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Engagement of Academic Libraries and Information Science Schools in Creating Curriculum for Sustainability: An Exploratory Study

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ABSTRACT

In 2010, the Association for the Advancement of Sustainability in Higher Education released, "Sustainability curriculum in higher education: A call to action," encouraging infusion of sustainability topics into universities' teaching and research. Since then, academic programs and research, related to social, economic, and environmental sustainability have enriched university curricula.   An exploratory study was conducted to determine the position and engagements of academic libraries and information science schools in their contributions to scholarly sustainability activities and curricular initiatives. This article presents the results of the study which reveals a number of engagements by library professionals in the areas of sustainability, such as increasing open access to research, building sustainability-related collections and research guides, and incorporating sustainability content into information literacy. While academic libraries and information science schools are engaged in a broad spectrum of initiatives that support their institutions' sustainability research and curricular functions, this study indicates that such activities require a more targeted approach.

Keywords: library sustainability, sustainability activities in academic libraries, marketing sustainability, LIS sustainability, LIS curriculum for sustainability, academic library engagement

Engagement of Academic Libraries and Information Science Schools in Creating Curriculum for Sustainability

INTRODUCTION

In 1990, over twenty-two international university presidents signed the Talloires Declaration in France, creating the Association of University Leaders for a Sustainable Future (ULSF). With their signatures, they committed their institutions to a ten-point action plan for incorporating sustainability and environmental literacy into research, teaching, outreach, and operations. More than 430 university presidents and chancellors at institutions in over 50 countries across five continents have now signed this Declaration that states: "universities bear profound responsibility to increase the awareness, knowledge, technologies, and tools to create an environmentally sustainable future" (Talloires Declaration, 1990). With the increasing recognition of higher education's critical role in creating a sustainable future, the Association for the Advancement of Sustainability in Higher Education (AASHE) was formed in 2006, as a professional association to coordinate and strengthen campus sustainability. Later that year, the American College and University Presidents' Climate Commitment (ACUPCC) was inaugurated and currently has 665 institutional signatories. Subsequently, university presidents and chancellors committed their institutions to incorporate environmental sustainability into their campus operations, services, research, teaching, and outreach (About AASHE, 2012). In 2010, AASHE initiated a self-reporting tool to assess and compare progress in campus sustainability efforts. The Sustainability Tracking, Assessment & Rating System™ (STARS) tool uses a credit system to report, rate, measure, and compare sustainability performance in higher education (STARS, A Program of AASHE, 2012).

These national and international efforts indicate that academic institutions are addressing the sustainability challenge in their operations, research, teaching, and services. To meet their commitments and goals, campus leaders are looking for input and leadership from all campus community stakeholders. It is therefore, incumbent on libraries and library information science (LIS) schools to respond to this challenge and be active partners in designing and supporting a sustainability curriculum. This is especially important since libraries support all disciplines and are in a unique position to serve as hubs for sustainability collaboration, dialog, and innovation.

An exploratory study was conducted to create a better understanding of academic libraries and LIS schools roles in educating for sustainability. For this purpose, a survey was conducted to measure their current levels of engagement. This article reports on the study's results and presents insights and opportunities for libraries and LIS schools to engage in the sustainability challenge on their campuses.

LITERATURE REVIEW: LIBRARIES CREATING CURRICULUM FOR SUSTAINABILITY

AASHE defines sustainability as "encompassing human and ecological health, social justice, secure livelihoods, and a better world for all generations" (About AASHE, 2012). In August 2010, AASHE challenged institutions of higher education by releasing a document, "Sustainability curriculum in higher education: A call to action" (2010), that encouraged the infusion of sustainability topics into their curricula and research. Currently, campus sustainability initiatives and academic programs are created and discussed by academic affairs' representatives, capital programs, general services, housing, student affairs, and university communications, as well as graduate and undergraduate students and faculty with expertise in responsible business practices, social justice, ecology, energy, public health, and the environment. How are academic libraries embracing campus-wide efforts to incorporate sustainability concepts into scholarship, teaching, and service? A search for articles, studies, and research on infusing sustainability across the curriculum indicated

that the topic is generally well represented in literature related to higher education, but very few results were discovered associated with library practices and LIS school participation in this emerging focus. Nevertheless, library literature related to greening libraries, environmental concerns, and sustainability concepts in academic libraries, as presented by Jankowska and Marcum, has been expanding since the 1990s (Jankowska & Marcum, 2010). The recent movement towards greening library buildings, collections, services, operations, and outreach has been well covered in a book titled, "Greening Libraries*,"* edited by Monika Antonelli and Mark McCullough (2012).

