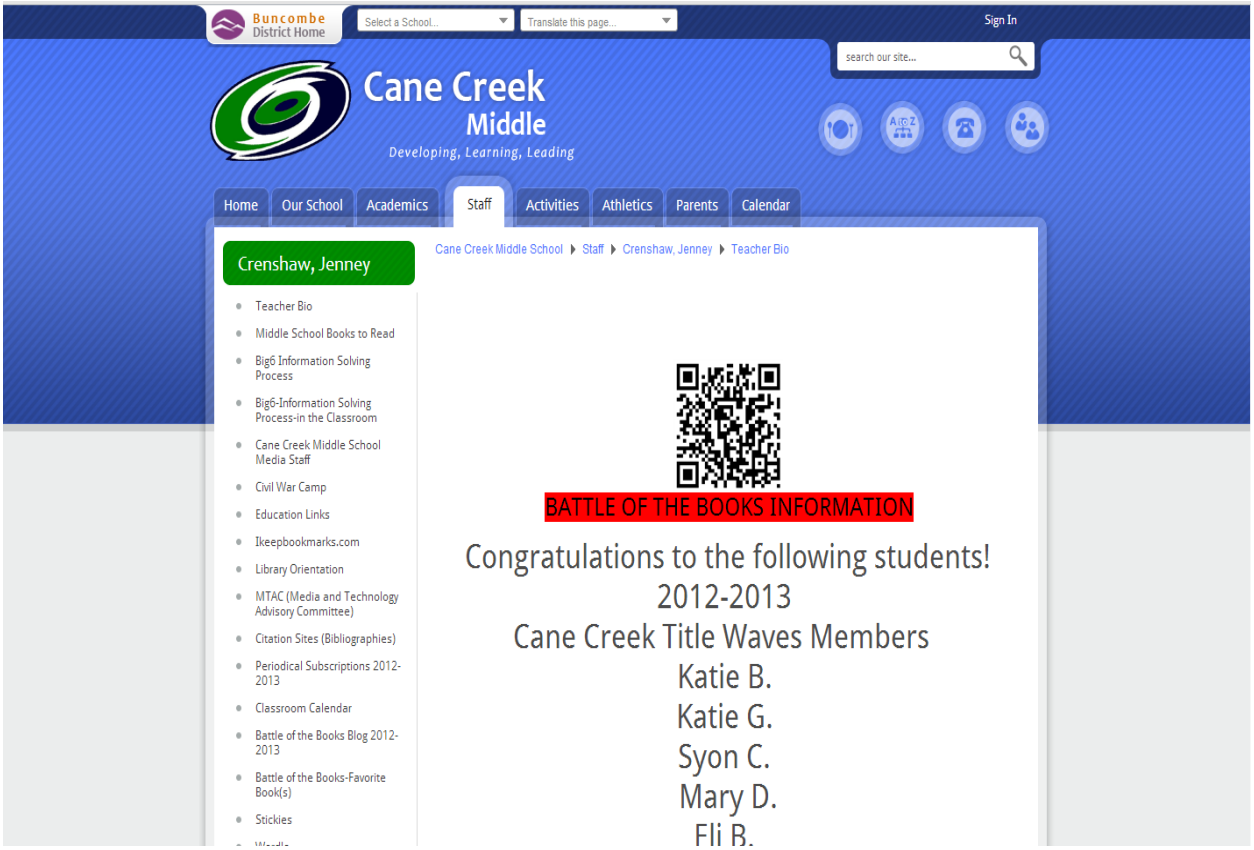
The majority of school library websites have their main navigation located on the left side (66.2%) or top center (52%). In terms of name and logo, 77% have them either located at the top center (43%) or center (34%) of the page header. Some libraries also had their name and logo on the top left (16%) of the page. The majority of the sites, however, did not have their library contact information on the homepage (60%), while those that did located it on the center (21%) of the page. In terms of library location information and business hours, again the majority of sites (64%) evaluated did not have this information available; those that did had this information placed at the bottom center (13%) or bottom left (9%) of the page. Table 5 shows the content found on school library websites.

Table 5. School Library Website Content and Services

Answer Options	Response Percent	Response Count
Access information literacy resources	79.60%	187
Access databases	73.60%	173
Access an OPAC	63.00%	148
Find library hours	48.10%	113
Find book recommendations/reviews	43.40%	102
View library news and events	42.60%	100
View library policies (checkout, overdue policies, etc.)	41.30%	97
Access personal account	38.70%	91
View the library	35.70%	84
Receive help with research from a librarian	6.00%	14
Sign-up for a class with the librarian	4.30%	10
Renew library materials	4.30%	10
Reserve a library resource online	3.40%	8
Schedule a classroom	3.00%	7
Reserve technology	1.70%	4
Search for available hardware and software	0.40%	1
None	0.40%	1
Other (please specify)	8	

Figure 5 shows an example of one of the higher-rated school library websites evaluated. The site contains the primary design layout, color scheme, and innovative use of technology that engages students.

Figure 5. Cane Creek Middle School
(http://www.buncombe.k12.nc.us//Domain/387)



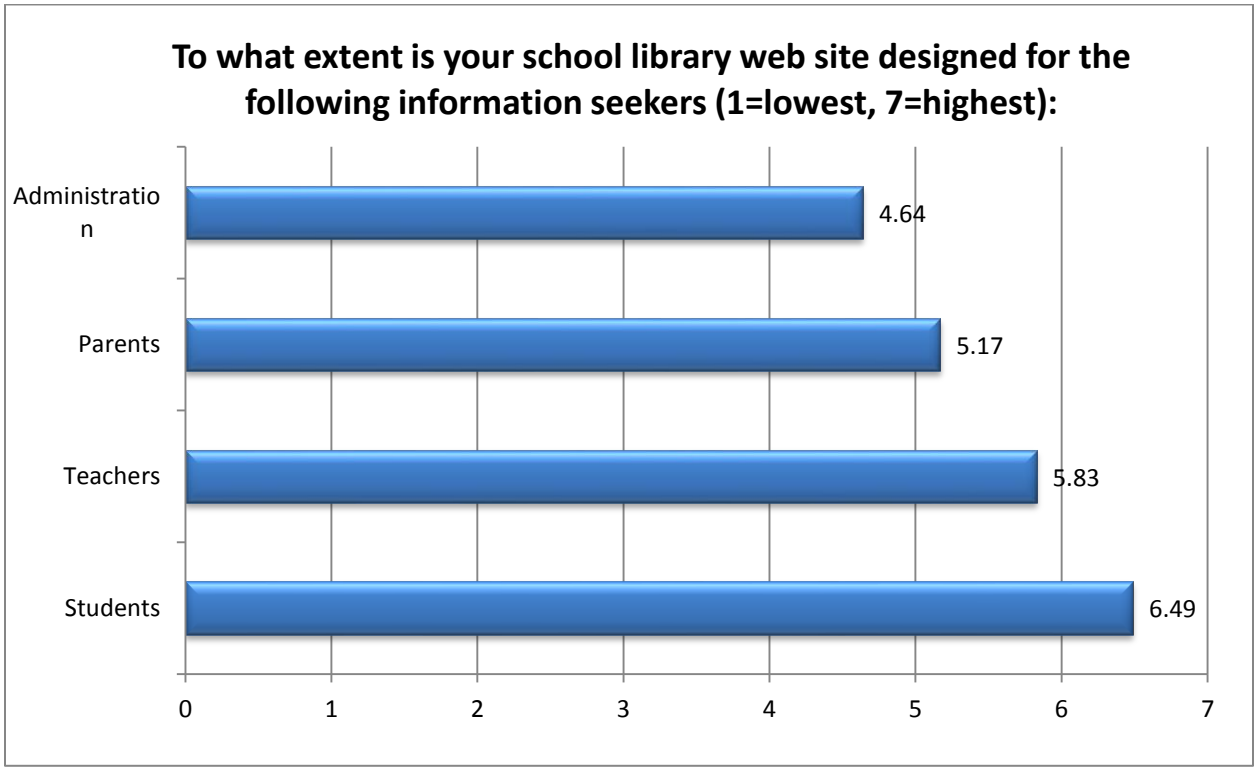
School Librarian Perspectives

In addition to the 300 school libraries evaluated, each of the school libraries selected were sent an online survey, and 101 school librarians (37% elementary, 29% middle, 48% high school, and 9% other— K–12, pre-K, two separate schools, etc.) responded, which represents a 34% response rate.

Websites Designed for Students

For the librarian survey, 83% (n = 84) of the respondents said they had a website, 7% said they did not have a website, and 12% said they had a web page or multiple websites for multiple schools. Overall, librarians felt their websites, on a scale of 1–7 (1 = low, 7 = high), were designed mostly for students (M = 6.4), teachers (M = 5.8), parents (M = 5.2), and administration (M = 4.8) (see figure 6).

Figure 6. Who are School Library Websites Designed for?



School Library Services

In terms of services, school libraries provided books, journals, and other print materials (100%), online databases (93%), computers or other technologies (93%), instruction and training (90%), areas for studying (88%), meeting spaces (85%), and technology support (75%) (see table 6).

Table 6. School Library Services

Services & Resources Provided by School Libraries	**Response Percent**	**Response Count**
Books, journals, other printed materials	100%	80
Online databases	93%	74
Instruction/training	90%	72
Computers/technology	90%	72
Studying	88%	70
Meeting space	85%	68
Technology support	75%	60
CDs or other media	74%	59
Testing	61%	49

Socializing	60%	48
Access to social media	18%	14
Access to gaming	14%	11

High-priority services. Overall the main services used by patrons and library staff were similar. Librarians felt that both their number one goal and students' and teachers' highest-priority goal were books and other print materials (*M* = 1.47 ranking for patron usage). Whereas computers or other technology was the next highest priority for patrons (*M* = 2.06), librarians felt that instruction or training was their second highest priority. Librarians also held their online databases as a higher priority (*M* = 3.11) than patrons, who valued a place to study (*M* = 3.38) slightly higher. See table 7 for a comparison between what librarians felt were patron goals versus library goals.

Table 7. Highest-Priority Services for Librarians and Patrons

School Library Services	Librarian Priority	Patron Usage
1. Books, journals, and other print material	4.47	4.61
2. Computers or other technology	2.79	3.55
3. Instruction or training	3.53	2.68
4. Studying	1.62	2
5. Online databases	2.47	2.25
6. Technology support	1.48	1.69
7. Meeting space	1.63	1.61

Figures 7 and 8 show librarians and their perceptions of patron priorities in rank order.