In 2000, Terry Links' article, "Transforming higher education through sustainability and environmental education," turned librarians' attention to the importance of using sustainability topics in information literacy. He encouraged libraries to "bring voices to the conversations by building of collections that challenge narrow disciplinary answers to the issues before us" (Link, 2000). The same year, the American Library Association's (ALA) President, Sarah Long, focused her term on the theme: "Libraries build communities" One of her initiatives was to support a special pre-conference workshop held at the July 2000 ALA Conference in Chicago with the goal to teach librarians community-building skills to promote sustainable development in their localities (Long, 2000). Since that time, few articles have been published on successful sustainability workshops (Jankowska, 2001) and recommendations of sustainability resources worth adding to library collections (DeSilva, 2012), (Applin, 2009). However, the attention was primarily focused on greening collections (Connell, 2010).

Recently, Megan Stark (2011) stated, "a cornerstone of academic librarianship, information literacy should be included in discussions about sustainability and academic libraries." In her article, she reported on the successful adaptation of the Association of College & Research Libraries (ACRL) information literacy competency standards encouraging students to reflect on cultural, historical, ecological, and economic elements of sustainability at the University of Montana Mansfield Library.

In 2010, Madeleine Charney (University of Massachusetts—Amherst) conducted a survey and interviewed librarians who were interested in academic library sustainability topics. She presented the preliminary results of this survey at the 2011 AASHE annual conference in Pittsburgh. Her presentation "Getting closer: The librarian, the curriculum and the office of sustainability" (2011), emphasized that "academic librarians play a vital role in supporting sustainability across the curriculum. As seasoned consolidators and distributors of information, librarians also bring a unique voice to sustainability councils and committees." Later, Charney published, "A sustainability librarian's manifesto: Your "Take Action" checklist," in which she presented practical ideas to move sustainability efforts forward. In this manifesto, she stated, "We must each do our part to prevent "the library" from becoming an afterthought in the sustainability movement. Step up, connect to the key players, ask questions. Be bold!**"**(2012).

From February to August 2012 Beth Filar Williams, Madeleine Charney, and Bonnie Smith organized a four-part webinar series titled, "Libraries for sustainability" (2012). The webinars connected librarians who were interested in sustainability and provided an opportunity for discussions about best practices, resource sharing, and future sustainability actions in libraries. The result of this networking series was the emergence of individuals committed to working within ALA to continue this important dialog in a more formal venue. Concurrently, a book chapter, "Libraries as sustainability advocates, educators, and entrepreneurs," by Beth Filar Williams, Anne Less, and Sarah Dorsey (2012b) presented interviews of librarians who implemented sustainability concepts into librarianship, although not necessarily in information literacy. The Sustainability Librarians LinkedIn group stemmed from the book chapter essays and has become a forum for "librarians who

are entrepreneurs, leaders, facilitators, and advocates in the sustainability movement" (http://www.linkedin.com/groups/Sustainability-Librarians-3928605). Increasingly, library literature has used the term sustainability in the context of LIS education (Howard, 2010), collection management (Chadwell, 2012), institutional repositories (Buehler, 2012), digital resources (Maron & Loy, 2011), scholarly communication (Schroeder, 2009), preservation, and digital formats (Hoebelheinrich, 2012).