Figure 7. Top 5 Library Priorities

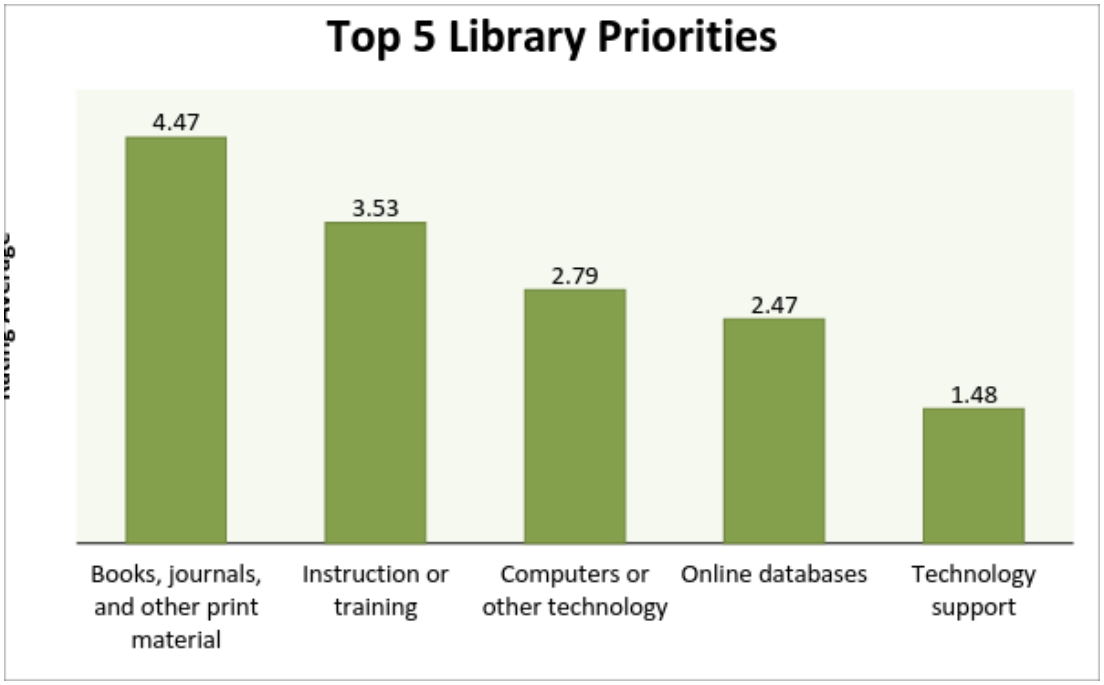
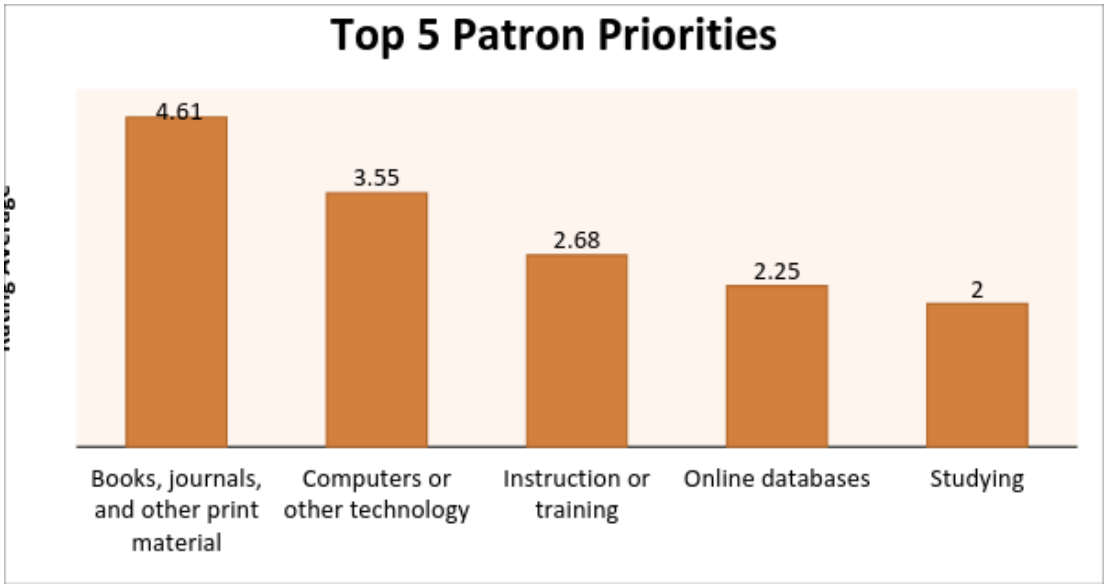


Figure 8. Top 5 Patron Priorities



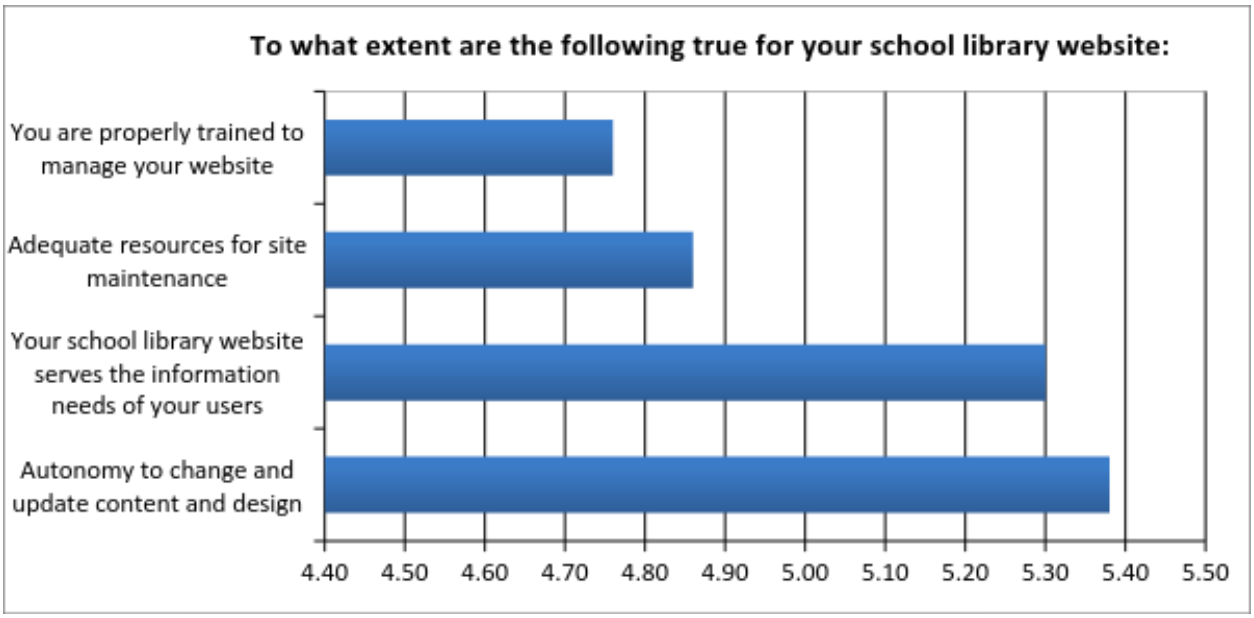
The perceptions of librarians also revealed, however, some disagreement between their priorities and what they perceived as student preferences. Librarians were asked, "What are, in rank order, your library's top five priorities (regardless of user preferences, where 1 = highest, 5 = lowest)? Please only choose five." Social Media, Access to Gaming, and Socializing were ranked the lowest—out of 80 librarians who responded to this question, only 4 ranked Social Media in their top five; only 10 rated Socializing, and no librarians chose Access to Gaming as one of their top

five priorities. They were also asked, "What are, in rank order, the top five school library resources and services (choose only five) for patrons in terms of usage (1 = highest, 5 = lowest)?" The number of librarians who chose these three areas increased, however, not by much: 8 librarians rated Social Media, 5 librarians rated Access to Gaming, and 17 individuals rated Socializing in the top five resources and services for patrons. These results suggest a slight disconnect between what school librarians perceive they should be offering versus what they think students in particular appear to prioritize and want.

Librarians manage their own websites. School librarians, for the most part, develop and maintain their websites (83%), followed by school IT staff (11.5%) and district IT staff (10.3%).

In general, school librarians felt that they had autonomy to change and update their content and design (M = 5.61 out of 7), their websites do a good job of serving the information needs of its users (M = 5.4), they have adequate resources to maintain their site (M = 5.0), and they have the proper training to manage their websites (M = 4.7) (see figure 9).

Figure 9. School Librarian Perspectives on Their Websites



One school librarian stated, however, that the growing demand of her position was making it difficult to spend time on the maintaining the website:

> Since we are in a state of transition, this was difficult for me to answer. When I started my page ten years ago, I received a lot of training and support. I had one planning period a week to update and maintain the site, and there was additional assistance available. In the past five years, I have had additional responsibilities placed on my shoulders, and there has been no compensation for this service or time for maintenance. I was unable to take additional training that would be paid for and supported by either the district or my building. I finally had to pull back because I was leaving later and later from my job, and the web page was apparently one of those tasks that were not viewed as important by my administration (school librarian, 2013).

Discussion

Examining a random sample of urban and rural school library websites across the United States, complemented by input from librarians, has established a picture of what a typical school library website looks like, who it is designed for, how well they compare to best practices recommended by the literature, and how usable they actually are, in relation to the needs of the users and the goals of the library.

1. What Does a Typical School Library Website Look Like?

The study suggests that although there are some common trends, there is really no typical school library website design. There are similarities, however, to an academic or public library website in terms of navigation elements, as two-thirds of the sites evaluated had navigation on the left side of the page or top center of the page, and their name and logo at the top left or center of the page.[xxix] This provides a preliminary starting point in terms of design for school library websites. In terms of services, school library websites tended to provide access to information literacy resources, databases, and online public access catalogs from their homepages. The majority of school library websites, however, did not have library contact information, location, or operating hours on the homepage. Furthermore, access to other expected services were also missing from the majority of websites: library policies, news and events, access to social media, images of the library, access to personal accounts, and ability to renew library materials or to reserve technology or library space for classes or testing.

Our findings support Naughton's findings[xxx] that the majority of school library websites reflected the Reading design and were defined largely by text-delivered data only, which could be problematic for students both in terms of differing reading levels as well as capturing and maintaining their attention. From a usability standpoint, this could lower the overall effectiveness (can't use or find what they are looking for), efficiency (increase in time, mental effort), and satisfaction (few images, icons, and other mental cues outside of text) for students who use their school library websites.