In this study, the authors investigate sustainability through activities promoting equitable access to information that maximizes a return on investment for scholarly research, communication, and lifelong learning. They considered all academic library activities and LIS school initiatives in support of promoting equal access to information, open research and scholarship, and teaching across the curriculum in institutions of higher education. These activities and initiatives focus on supporting open access to information, research, and scholarly communication, promoting institutional repositories to preserve digital content, educating faculty about retaining their author rights, building sustainability-related collections and research guides, and incorporating sustainability content into information literacy, diversity, and teaching as well as collaborating on sustainability projects, and seeking funding for sustainability efforts.

PURPOSE OF THE STUDY AND RESEARCH QUESTIONS

As indicated in the literature review, more research needs to be conducted to fully understand and document academic library and LIS school contributions to their academy's sustainability curricular initiatives and activities. The main goal of the study was to investigate the engagement level of academic libraries and LIS schools in campus sustainability teaching and curricular activities. For academic libraries, the authors explored the following five research questions:

1. What is the level of academic library engagement in campus sustainability teaching and curricular activities?
2. Is there a relationship between the level of engagement of academic libraries in the emerging focus of teaching sustainability across the curriculum and the Carnegie Classification (CC) taxonomy of higher education institutions in the US?
3. What kind of sustainability activities are academic libraries involved in?
4. In what ways do academic libraries market sustainability resources to users?
5. In what areas do libraries collaborate on sustainability-related content with other units on campus?

Recently, AASHE's STARS Steering Committee discussed the need to connect STARS Ratings and CC (STARS Steering Committee Meeting, 2011 & 2013). This discussion relates directly to the authors' second research question where they investigated the association between the CC of institutions and their level of engagement in activities that support sustainability curricula.

While academic libraries were the main focus of this study, the authors were also interested in exploring the practices of LIS schools. They wanted to understand whether and in what ways LIS curricula have evolved to prepare students for their future academic library workforce demands in relationship to existing courses that encompass a context of sustainability. The authors proposed one research question:

1. What is the main focus of sustainability stressed by LIS schools in their curriculum and practice?

Engagement of Academic Libraries and Information Science Schools in Creating Curriculum for Sustainability

A research survey design with an online questionnaire was used to elicit responses from academic librarians, administrators, and LIS educators and students to explore answers to the above six research questions.

RESEARCH DESIGN AND METHODOLOGY

An online survey was used as the primary research method, as well as library, LIS program, and university homepage searches and a literature review. To efficiently collect data describing the research phenomenon the questionnaire was designed to collect qualitative information for the purpose of further understanding academic libraries' and LIS schools' sustainability initiatives and activities in North America (see Appendix 1). The Qualtrics online survey software was used to create the survey with both open-ended and closed questions, allowing respondents to make comments. The survey questionnaire consisted of 34 questions. This survey used Branching Logic which allowed targeting two different groups by jumping a block of questions if it did not pertain to the specific group (LIS or Academic Library). Three of these questions were general questions to establish the affiliation of the respondent, either with an academic library, LIS program, or both. Twenty-four questions were addressed only to respondents from academic libraries and 7 questions addressed only to LIS school participants. Eighteen questions focused on sustainability initiatives and activities in academic libraries, including instruction, research, scholarly communication, resources, collaboration, and outreach. Six questions addressed the university's commitment to sustainability as expressed by the establishment of an office of sustainability, committees, policies, and sustainability workshops. Seven questions pertained specifically to LIS schools and their sustainability initiatives.

Prior to distribution, the questionnaire was reviewed by a number of colleagues and approved by the Internal Review Board (IRB) offices of the authors' institutions. The information about the survey and link to questionnaire, with its accompanying introduction, was then distributed using 7 electronic mailing lists, 6 LinkedIn groups, 7 blogs, 2 Google groups, multiple Facebook accounts, and over 200 direct solicitations. Two weeks after the initial survey distribution, the authors sent reminders through the various posting mechanisms (electronic mailing lists, blogs, LinkedIn) to encourage additional survey participation. The survey was open for three weeks, from April 20th through May 2nd, 2012.