2. Who Are School Library Websites Designed For?

Like most websites, school library websites are designed for multiple groups. School librarians felt that their websites were predominantly designed to serve students, followed by teachers, parents, and administrators, respectively. Our randomly sampled evaluations, however, suggested that the majority of websites were geared more for adult users (e.g., mostly text with very few visual cues), and only a small percentage appeared specifically geared to students. The major services offered were access to books, journals, and other print materials, online databases, access to computers and other technology, instruction or training, a place to study, and a meeting space; technology support and testing were also identified as frequent services. As noted earlier, the majority of website designs appeared to adhere to Naughton's Reading design,[xxxi] which favors adult users rather than youths. Without working closely with youth as design partners, it is very difficult to achieve what Chow, Smith, and Sun refer to as *concept actualization*, or being able to truly reflect and operationalize youth ideas, meaning, and perspectives in sites intended for youth.[xxxii]

Comparing what librarians felt were the highest priorities for patrons with what they felt were the library's highest priorities suggests a high degree of alignment. These primary services also represent a checklist of information that patrons may expect to be included on school library websites. While access to databases and an online public access catalog were found on the majority of school library websites, information about computers and technology, instruction or training opportunities, technology support, and testing were not commonly found.

3. How Do School Library Websites Compare to Recommended Best Practices?

School library websites did not compare favorably to recommended best practices for youth website design. In terms of cognitive design, only one factor—age-appropriate graphics and vocabulary—rated a mean rating of 5.0 (on a 10-point scale), followed by providing access to electronic resources. The following major cognitive factors affecting youth information seeking rated extremely low: use of symbols for concrete object, use of bright colors, well-thought-out and catchy site names, and use of animation or sounds. The only common theme identified for school library websites was the provision of information resources (approximately half of the sites evaluated), which is of course a core function of a website; this suggests many opportunities in terms of age-appropriate web design above and beyond content.

Ratings for affective or emotional design were even lower. Designs featuring factors that encouraged exploration, student input, and social interaction were rated extremely low. The highest-rated factor was reducing cognitive load ($M = 4.6$) due to the tendency of many school library sites to serve as basic information portals or a digital table of contents with just an index of links to choose from but little more in terms of age-appropriate design (e.g., use of icons, animation, color, etc.).

4. How Usable Are School Library Websites?

The usability of school library websites can be viewed from two different perspectives. The first is providing information that is central to the needs of the users and the primary goals of the library. Librarians identified provision of books and other information and databases as their top priority, and over three-quarters of the websites independently examined did provide access to this information. The problem, however, is that information about other major library goals was not typically provided on school library websites. This would suggest that school library websites are only focused on providing information on one primary library goal: books and other information sources.

This is problematic and in contrast with recommended web design standards that identify prioritization of functionality, or what users want from a website, as the central focal point of good web design. The mission of the school library program as articulated by the American Association of School Librarians' *Empowering Learners* is "to ensure that students and staff are effective users of information."[xxxiii] Access to materials addresses only one component of this mission; library websites can do more to "empower students to be critical thinkers, enthusiastic readers, skillful researchers, and ethical users of information," including instruction and support for diverse needs and the development of skills to use, evaluate, and create information and ideas.[xxxiv] Furthermore, websites help publically communicate the mission and value of an organization, and it appears that school libraries are under-utilizing the potential of websites to help educate school communities about all that they have to offer.

The second usability perspective is examining school library websites using general best practices as guidelines for how to develop age-appropriate information spaces for youths. School library websites did not compare favorably to any cognitive, affective, or design conventions. School library websites appear to be driven by content, and although librarians report designing for students, it would appear that this emphasis is focused more on content, best suited for adults and not youths and children, then any of these three dimensions. This most likely impacts the usability of school library websites negatively. Because of the unique needs of youths when seeking information on the web, poorly designed websites will cause a lack of interest and loss of attention, and are often at a reading level that is too high for some users. In addition, other major content areas identified outside of books and traditional information resources that would prove useful for parents, teachers, and administrators were not typically provided at all. Similar to the excitement and independent exploration felt by students exploring a library's physical stacks, an age-appropriate website can do the same for students with digital resources.

Limitations and Future Study

This study also has some limitations to consider. First, the study does not include input from actual school library website users, only school librarians. Feedback from students, teachers, parents, and administrators needs to be collected, which will help determine a respective site's usability and the specific information other user groups are looking for on school library websites. Second is a low sample size and response rate of school librarians; a larger sample will add validity to the study's findings and conclusions. In addition, the results are not differentiated by urban and rural or high school, middle school, and elementary school participants at this time. They have only been analyzed in the aggregate. These results will be sorted and analyzed separately for future publication.

Finally, although this study applies a checklist of youth-centered web design principles to the school library websites, additional considerations may be incorporated into best practices for school library website design, such as curricular objectives, *Standards for the 21st-Century Learner*, district initiatives for reading, literacy, and/or implementation of Common Core State Standards, and considerations for website users with special needs.

Future research will involve re-analyzing the data based on stratifications as well as reaching out to actual school library website users to further triangulate the findings presented here. Directions for related studies may also consider school library website usability as aligned with other priorities for school librarianship and evolving trends in students' technology and information needs, such as usability and access via mobile devices; usability for varied user groups and purposes (e.g., supporting librarian/teacher collaborations or emerging readers); and capacity of school library websites to support students' transliteracy skills, such as creating content and digital citizenship.

Conclusion and Implications

The implications of the study center on taking a broader perspective for effectively providing information on the web and showing how websites may help both facilitate and supplement school library programs. Our findings suggest four main implications for school librarians to consider in terms of their library websites.

Implication 1: School Library Websites Are Not Currently Meeting Their Potential.

There remains untapped potential in how school libraries leverage the web to market its high-priority resources and services, educate the school community, and serve as an information resource for the entire school community. While the provision of quality information still remains first and foremost an essential goal of a good website, contemporary website design requires designers to increasingly understand who their users are, identify what information is most important to them, and provide it as efficiently and effectively as possible since users are increasingly impatient and will give a site little time to provide them the information they are searching for before moving on. School library websites should attempt to ensure that their primary resources and services are clearly presented and in such a way as to speak directly to their adult and student users.

This is a fundamental application of information science, an emerging skill set that all librarians need to pay close attention to as the world and educational settings continue to become more technology enriched. Carefully designed websites can prove to be tireless workers in delivering quality content to their users and helping organizations meet their goals; they are a potentially strong ally in the continuing fight for school libraries and school librarians to be better understood and properly valued by their school stakeholders.

Implication 2: There Are Some Basic Characteristics of School Library Websites.

Our findings suggest that there are some basic common features of school library websites, including placement of navigation (top left or top center) and branding (also top left or top center), and some common content, including access to electronic databases (76%), information literacy resources (77%), and an online public access catalog (62%). Content that is highly recommended for a website homepage but not as frequently found include library hours and contact information, library policies (e.g., check-out duration, overdue fines, etc.), library news and events, and book recommendations and reviews by grade level. All school library websites should consider having these basic features available on their homepage.

Implication 3: Most School Library Websites Are Not Age-Appropriate for Children and Youth.

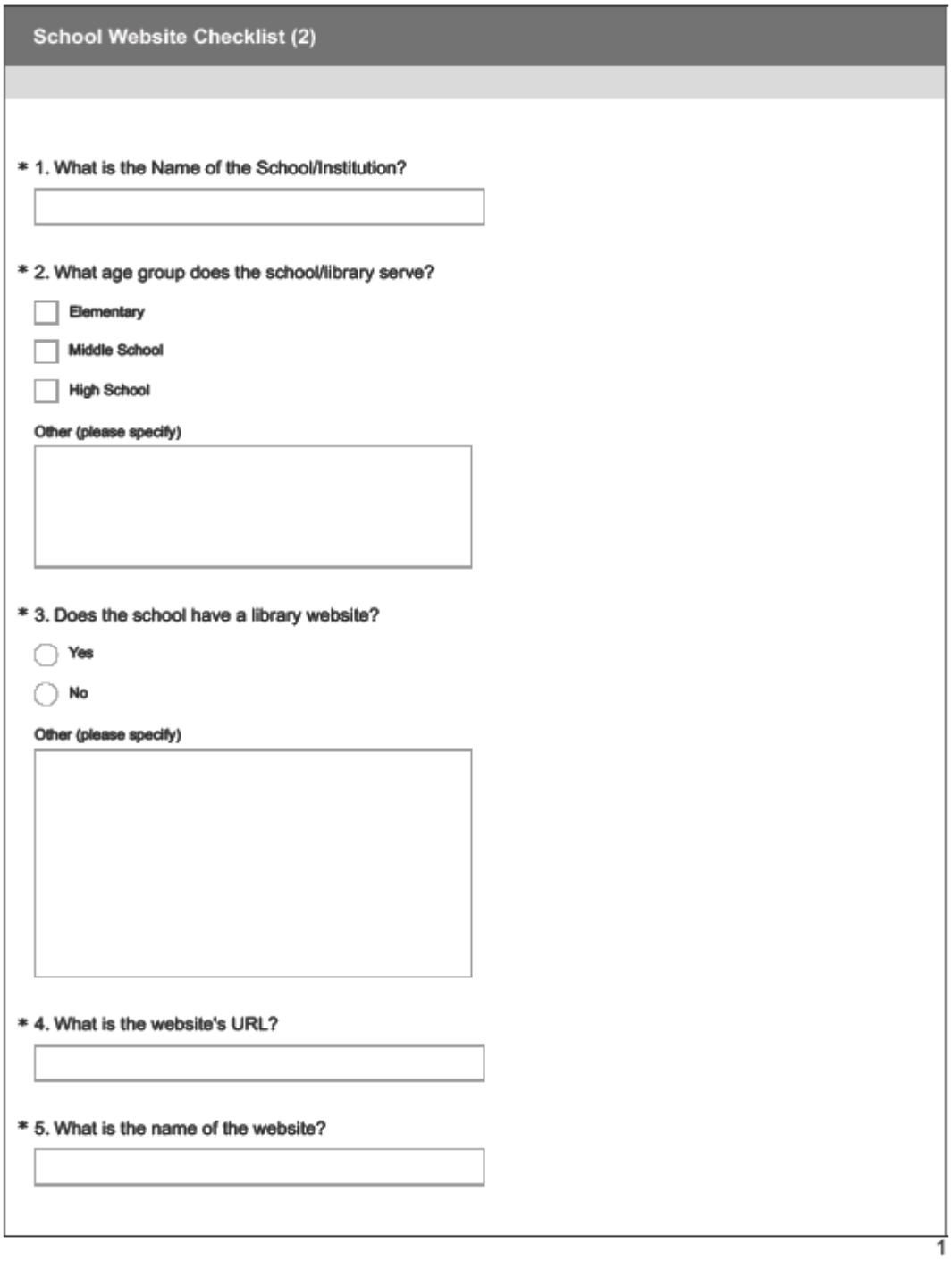
The growing body of research in the area of children and youth information seeking on the web suggests very clear differences in both cognitive ability and preferences based on age. The random sample of websites from across the country evaluated in our study showed very little age-appropriate design as recommended by the literature, which was not a surprise; it is extremely difficult for adult web designers developing youth-oriented web spaces to properly understand the youth perspective, context, and their cognitive and information needs. This presents an opportunity for school librarians who wish to greater capitalize on the power of the web to engage and provide quality information to the entire school community; especially to the students they are serving. School librarians should attempt to engage their stakeholders as design partners as much as possible.