STUDY POPULATION AND RESPONSE RATE

The survey targeted two categories of respondents. Academic library employees (librarians, administrators, managers, and staff) in higher education institutions were in the first category. Faculty, staff (non-faculty), students, administrators, and managers from LIS schools comprised the second category. Geographically, the survey targeted employees and LIS school students in North American institutions. Non-US institutions were removed from the data analysis as a result of the low response rate. Survey respondents included 247 academic library employees and LIS school employees and students. Twelve (five from Canada) respondents from institutions outside the US were removed from the data analysis. A total of 203 respondents reported working in an academic library, while 58 respondents reported being associated with an LIS school. Sixteen respondents were associated with both an academic library and an LIS program (Figure 1).
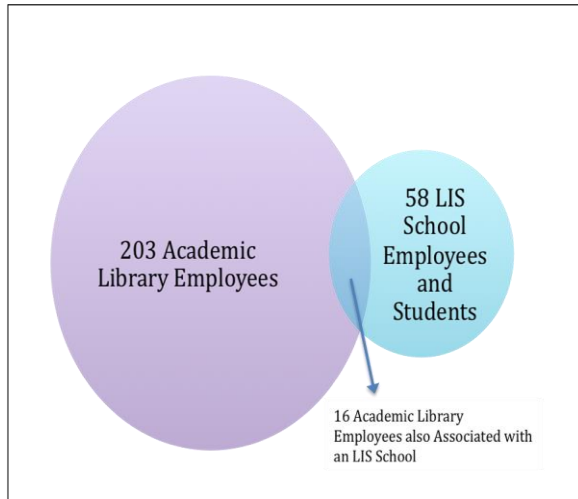
Fig. 1 Number of respondents by category

ACADEMIC LIBRARIES

Among academic library respondents, 62% were librarians, 22% staff (non-librarian), 18% administrators, and 10% managers. Twelve percent of respondents selected more than one type of position (librarian and administrator, for example). Respondents in the academic library category represented 149 institutions, constituting approximately 6.3% of the total number of libraries in four-year degree-granting US institutions.[3] Of the 149 institutions in the sample, 58 represented CC category one, 44 category two, 24 category three, and 23 category four (Figure 2). Public institutions accounted for 56% and private institutions constituted 44% of the total number.

The institutions' size listed by the number of students was represented with 64% under 15,000 students and 36% with 15,000 or more students (Figure 3). The geographical region most represented was the South (41%), followed by the Midwest region (22%). The West and the Northeast were similarly represented with 16% and 18% respectively.[4]

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[3] Calculations based on *Academic Libraries*: 2010. (2012). The National Center for Academic Statistics. Retrieved February 9, 2013 http://nces.ed.gov/pubs2012/2012365.pdf.

[4] The geographical areas were defined as regions: South, Midwest, West, and Northeast following U.S. Census Bureau. Census Regions and Divisions of the United States. Retrieved February 9, 2013. https://www.census.gov/geo/reference/gtc/gtc_census_divreg.html.
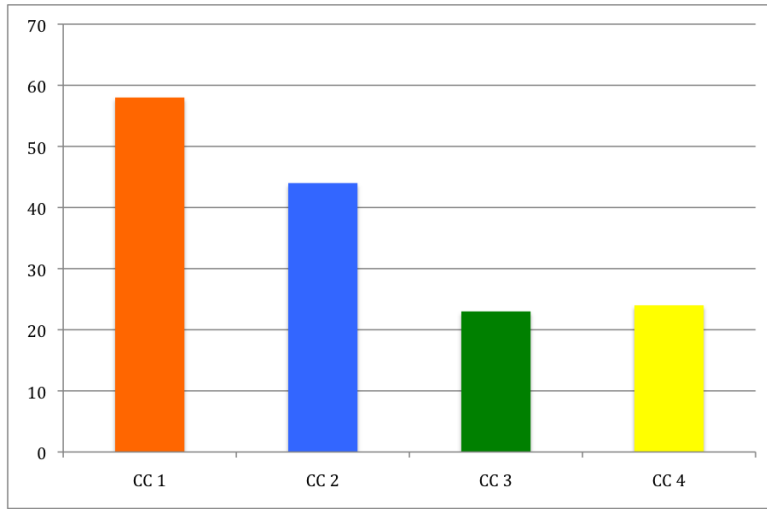
Fig. 2 Number of Institutions by Carnegie Classification
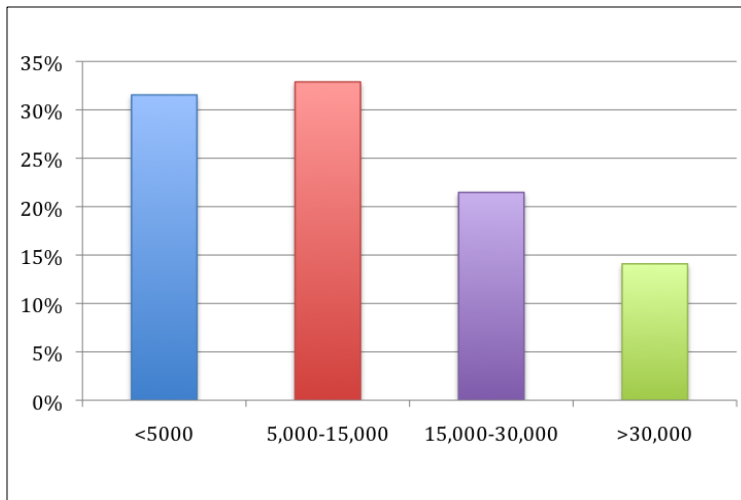
Fig. 3 Percent of Institutions Represented by Number of Students

LIS SCHOOLS

The second survey category targeted faculty, staff, and students from LIS schools in the US and Canada. Considering Canada's low response rate, the authors excluded their responses from the analysis. The sample in this category included 40 students and 17 faculty members from 23 LIS schools, constituting 37% of the total number of ALA accredited programs.[5]

QUANTITATIVE ANALYSIS RESULTS

To evaluate participants' perceptions of their academic libraries' engagement in teaching for sustainability across the curriculum (addressed by the first and second research questions), the authors

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[5] Calculation based on ALA Accredited master's programs (2013). Retrieved February 9, 2013. www.ala.org/accreditedprograms/home.

created a scaling system that measures the outcome of five categories based on responses to the following survey questions.

CATEGORY 1: FORMAL DOCUMENTS/STATEMENTS/ACTIONS/PROGRAMS

The first category included the following questions:
Q. 4—Has your library adopted any of the following (sustainability statement, commitment, action plan, or other)? Please select all that apply.
Q. 18—Is an individual or group responsible for coordinating your library's sustainability efforts?
Q. 19—Select the sustainability efforts (institutional repository, data curation, collection development, subject research guide, research instructions, exhibits, other) this individual or group coordinates. Please select all that apply.
Q. 21—Are your library's sustainability efforts reported to any of the following (University/college administration, Library administration, University level committee, Library level committee, State level, AASHE Sustainability Tracking & Reporting System (STARS®) report, None of the above, Unsure, N/A (We have no sustainability efforts.), Other—please elaborate)? Please select all that apply.

CATEGORY 2: INCORPORTATING SUSTAINABILITY COMPONENTS INTO INFORMATION LITERACY

The second category includes the following question:
Q. 5—What sustainability content areas are librarians at your institution incorporating into student information literacy classes/instruction (Open access to research, Retaining author rights, Institutional repository use, Public engagement in the community, Environmental, Social equity, None, Unsure, Other—Please elaborate)? Please select all that apply.

CATEGORY 3: LIBRARIES SUSTAINABILITY ACTIVITIES

The third category included the following questions:
Q. 6–In which of the following areas is your library involved (Sustainability research, Sustainability teaching, Sustainability curriculum development, Sustainability collection development, AASHE Sustainability Tracking & Reporting System (STARS®) report, Greening libraries, None, Unsure, Other–please elaborate)? Please select all that apply.

Q. 7–Does your library have a designated person responsible for coordinating sustainability collection development with other subject specialists (Yes, No, Unsure, Other—please elaborate)?