Implication 4: The Need to Develop of Content and Design Guidelines for Age-Appropriate Children and Youth Websites.

One of the core goals for our study was to compare and contrast school library websites with best practices identified in the research literature. While we found a significant opportunity for improvement for most school websites evaluated, it is our sincerest hope that the best-practices design and content tables provided in this paper can serve as a checklist to help school librarians develop more high-quality, engaging, and age-appropriate websites based on cognitive, affective, and design factors. The web has evolved over the years from merely a public space for sharing links of information into a vibrant multimedia rich space with many different purposes. These include marketing and informing others about the organization, being carefully designed to maximize usability for the user based on cognitive and design preferences, and directory structures and channels of information based on the information needs of disparate user groups.

The potential for school librarians to realize the power of the web to its fullest extent is an exciting opportunity to both educate their school communities about what they have to offer while simultaneously increasing their reach in the provision of quality information resources and services to teachers, students, administrators, parents, and the communities they serve.

Appendix A



School Website Checklist (2)

* 1. What is the Name of the School/Institution?

* 2. What age group does the school/library serve?

- [ ] Elementary
- [ ] Middle School
- [ ] High School

Other (please specify)

* 3. Does the school have a library website?

- ◯ Yes
- ◯ No

Other (please specify)

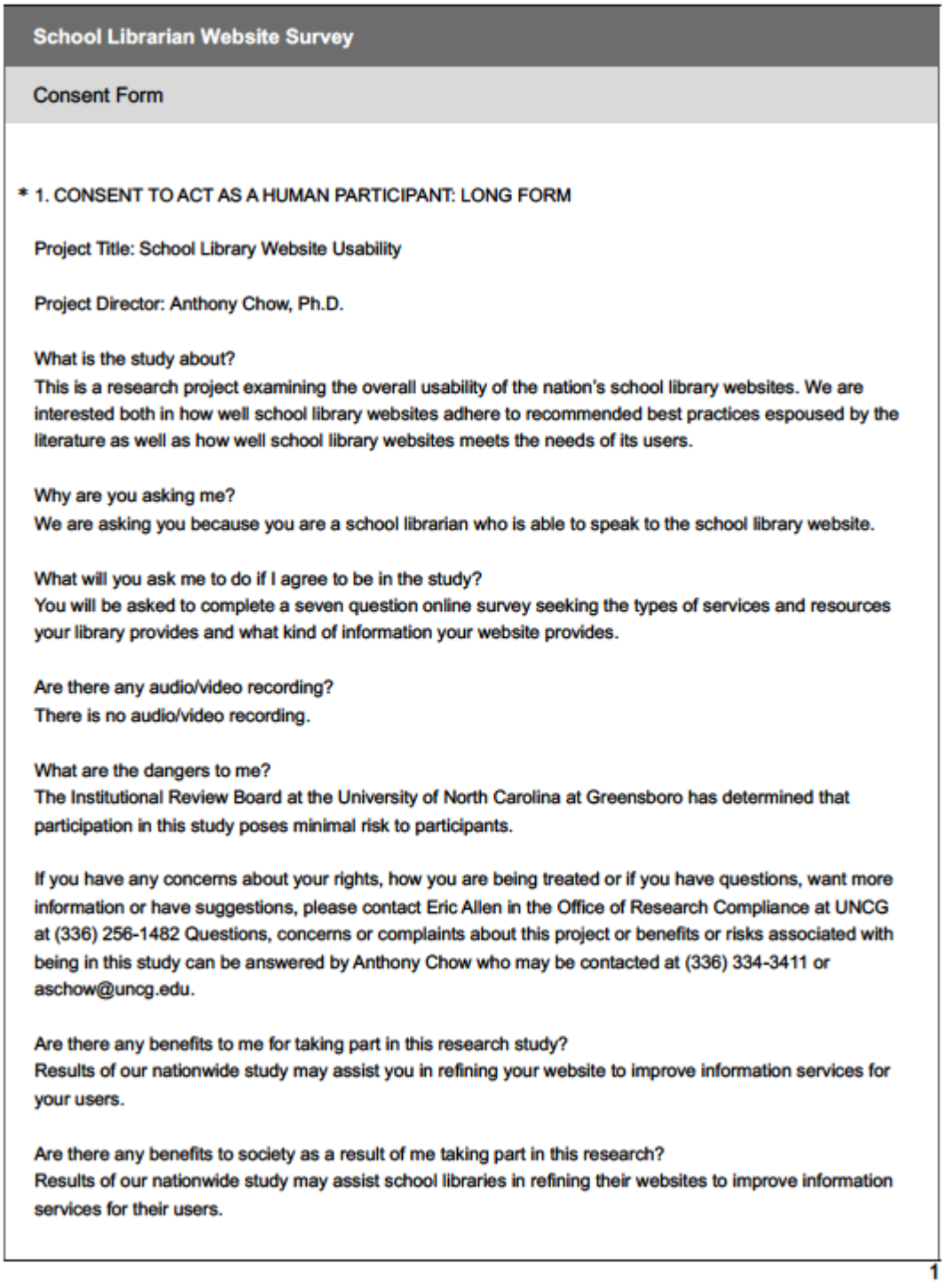
* 4. What is the website's URL?

* 5. What is the name of the website?

1

View the full survey here.

Appendix B



School Librarian Website Survey

Consent Form

* 1. CONSENT TO ACT AS A HUMAN PARTICIPANT: LONG FORM

Project Title: School Library Website Usability

Project Director: Anthony Chow, Ph.D.

What is the study about?
This is a research project examining the overall usability of the nation's school library websites. We are interested both in how well school library websites adhere to recommended best practices espoused by the literature as well as how well school library websites meets the needs of its users.

Why are you asking me?
We are asking you because you are a school librarian who is able to speak to the school library website.

What will you ask me to do if I agree to be in the study?
You will be asked to complete a seven question online survey seeking the types of services and resources your library provides and what kind of information your website provides.

Are there any audio/video recording?
There is no audio/video recording.

What are the dangers to me?
The Institutional Review Board at the University of North Carolina at Greensboro has determined that participation in this study poses minimal risk to participants.

If you have any concerns about your rights, how you are being treated or if you have questions, want more information or have suggestions, please contact Eric Allen in the Office of Research Compliance at UNCG at (336) 256-1482 Questions, concerns or complaints about this project or benefits or risks associated with being in this study can be answered by Anthony Chow who may be contacted at (336) 334-3411 or aschow@uncg.edu.

Are there any benefits to me for taking part in this research study?
Results of our nationwide study may assist you in refining your website to improve information services for your users.

Are there any benefits to society as a result of me taking part in this research?
Results of our nationwide study may assist school libraries in refining their websites to improve information services for their users.

1

View the full survey here.

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[v] Copper, "Developmentally Appropriate Digital Environments for Young Children."

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[xiii] Nielsen, "Usability of Websites for Teenagers"; DiMichele, "Prospective Student Usability Testing."

[xiv] Marc Prensky, "Young Minds, Fast Times: The Twenty-First-Century Digital Learner," www.edutopia.org/ikid-digital-learner-technology-2008 (accessed November 15, 2011).

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The Impact of Social Media on Ghanaian Youth: A Case Study of the Nima and Maamobi Communities in Accra, Ghana

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Abstract

Social media has been widely adopted in the twenty-first century, with high enthusiasm among youth around the world. Research on new media practices in Ghana has been described as wide open, with very few studies focusing on youth social media use. The main objectives of this study were to investigate the extent of social media use and the purposes, access, and challenges of its use by the young people of Nima and Maamobi, two suburbs of Accra, Ghana. One hundred fifty youth ages 11–19 and five adult Internet café attendants participated in the study. The findings revealed patterns of young people's social media use consistent with similar studies of youth in other countries, with high use among the youth in these two economically and educationally disadvantaged communities. The study revealed the need for young people to have a greater awareness of the risks of social media use. The conclusions include recommendations for nationwide education of youth in Ghana about responsible use of social media, with policy and educational interventions led by multiple stakeholders, including school and public libraries and government agencies, to maximize the benefits and minimize the risks of social media use among Ghanaian youth.

Introduction

Social media has been widely adopted in the twenty-first century, with strong enthusiasm among youth. The latest statistics from the Pew Internet Project report indicate that 89% of U.S. Internet users between the ages of 18 and 29 use social media.[i] Statistics on teens' use of social networking sites in Ghana are not available, but 2014 statistics on African Internet usage released by Internet World statistics reveal that approximately 1,630,420 Ghanaians are using Facebook.[ii] This is about 6.6% of the total population of 24,658,823.[iii] This paper reports on a survey conducted in 2014 with 150 youth ages 11–19 from two neighborhoods in Accra, Ghana.

The survey was conducted at five Internet cafés, and an adult operator from each café was also included in the study. Utilizing the Uses and Gratifications theory for framing, the research examined youths' purposes of social media use, as well as their access to social media, how social media use supported their developmental needs, and problems they encountered in using social media. The author finds that use and access patterns among these youth are largely similar to research reported from other countries.