Q. 12–Does your library have an institutional repository (Yes, No, Unsure)?

CATEGORY 4: MARKETING SUSTAINABILITY RESOURCES AND PRACTICES

The fourth category includes the following questions:
Q. 9–In what specific ways does your library market sustainability resources to users (Subject research guides, Exhibits, Instruction, Social media, Newsletter, Library website, We do not market sustainability resources, Unsure, Other)? Please select all that apply.

CATEGORY 5: COLLABORATING WITH OTHER UNITS ON CAMPUS

The fifth category includes the following questions:
Q. 14–In which of the following areas has your library collaborated on sustainability-related content with other units on campus (Teaching/co-teaching, Training, Co-authoring, Course development, Curriculum development, Conference or symposium, Presentations, Workshops, Exhibits, Speakers, Films, AASHE Sustainability Tracking & Reporting System (STARS) report, Other collaborative activities, None of the above, Unsure? Please select all that apply.

Q. 16–Has your library sought development or grant funding for sustainability efforts (Yes, No, Unsure)?
Q. 26–Is your library represented on any of the committees responsible for developing and recommending policies and strategies to advance the university's/college's commitment to sustainability (Yes, No, Unsure)?

The questions above included 63 possible initiatives or activities as options for engagement in sustainability efforts. *Category 1* (Formal documents/statements/actions/programs) included 20 options; *Category 2* (Incorporating sustainability components into instruction) included 6 options; *Category 3* (Libraries sustainability activities) included 9 options; *Category 4* (Marketing sustainability resources and practices) included 7 options; and *Category 5* (Collaborating with other units on campus) included 21 options. Each of these options was assigned one point. The total points for each institution were then tabulated based on question answers in the five categories above. Where several individuals from the same institution completed the survey, the highest number of points for each category was attributed to the institution. Where the institution was unknown, the data was removed from the dataset.

The libraries represented in the survey were grouped into four intervals according to the number of points received, one point for each activity the respondent acknowledged their library was involved in. The intervals were selected to represent a low (minimally engaged) and a high (highly engaged) level of engagement, with most institutions falling in two middle intervals representing 6 to 40 distinct activities. The selection of the interval cutoffs were based on the response bell curve and what the authors thought represented a fair assessment of the level of engagement. The four engagement intervals were:

   Minimally engaged: libraries with 0 to 5 points,
   **Somewhat engaged:** libraries with 6 to 20 points,
   Moderately engaged: libraries with 21 to 40 points,
   Highly engaged: libraries with 41 to 63 points.

Survey results revealed that out of 149 libraries represented in the survey, 39 (26%) were minimally engaged, 73 (49%) were somewhat engaged in sustainability activities, 33 (22%) were moderately engaged,

and 4 (3%) were highly engaged (Figure 4). This quantitative data showed that almost 75% of academic libraries represented in this survey were involved in sustainability initiatives or activities.
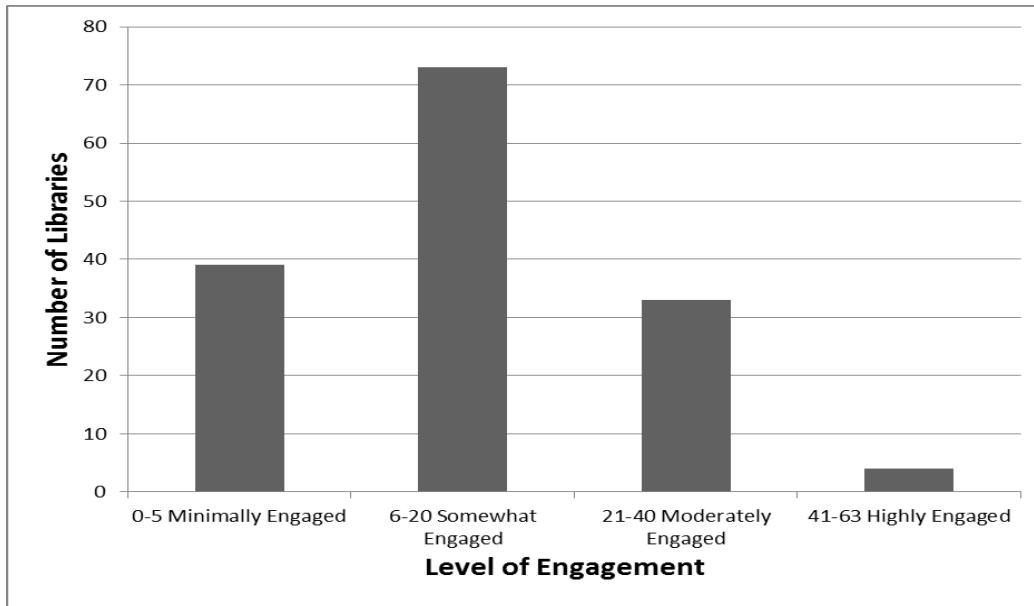
Fig. 4 Level of library engagement in sustainability activities