A Short Profile of Nima and Maamobi

Nima and Maamobi are twin communities in the Ayawaso East constituency of Accra. This constituency is located within the eastern part of the Accra Metropolitan Area of the Greater Accra Region of the Republic of Ghana. The two suburbs have been categorized by the Accra Metropolitan Assembly (AMA) as low-income and non-indigenous (dominantly migrant) areas. The populations of Nima and Maamobi are 69,044 and 49,812, respectively. Most inhabitants are engaged in informal businesses such as trading. Their living environment is characterized by poor drainage, inadequate housing, and haphazard development. Buildings include poor-quality material such as mud walls, zinc roofing sheets, and untreated timber.[iv] A report by the Earth Institute Millennium Cities Initiative describes the two suburbs as illegal squatter settlements rapidly undergoing physical and social decay. The report further indicates a high prevalence of both organized and petty crime, leading to stigmatization of residents, especially young people.[v]

Statement of the Problem

Social media offers young people several benefits and opportunities, including access to information, extended social networks, social skills practice, identity expression, informal learning opportunities, interest-based groups, development and maintenance of friendships, and fun.[vi] Social media has been described as an important part of a young person's life and a platform for experimentation, creative self-expression, and identity formation.[vii]

The increased use of social media, or social network sites (SNS), by youth across the world has several risks and consequences. They include privacy concerns such as sharing too much information, posting of false information about themselves or others, exposure to fraudsters and marketers, and addictions to Internet or social media use that might impact negatively on their social, psychological, and emotional well-being.[viii] Other possible negative outcomes are exposure to cyber-bullying; allowing others access to personal information; exposure to inappropriate content, sexting, and outside influences of third-party advertising groups; and sleep deprivation, which can lead to low academic output.[ix]

In Ghana one major concern about Internet use, including use of social media, is cyber fraud, locally known as *sakawa*. Cyber fraud includes using stolen credit cards to make online purchases, conducting online dating scams, and luring contacts to participate in money transfers.[x]

In spite of the prevalent use of social media by young people across the world, few studies have investigated social media use by youth in Ghana, with most of the research focused on issues of national policy and access.[xi] Thus there is a need for youth-centered research on social media use to address this knowledge gap.

Research Questions

The study addresses the following research questions:

- What is the extent of social media use by the youth of Nima and Maamobi?
- What are the purposes for which they use social media?
- How do they access social media?
- What problems do they encounter in the use of social media?

Significance of the Study

This study adds to the knowledge about social media use by youth in Ghana. The findings inform government and other stakeholders about trends in young people's social media use and problems associated with use and suggest measures to promote effective and responsible use of social media among youth while mitigating the risks associated with its use.

Theoretical Framework

This study was informed by Uses and Gratification theory, which suggests that people actively choose their media based on their needs. In other words, people's choice of media is highly influenced by their needs and the gratifications or satisfaction they get by using these media.[xii] Five main categories of needs have been identified based on the social and psychological functions of mass media. They include cognitive, affective, personal integrative, social integrative, and escape and diversion needs.[xiii]

This study adopts Uses and Gratifications theory as a theoretical framework for the following reasons:

- It has previously been used successfully to examine the underlying reasons for media use to satisfy particular needs.
- It has previously been used successfully to understand consumers' motivations and behaviors in the use of traditional media such as TV and radio.

Researchers are currently using this theory to examine the extent of use, motivations, and gratifications for the exponential use of new media including social network sites (SNS).[xiv]

A number of studies have applied Uses and Gratifications theory in investigating social media use. For example, Whiting and Williams identified ten uses and gratifications related to people's social media use: entertainment, communication, expression of opinions, surveillance/knowledge about others, information sharing, relaxation, social interaction, information seeking, pastime, and convenience. The theory has been applied by Karimi et al. to compare the motivations for use of SNS by higher-education students from Iran, Malaysia, the United Kingdom, and South Africa.[xv] Other work has shown that motivations for joining SNS include keeping in touch with friends, getting to know more people, networking, finding academic course information, and meeting people with mutual interests.[xvi]

Literature Review

Definition of Terms

Social media are "forms of electronic communication (as web sites for social networking and micro blogging) through which users create online communities to share information, ideas, personal messages, and other content (as videos)."[xvii] A closely related phrase is social network site (SNS), which is defined as "a networked communication platform in which participants (1) have uniquely identifiable profiles that can consist of user-supplied content, content provided by other users, and/or system-provided data; (2) can publicly articulate connections that can be viewed and traversed by others; and (3) can consume, produce, and/or interact with streams of user-generated contentment provided by their connections on the site."[xviii] In this paper, the terms "social media" and "social network sites" are used interchangeably. Some of the most popular SNS include Facebook, Twitter, LinkedIn, Pinterest, Google+, Tumblr, Instagram, Flicker, Vine, Meetup, Ask.fm, meet me, Snapchat, vk.com, Tagged, Classmates, MySpace, YouTube, Picasa, the Student Room, the Math Forum, CyWorld, LunarStorm, WhatsApp, Skype, Yahoo Messenger, MSN Messenger, and so on.[xix]

Trends in Youth Social Media Use

A Pew Research Center report from 2013 finds that Facebook is the most preferred social media platform of young people in terms of numbers of registered users.[xx] A 2015 Pew report indicates that 71% of U.S. teens ages 13–17 use Facebook. Other social media sites used by this demographic group are Instagram (52%), Twitter (33%), Google+ (33%), Vine (24%), and Tumbler (4%).[xxi] Some studies have reported a more recent decrease in the enthusiasm of young people's use of Facebook as a result of increasing adult presence, the stress of managing their reputations on Facebook, and excessive sharing of content by their friends.[xxii]

Young people in America use social media sites for many and varied purposes, including posting profiles, videos of themselves, relationship statuses, personal interests, and comments on friends' content; sharing personal information such as birth date, e-mail address, school name, cell phone number, pictures, and so on. Additional purposes include keeping in touch with friends, developing contacts, consuming content (such as watching music video and advertisements), browsing through profiles, exploring self-identities, sending instant messages or text messages, and joining groups.[xxiii]

Another recent Pew Research Center report finds that the majority of U.S. teens (92%) post their real names to their Facebook profiles, followed by posting their interests (84%), birth dates (82%), relationship statuses (62%), and videos of themselves (24%).[xxiv]

Another U.S. study explored the use of SNS as a source of information for teens. It investigated the question-asking-and-answering practices of 158 high school students on popular social networking sites. The findings revealed that the participants asked questions to satisfy 28 categories of information needs. The majority of the questions (76%) were school related, suggesting that social media can be a major source of information for answering the questions teens care about, especially school-related information.[xxv]

A study by Boniel-Nissim and Barak suggests that social media use can be therapeutic. Their study examined the effect of blogging on adolescents with social-emotional difficulties. The findings showed that generally open blogging had a greater and significant effect on participants, irrespective of subject content, when compared with blogs that were closed to readers' comments. Their findings posited that Internet-based blogging is a viable intervention to help adolescents with social-emotional difficulties. The researchers also saw it as an enhanced form of writing diaries, since it offers the writer not only text, but pictures, movies, and links to other web pages, while expressing themselves, sometimes anonymously.[xxvi]

A few studies in Africa have discussed various aspects of social media use by youth. For example, a South African study reveals that young people use social media as a source of political, social, educational, economic, and cultural information.[xxvii] Kassam discusses the role of digital social media in teaching Kenyan students responsible citizenship in a democracy. He mentions that skills—such as having respect for all irrespective of race, ethnicity, and socioeconomic status, taking a moral stance on issues, showing concern for others, and possessing the ability to argue respectfully with others—can be taught in the classroom without access to social media. However, he argued that in the broader context of knowledge acquisition and communication within and outside the country, it is important to include digitized media technologies in the curriculum to impart critical media literacy skills to students. Such skills can help prevent mass violence, protests, and demonstrations, which can be caused by students disregarding their civic responsibilities and not respecting the rights of others.[xxviii]

A qualitative study of Facebook use among young people ages 17–23 in Viwandani, a slum in Kenya, reports that youth accessed Facebook at Internet cafés and on their cell phones. They used Facebook to communicate with their friends and relatives abroad, to monitor the social status of their friends, to look for romantic partners, to access short-term job opportunities through friends, to market their businesses, to keep up with fans, to seek remittances from friends and family members abroad for emergencies, and to read Bible verses posted by friends. They regretted the limited time they were able to spend on Facebook because they lacked money to pay for Internet access at cafés or to buy airtime for data use on their phones.[xxix]

A Nigerian study involving 932 polytechnic students between the ages of 15 and 29 years reveals that the students preferred to use Facebook and WhatsApp to share information; communicate with friends; access movies, photos, and music; search for jobs; propagate their religion; and conduct business.[xxx] Similarly, a Mauritius study involving 4,545 secondary students reports that the teens preferred Facebook for keeping in touch with friends and family members, making new friends, discussing schoolwork, and sharing photos, music, and videos with their friends.[xxxi]

According to Davies and Cranston, youth are at risk in engaging with strangers in their social media use, which might lead to serious consequences such as sexual abuse.[xxxii] However, Madden et al. report that teens' Facebook friends are a reflection of their offline social network of friends. In other words, they know most of their Facebook friends personally. They include friends from their school and other schools, and friends of members of their extended family, parents, and siblings. Other Facebook friends are teachers, coaches, and celebrities such as musicians and athletes.[xxxiii]

Existing findings suggest that youth spend varied amounts of time on SNS. For example, 43% of 100 young people between the ages of 10 and 24 who participated in a Swaziland study used social media sometimes, 40% used it always, and 17% used it often.[xxxiv] The Nigerian study revealed that a majority of the students used social media more than five hours per day.[xxxv] With regard to the Mauritius study, 52% of the respondents accessed SNS daily, 35% weekly, 6% twice a month, and 7% once a month.[xxxvi]

There are many problems and risks associated with youth social media use. One of the major risks is cyberbullying. Cyberbullying is the act of posting hurtful, false, and embarrassing information about another person.[xxxvii] A Pew Research Center report on cyberbullying indicates that 32% of online teens had experienced or participated in some form of online harassment, such as spreading malicious rumors; forwarding private material like pictures via e-mail, text, or instant messaging without permission; or receiving threatening messages.[xxxviii] Drussell has emphasized that there is a need to pay attention to cyberbullying because of the detrimental effects on victims, including feelings of depression, guilt, and shame, which can lead to self-harming and withdrawal from family and friends.[xxxix]

O'Keeffe and Clarke-Pearson also highlight the consequences of some identified risks of youth social media use such as sexting as well as privacy issues.[xl] Sexting is using digital devices such as computers and cell phones to send, receive, or forward sexually explicit photographs, images, or messages. These images can then be shared and distributed rapidly. About 20% of teens have reportedly sent or posted nude or semi-nude photographs or videos of themselves. The consequences of sexting include emotional stress and accompanying mental health conditions for perpetrators, school suspensions, and in some cases (in the United States) child pornography charges. Lenhart explains that sexting in itself is not a form of harassment; it is when the images are shared that the senders become victims of bullying and harassment.[xli]

Activities that put young people's privacy at risk include sharing vital personal information and posting false information about themselves or others. O'Keeffe and Clark-Pearson emphasize that teens can be ignorant of their digital footprint—the record of their web activities—and the fact that whatever they post online becomes a permanent record.[xlii]

The participants of the Swaziland study also indicated several harmful effects of social media use on youth, including addiction to SNS use, antisocial behavior, exposure of underage users to pornography and immoral language, falling standards of both spoken and written English as a result of the use of colloquial language on social media, and the shirking of household chores in favor of social media use.[xliii]

Nonetheless, an analysis of a national survey of 1,511 UK children ages 9–11 revealed a positive relationship between online opportunities and online risks. In other words, young people who are skilled in using the Internet and thus make the most of the opportunities available on the Internet are also more vulnerable to the risks associated with its use.[xliv] It is therefore important for young people to learn to navigate away from the risks, while making the most of the opportunities offered by social media.

Related Literature in Ghana

A review of the literature revealed that few empirical studies have investigated the use of social media by youth in Ghana. The bulk of this literature involves discussions by ordinary Ghanaians and opinion leaders in the print media of the negative effects of social media. For example, Amofah-Serwaa and Dadzie investigated social media use and its implications on child behavior in a basic school. Their findings show that all participants were aware of social media and used sites such as Facebook, Twitter, WhatsApp, Yahoo Messenger, and Skype to communicate with friends and family and for entertainment purposes, including watching videos and playing games. Both teachers and parents were aware of pupils' use of social media. However, parents had no knowledge of their children's social media friends. With regard to the influence of social media on the behavior of students, 48% indicated that they had not been affected by what they saw online, 2.5% felt that their learning had been positively affected, and 23.3% said that they could not concentrate fully on their studies. Over 70% of parents answered that their children had become friendlier and their dressing, speech, and reading habits had improved. The negative effects noticed by parents included inappropriate dressing, unorthodox hairstyles, distractions from learning, and use of jargon or Pidgin English by their children. The participants made suggestions on how to mitigate the negative effects of social media. Teachers advocated control of students' social media use and formulating policies to ensure responsible use of social media. Parents suggested that social media be used for academic purposes only, at specific times under parental supervision, with enforcement of censorship in social media use.[xlv]

Another study investigated social media participation and its effect on the academic performance of students in four senior high schools in Ghana. The findings revealed WhatsApp and Facebook as the students' preferred social media. Purposes for using social media included making friends (41.4%), discussing school-related matters (30.5%), and entertainment (15.8%). Others shared and discussed exam questions with friends. Students spent varied amounts of time online each day. Thirty-eight percent of respondents spent more than 8 hours, 25.8% 1–2 hours, 21% 3–5 hours, and 15.8% 6–7 hours or 8–12 hours daily. Some respondents (38%) indicated that they use social media during school hours. The negative effects of social media on students' performance included reduced time for studying, distraction from schoolwork, and procrastination in completing assignments. Other negative effects included poor grammar and spelling, incorrect sentence construction, and falling grades. In spite of these negative effects, 45.1% of respondents felt that use of social media had improved their reading skills.[xlvi]

Thus, the limited literature on the use of social media by youth in Ghana shows that social media offer young people a platform for self-identity, self-expression, creativity, and networking. The literature also captures concerns for the erosion of Ghanaian culture and falling standards in education, especially in use of the English language, as a result of exposure to and use of social media by young people in Ghana. There have been calls for educating youth to raise awareness of the risks associated with using social media and to promote responsible use. There is a need for more research to investigate the effects of social media use on young people in Ghana, especially its effect on Ghanaian traditions and culture among youth.

Methodology

The study used the mixed-method approach to generate more complete data and provide a better understanding of the research problem.[xlvii] It was conducted in the Nima and Maamobi communities in Accra, the capital city of Ghana. The researcher first conducted an informal survey in December 2013 to identify and select Internet cafés for the study. She visited a total of forty Internet cafés to observe patronage by youth who fell within the age range (11–19) for the study. This was done by unobtrusively counting the number of young people in each café at the time of the visit. The survey revealed several Internet cafés in the study area, coupled with a large population of youth often found browsing the Internet at these cafés or on their phones after school or during break periods. Five cafés with the highest number of youth were selected for the study.

The cafés are of different sizes and are equipped with secondhand desktop computers, ranging from 3 to about 65 computers, with broadband Internet connections, tables and chairs, fans, and a few with air conditioners. They provide a range of services such as printing, photocopying, scanning, computer repair, networking, Web design, and telephone services, and a few sell drinks and pastries on the side. They have varied opening and closing hours, and a few offer 24-hour services. The youth patronize the cafés daily after school hours, Monday to Thursday, Friday after Muslim prayers (12:00 p.m.), and on the weekend. The majority of the residents of these communities are Muslim and therefore attend Friday prayers.

The study population comprised all the youth and five Internet café staff ("operators") in the Nima and Maamobi communities. Convenience sampling was used to select 150 young people ages 11–19 years from five Internet cafés in the study locations. Operators of these five cafés were also selected as study participants.

Convenience sampling was adopted for the selection of study participants because of several factors, including lack of statistics on the youth population in the two communities, the limited time available for the completion of the study, and lack of statistics on youth attendance at the cafés. (Café operators do not collect attendance statistics for their operations. They depend on café software known as Handy Café, which records sales only.) Thirty volunteers were selected from each café to participate in the study.

Data was collected in June 2014. The main data collection instruments were questionnaires and interviews. The questionnaire was designed to collect demographic information, frequency of SNS use, purposes for use of social media, social media preferences, access to social media, effect of social media on developmental needs, and problems with social media use. It was pretested on ten participants in order to correct poorly worded and ambiguous questions, unclear choices and instructions, and so on.

The questionnaire was administered by the researcher at each café after following the appropriate ethical procedures such as explaining the purpose of the study and seeking the consent of participants. She was at hand to answer participants' queries and to clarify any of the study's questions that they did not understand. The café operators were interviewed about statistics on youth patronage, young people's purposes for using the Internet cafés, knowledge of filtering

systems, types of software used in monitoring the café, knowledge about cyber crimes, and the minimum age of people allowed to use the cafés.

The main problem encountered in the collection of data was relative unavailability of the participants during the time of data collection. Most of the young people were preparing to write their final Basic Education Certificate Examination (BECE), which begins in June; therefore, they were not coming to the cafés regularly. Those using the cafés were often not willing to complete the questionnaire, with the excuse that they were studying for their exams. This necessitated a number of visits to the cafés before the target number of participants was reached. In spite of these problems, the quality of the data did not appear to be compromised in any way, as those who agreed to complete the questionnaire were very responsive and supportive.

Results

Background of Participants

The participants were asked to indicate their age, gender, educational level, and occupation of parents. The results (table 1) show that most of the respondents were males (68%), between the ages of 17 and 19 (50%), and attended secondary schools.

Table 1: Summary of Respondents' Background

CATEGORIES	*N* = 150				
Gender	Male (68%)	Females			
Age groups	11–13 years	14–16 years	17–19 years	No response (4.6%)	
Education	Upper	Junior HS	Senior HS	Tertiary (18.0%)	No response

Parents'	Trader	Farmer	Civil servant	Commercial driver (7.3%)	Other

The majority of their parents were self-employed and mostly worked as traders (44.6%), with a few working as commercial drivers and farmers. The next largest group (28.0%) was government workers or civil servants.

Use of Social Media

The respondents were asked to indicate whether they had profiles on any SNS. The results showed that social media is popular among the youth visiting Internet cafés in the two communities, where 76% of respondents had profiles, 8% did not, and 8.6% did not respond.

They were further asked to indicate the types of social media they used. The results (table 2) showed that Facebook and WhatsApp were the most popular SNS among the participants by 83.3% and 70.6%, respectively. Other SNS used by study participants in descending order were Yahoo Messenger, Twitter, YouTube, Skype, and MySpace.

Table 2: Social Media Profiles of Respondents

N = 150		
Categories	**Number of users**	**Percentage**
Facebook	125	83.3%
Twitter	40	26.6%
WhatsApp	106	70.6%
YouTube	36	24%
Skype	24	16%
Yahoo/MSN Messenger	43	28.6%

MySpace	10	6.6%

Frequency of Use of Social Media

The participants were asked to indicate the frequency with which they used different SNS, whether they used SNS daily, three times a week, once a week, or occasionally. The results (table 3) show that Facebook and WhatsApp were used much more frequently than the other SNS. For example, 60% and 44% of respondents indicated they used WhatsApp and Facebook, respectively, compared to 16% and 6.6% of respondents who said they use Yahoo Messenger and Twitter.

Table 3: Frequency of Use of Social Media

N = 150				
Categories	**Daily**	**3 times a week**	**Once a week**	**Occasionally**
Facebook	66 (44%)	30 (20%)	12 (8%)	11 (7.3%)
Twitter	10 (6.6%)	14 (9.3%)	7 (4.6%)	9 (6%)
WhatsApp	90 (60%)	9 (6%)	1 (0.6%)	6 (4%)
YouTube	8 (5.3%)	16 (10.6%)	6 (4%)	5 (3.3%)
MySpace	3 (2%)	4 (2.7%)	3 (2%)	3 (2%)
Skype	6 (4%)	6 (4%)	6 (4%)	6 (4%)
Yahoo Messenger	24 (16%)	9 (6%)	5 (3.3%)	10 (6.6%)

Hours Spent Using Social Media

Respondents were also asked to indicate how many hours they spend each day using SNS. The findings showed that 10% of respondents spent less than an hour per day, 52% 1–3 hours, 13.3% 4–6 hours, and 1.3% 7–9 hours per day on SNS. Also 7.3% of the respondents spent 10 hours or more a day on social media. The hours spent by youth in the current study are higher than those reported in other studies. A similar study involving Somali youth ages 21–30 reported that 30.9% spent 1–2 hours daily on Facebook, 24.4% 2–3 hours, 19.9% less than an hour, 12.9% more than 4 hours, and 11.9% between 3–4 hours.

Purpose for Use of Social Media

To determine the uses and gratifications that youth derive from using SNS, respondents were asked to indicate the purposes for which they used social media. The results (table 4) show that the respondents primarily used social media for staying connected, which included chatting with old friends (74%), making new friends (73.3%) and staying in touch with family members (62.6%).

Table 4: Purposes for Use of Social Media

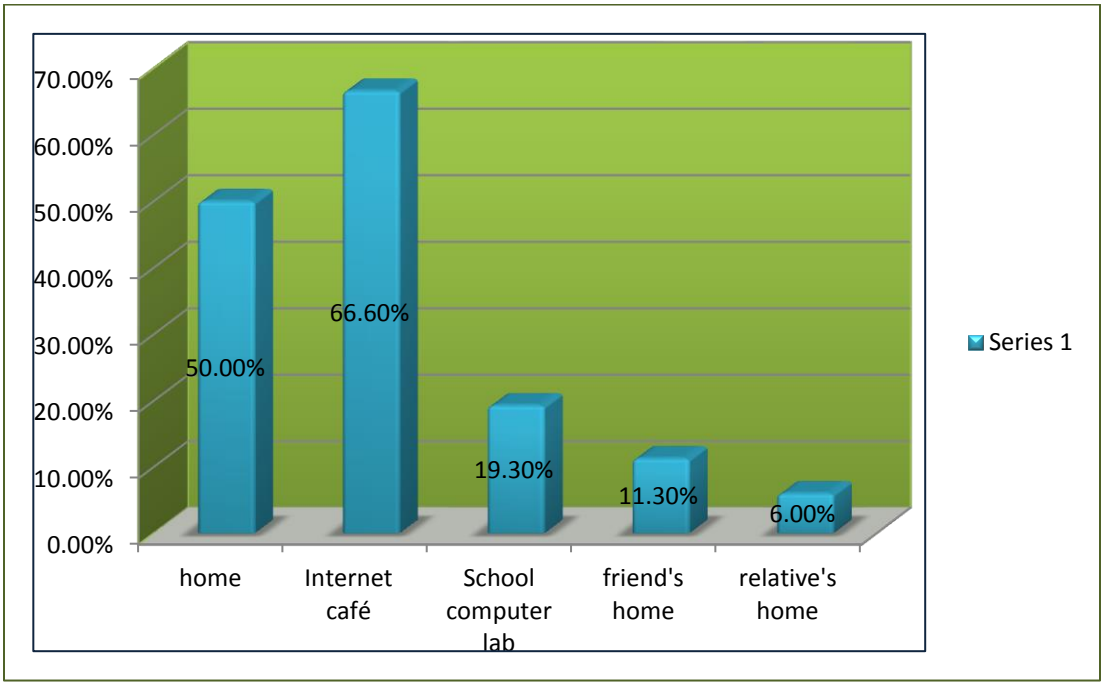
N = 150				
Purposes	**Activities**			
Staying	Making new friends: 110 (73.3%)	Chatting with old friends: 111 (74%)	Staying in touch with family members: 94 (62.6%)	
Entertainment	Watching movies/videos: 58 (38.6%)	Playing games: 38 (25.3%)	Watching sports: 45 (30%)	Listening to music: 66 (44%)
Sharing	Posting/updating statuses and timelines: 60 (40%)	Sending messages: 112 (74.6%)	Posting/updating profiles: 59 (39%)	Uploading/ downloading videos: 46 (30.6%)
Education	Keeping up to date with current affairs: 61 (40.6%)	Sharing/discussing school-related information: 80 (53.3%)	Learning about topics of interest: 42 (28%)	Learning new technological skills: 45 (30%)
Business	Shopping: 23 (15.3%)	Promoting/doing business: 30 (20%)	Other: 8 (5.3%)	

Other purposes included entertainment, such as listening to music (44%) and watching movies (38.6%) and sports (30%); sharing content, such as sending messages (74.6%), and posting and updating statuses and timelines (40%); education, such as sharing or discussing school-related information (53.3%) and learning about new topics of interest (28%) and new technological skills (30%); and finally promoting/doing business (30%) and shopping online (15.3%).

Access to Social Media

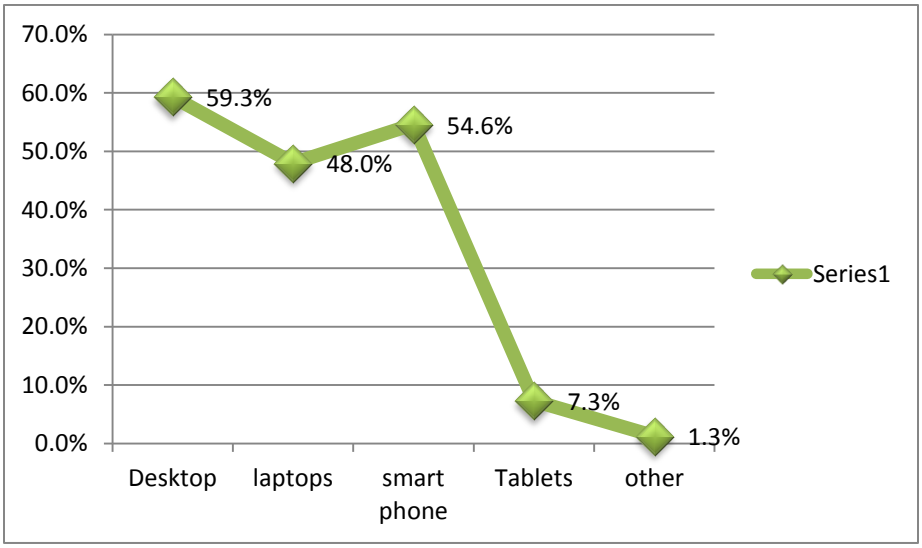
The respondents were asked to indicate how and where they accessed social media sites. The results (figure 1) show that they mostly accessed social media from Internet cafés (66.6%) and their homes (50.0%).

Figure 1: Access to Social Media



The findings of the study further revealed that the respondents accessed social media through various technological devices (figure 2) including desktop computers (59.3%), smartphones (54.6%), laptops (48%), and tablets (7.3%).

Figure 2: Devices for Accessing Social Media Sites



Satisfaction of Developmental Needs

The Uses and Gratification theory indicates that people's choice of media is highly influenced by their needs and the gratification, or satisfaction, they get by using those media Also social media has been associated with several benefits for adolescent development, such as identity formation, creative self-expression, and development and maintenance of new friendships. Therefore, the respondents were asked to indicate the types of developmental needs that had been satisfied by their use of social media. The majority of the respondents (table 5) indicated that their friendship needs (68.6%) had been met, followed by social relationships need (56%), need to learn and discover new things (48%), and need for family attachment (46%). A few of the respondents indicated (in descending order) that their need to freely express themselves (self-expression), to be accepted by their peers, to be loved and shown affection, to be shown recognition (self-esteem), to freely express negative thoughts, and to have some romance have been met by their use of social media.

Table 5: Satisfaction of Development Needs

N = 150		
Activity	**Frequency**	**Percent**
Self-expression	32	21.3%
Social relationships	84	56%
Friendship	103	68.6%
Love and affection	30	20%
Acceptance by peers	32	21.3%
Romance	15	10%
Recognition (self-esteem)	28	18.6%
Need to express negative feelings	19	12.6%
Family attachment	69	46%
Learn and discover new things	72	48%

Problems Encountered in Using Social Media

The review of the literature revealed several risks/vulnerabilities and problems associated with the use of social media by young people; therefore, the study sought to find out whether participants of the study had similar or different encounters while using social media. The results show that the main problems (table 6) indicated by the respondents are unreliable power supply (59.3%), followed by unwanted friendship requests (42.6%) and lack of Internet access (37.3%). A few of the respondents also listed unwanted sexual advances from adults, low Internet bandwidth, lack of concentration at school, and sleep deprivation.

Table 6: Problems Encountered in Using Social Media

N = 150	
Nature of problems	**Frequency**
Unreliable power supply	89 (59.3%)
Unwanted friendship requests	64 (42.6%)

Lack of Internet access	56 (37.3%)
Unwanted sexual advances from adults	23 (15.3%)
Low Internet bandwidth	22 (14.6%)
Lack of concentration at school	19 (12.6%)
Sleep deprivation	18 (12%)

The survey also addressed the types of cyberbullying incidents the respondents had encountered in their use of social media. The results (table 7) revealed that 48% had experienced mean, offensive, or hurtful messages either from one-on-one contact or in a chat room, and 21.3% had experienced name-calling in a chat room. Another 52% of respondents had encountered fake profiles on social networking sites, and a further 12.6% of the respondents had encountered people spreading rumors online.

Table 7: Cyberbullying Incidents

N = 150	
Incidents	**Frequency**
Offensive message	72 (48.0%)
Name-calling	32 (21.3%)
Fake profiles	78 (52.0%)
Spreading rumors	19 (12.6%)

Findings from Café Operators

All five cafés used monitoring software called Handy Café software, which generated log-in codes for users, monitored computer-use time allotments, and automatically logged users out. Handy Café generated statistics concerning sales quantities and hours of Internet use but did not log personal statistics about users, such as age or gender. Thus, the café operators did not have access to accurate statistics indicating the number of young people who used their services or their demographic characteristics.

Of the five operators, only two had knowledge of filtering systems. One of them indicated that they had a technical team in charge of their network and so there was a filtering system in place that blocked inappropriate content such as pornography from their networks. Generally, they had no restrictions on the age of patrons with the exception of one operator who said that the café accepted children from age 12. He, however, mentioned that sometimes children below 12 years accompanied their older siblings to the café to learn how to play online games.

With regard to the purposes for which youth patronize their cafés, the operators confirmed some of the findings from the respondents, such as chatting with friends and family members, looking for new friends (especially foreigners), doing assignments, and watching and uploading videos. One of the operators emphasized that as a rule their role is to provide the service and not to meddle in the private affairs of their patrons, including what they do on the Internet.

Discussion of Results

The findings indicate that most of the participants' parents were self-employed. They worked as traders, farmers, and commercial drivers, vocations implying that the respondents come from poor backgrounds. This is not surprising, since most of the residents in the study location are low-skilled migrants. This is confirmed by the Accra Metropolitan Assembly (AMA), which has categorized the area as low income and non-indigenous.[xlviii] It can also be concluded that youth who patronize Internet cafés and are therefore likely to use social media in the Nima and Maamobi communities of Accra are secondary students between the ages of 17 to 19 years and from poor backgrounds.

Social media is now a common media platform for youth around the world, including participants of this study. The results reveal that 76% of respondents use SNS. This popularity can be ascribed to the many benefits, or uses and gratifications, that youth derive from it, such as building friendships and communicating with friends both offline and online, entertaining themselves, building their own content, and exploring their self-identities. For these young people from poor backgrounds with limited opportunities at home, social media offers an opportunity for personal and educational advancement, and many try to take the best possible advantage of it. The popularity of social media use among the youth of the current study is consistent with the results of other studies. For example, a 2010 Pew Internet Project report indicates that 73% of online teens use social media.[xlix] An Indian study also reported that majority of Indian youth are members of one or more social media sites.[l] It is remarkable that the study participants are from poor backgrounds with low-quality educations and yet are avid users of social media. This finding stands in contrast with those of a recent Pew Research Center analysis of 27 nationwide surveys on use of technology by the U.S. public from 2005 to 2015.[li] The analysis revealed socioeconomic differences in social media use. In the past decade, those living in affluent or high-income households and those with a college education were consistently more likely to use social media than those with only a high school education or lower.

The preferred social media of the study participants were Facebook and WhatsApp. It is probable that participants are using these two media to stay connected with friends, since some study reports reveal that Facebook and WhatsApp are generally popular among young people. For example, Madden et al. reports that 81% of online teens in the United States maintain profiles on Facebook, and a news item by Digital Media Asia found that about 69% of teens in Africa are using WhatsApp.[lii]

The findings on the frequency of use of social media show that WhatsApp is used much more frequently on a daily basis than Facebook. This may be ascribed to the fact that WhatsApp is readily accessible from mobile phones without any log-in information. It also has call and messaging features, which are useful in communicating with friends and family members. In Ghana, using these features on WhatsApp is much cheaper than buying phone units to make calls or send text messages. Money spent on purchasing airtime is so high that "flashing" is popular among phone subscribers. A user "flashes" a contact by dialing his number and allowing the phone to ring only once or twice before hanging up. This is done to notify a contact to call back. The participants in the study may be using WhatsApp more frequently than other SNS to take advantage of its free chat and call features.

The findings also reveal that 1.3% of the respondents spent 7–9 hours a day using SNS and that 7.6% of them spent over 10 hours. Students spending this much time on SNS will have less available time for schoolwork, which can affect their academic performance. A Ghanaian study of the effects of social media use on school performance reveals that prolonged use leads to reduced time spent on schoolwork and procrastination in completing assignments.[liii]

The study found that the respondents accessed social media via smartphones and desktop computers. As the young people were from poor backgrounds, they may not have had access to computers at home. Also, statistics from the last Ghana population census in 2010 revealed that only 7.9% of the 24,658,823 people in Ghana owned a desktop or a laptop computer.[liv] This explains the high patronage of Internet cafés by youth in the study. It is not surprising that 54.6% of the respondents indicated that they accessed social media via their smartphones, as mobile phone ownership is quite high in the country. Census data on mobile phone ownership indicates that about 73.5% of the 4,010,054 residents in Accra age 12 years and above own a mobile phone.[lv] It seems that this proportion nationwide has been increasing; statistics from the National Communications Authority showed that by the end of December 2015, there were 35,008,387 mobile voice subscribers in the country with a penetration rate of 127.63%.[lvi] The number far exceeds the total population because it is commonplace to meet people with more than one phone subscription. Many users maintain multiple subscriptions as a means of controlling costs and also to have a fallback when one of the service providers goes off air temporarily, which is a common occurrence. It is also cheaper to speak to a contact on the same network. Sey is of the opinion that the mobile phone is no longer a preserve of the rich, because there are affordable ones on the market, so both the rich and poor can afford to own a mobile phone.[lvii] That explains why the youth in the study can afford to own mobile phones and use them to access their favorite SNS.

Respondents reported unreliable power supply and lack of Internet access as problems encountered in using social media. Ghana was experiencing a protracted power-supply crisis at the time of the study. It led to the introduction of scheduled load shedding by the power utility to regulate supply.[lviii] Lack of Internet access may also be attributed to the low economic status of most of the respondents. Many could not afford Internet access in their homes.

The findings also show that youth in the study had encountered some cyberbullying in their use of social media, including mean, offensive, or hurtful messages, name-calling in a chat room, fake profiles, and spreading of rumors on SNS. This finding is similar to those of other studies. For example, a 2007 Pew Internet Project report stated that one in every three online teens have experienced online harassment.[lix] About 32% of all teenagers who use the Internet reported that they have been targets of a range of annoying and potentially menacing online activities, such as receiving threatening messages and having embarrassing pictures posted without their permission. Drussel warns that cyberbullying must be taken seriously since it can be detrimental to its victims and may lead to feelings of depression, guilt, and shame, as well as self-harm and withdrawal from family and friends.[lx]

Theoretical Interpretation of the Study

The study adopted the Uses and Gratification theory, which postulates that people's choice of media is highly influenced by their needs and the gratification or satisfaction they derive by using those media. One of the assumptions of the theory is that people are able to verbalize their motivations for their choice of media, that is, their reasons for using the media. The youth in this study were able to identify their uses and gratifications for social media use when asked to indicate the purposes for which they used social media.[lxi] They are discussed based on the uses and gratification categorizations of Elihu et al.[lxii] and Whiting and Williams.[lxiii] They include the following:

- *Social interaction:* Seventy-four percent of the respondents indicated that they use SNS to chat with old friends.
- *Communication utility:* Over 62% of the respondents responded that they use SNS for staying in touch with family members, and 74.6% used it to send messages.
- *Entertainment:* Respondents said they used SNS for listening to music, watching movies/videos and their favorite sports, and playing games.
- *Sharing information:* Forty percent and 39% of the respondents used SNS to post their statuses and profiles and update them, respectively. Over 53.3% also indicated that they share school-related information using SNS. Sharing of content is beneficial in many ways. According to Madden et al., Lenhart et al., and O'Keeffe and Clark-Pearson, it encourages collaboration and increased technical and visual literacy among young people.[lxiv]
- *Information seeking:* Twenty-eight percent of the youth in this study also use SNS to look for information about topics that interest them.
- *Business:* The findings also show that 20% of the respondents use social media to promote and transact business. Considering the background of the youth as students with their parents' occupation as mostly petty traders, it was not clear how they funded their online business transactions. Further research is needed to investigate the nature of businesses these youth are doing online.
- *Social integrative needs:* Katz et al. define social integrative needs as strengthening contact with friends, family, and relations.[lxv] The findings of this study reveal that use of SNS facilitates the satisfaction of the young people's need for friendship (68.6%) and for family attachments (46%).
- *Cognitive needs:* Cognitive needs are defined as the acquisition of information, knowledge, and understanding.[lxvi] Forty-eight percent of the youth indicated that use of SNS satisfies their need to discover and learn new things. Learning new technological skills were reported by 30% of the youth.

Although the respondents in the study were from poor backgrounds and disadvantaged neighborhoods, their uses and gratifications are consistent with young people from more affluent environments. For example, Lenhart and Madden, as well as Smith, report that most teens in the United States use these networks to stay in touch with people they already know, either friends whom they see a lot or friends whom they rarely see in person.[lxvii] Jones and Fox also found that young people ages 18–32 in the United States are likely to seek entertainment by watching online videos, playing online games, and downloading and listening to music.[lxviii]

The uses and gratifications for SNS use identified in the current study are also comparable to those of young people from other cultures. For example, a study involving students from Iran, South Africa, Malaysia, and the United Kingdom reported similar uses and gratifications for social media use. These included entertainment, interpersonal communication, information sharing, and social interaction with friends and family members.[lxix]

Sharing of information via social media, especially school-related information, is corroborated by several studies, including Baker, who reported that students use social media to discuss class-related subjects with their peers and teachers.[lxx] O'Keeffe and Clark-Pearson also found that Facebook and similar social media programs allow students to gather outside of class to collaborate and exchange ideas about assignments.[lxxi] A U.S. study to investigate question-asking-and-answering practices of high school students on popular SNS sites also reports that the majority of the questions (76%) were school related.[lxxii] It is gratifying to note that in spite of the poor backgrounds and living circumstances of the youth in this study, they were able to share and receive content of importance, including school-related information. Thus social media can play a vital role in school-related information.

Implications of the Findings for Library and Information Services

The findings reveal that most of the youth in the study accessed SNS at Internet cafés. This implies that they had limited or no Internet access in their schools or homes, requiring them to go to these cafés and pay to use the Internet. With regard to Internet access in public libraries, since 2012 the Ghana Investment for Electronic Communications (GIFEC), an agency of the Ministry of Communications, has provided all public libraries in the country with computers and Internet connectivity under the GIFEC Library Connectivity Project. The project includes the provision of ten mobile library vans equipped with computers and Internet connectivity for all the regional libraries in the country to provide access to books and ICT (information and communications technology) to schoolchildren, street youth, and graduates from the non-formal education division in underserved communities and remote areas in each region.[lxxiii]

It is probable that the youth in this study are not aware of Internet connectivity in the public libraries where they could access the Internet for free, hence the high patronage of the cafés. This has been confirmed in a 2013 country brief by Beyond Access, which indicates that the majority of the Ghanaian populace was not aware of services offered in public libraries.[lxxiv] Thus public libraries must do more to publicize their services in media and in schools so that young people, especially those from low-income families such as the youth in this study, will access the Internet for free to improve their ICT skills, media literacy, and support their healthy development in areas such as identity formation and social skills.

This study also reports on some negative encounters and cyberbullying in the participants' use of SNS, such as name-calling and offensive messages, as well as other negative effects of using SNS, such as sleep deprivation and lack of concentration at school. The public library can initiate a nationwide education of young people about the risks and dangers of using SNS and how to use them responsibly. They can collaborate with the Ministry of Education to organize seminars/workshops in schools, organize radio and TV talk shows on the subject, and produce handouts/flyers to be picked up in the libraries. Such a campaign will enable youth to enjoy the

benefits of using social media and educate them on how to avoid the risks associated with SNS use.

Conclusion

The findings of this study have shown that social media is popular among the study participants with over 70% having profiles on social networking sites, especially Facebook and WhatsApp. The patterns in social media use by young people in the study are largely consistent with those recorded in other studies in relation to popular social media sites, extent of use, purposes for use, mode of access, and problems encountered in using these sites, as well as the many benefits to their development, including self-identity, relationship development and maintenance, acquisition of social, communication, and technical skills, and new knowledge. Since accessing social media from Internet cafés is popular among young people, it is important for the government to formulate and implement policies that ensure that Ghanaian youth benefit maximally from its use but are well protected from the associated risks.

This study has provided significant data on the extent of use of social media, purposes for use, mode of access, and associated problems by youth from two suburbs of Accra, Nima and Maamobi. The main limitation is that the findings can be applied only to the 150 participants as a result of the use of non-probability sampling (convenience sampling) in their selection for the study. There is a need for more studies involving youth from other regions of the country and in different settings to confirm the findings.

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