Next, the authors measured the strength of association between the universities' degree level, volume and field coverage, research funding, undergraduate selectivity, and specialization (expressed by the Carnegie Classification (CC) taxonomy) and the level of sustainability activities (expressed by an index of library engagement in activities supporting sustainability). The first CC is assigned to doctoral-granting institutions, the second to comprehensive universities and colleges, the third to liberal arts colleges, and the fourth to two-year colleges and institutes (McCormick & Zhao, 2005).

The authors constructed the index by adding the responses to five categories of questions about the libraries engagement (categories 1-5). The index (Fig. 5) was represented on the ordinal scale ranging from 1 to 4, where the value of 1 represents the highest level of engagement (the number of initiatives and activities ranging from 41 to 63) and the value of 4 represents the lowest level of engagement (ranging from 0 to 5). The strength of the association was calculated with Spearman's rank-order correlation (Laerd Statistics, 2013) using SPPS statistical software. The Spearman's rho correlation between CC and the index is 0.118 (Fig. 6). This is a weak positive correlation, but statistically insignificant (Sg. 2-tailed = 0.153). This correlation analysis helped the authors to answer the second research question, and found that the CC taxonomy of higher education institutions in the US is associated with the level of academic libraries' engagement in teaching sustainability across the curriculum, but both variables do not influence each other.

Total Engagement	Index	CC
59	1	1
52	1	1
41	1	1
41	1	2
40	2	1
39	2	3
35	2	2
33	2	1
30	2	1
29	2	1
29	2	1
29	2	2
28	2	1
28	2	2
28	2	4
28	2	4
27	2	1
27	2	3
27	2	4
26	2	3
25	2	2
24	2	2
24	2	4
23	2	1
23	2	1
23	2	2
23	2	3
22	2	1
22	2	1
22	2	1
22	2	2
22	2	2
21	2	1
21	2	1

21	2	1
21	2	3
21	2	4
20	3	1
20	3	1
20	3	2
20	3	3
19	3	1
19	3	2
18	3	1
18	3	2
18	3	4
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0	4	2
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0	4	4
0	4	4

Fig. 5 Index of library engagement in activities supporting sustainability and the Carnegie Classification taxonomy.

			Index	CC
Spearman's rho	Index	Correlation Coefficient	1.000	.118
		Sig. (2-tailed)	.	.153
		N	149	149
	CC	Correlation Coefficient	.118	1.000
		Sig. (2-tailed)	.153	.
		N	149	149

Fig. 6 Correlation between the index of library engagement in activities supporting sustainability and the Carnegie Classification taxonomy.

In summary, this survey revealed that the level of engagement of academic libraries in sustainability activities is associated with the CC taxonomy of US colleges and universities but that they do not influence each other. For example, libraries in institutions with Carnegie Classification categories one and two do not necessary function at a higher level of engagement in their sustainability activities and initiatives than libraries at institutions classified as categories three and four. Additionally, quantitative data showed that nearly 75% of libraries represented in the survey were engaged in sustainability initiatives and activities.

QUALITATIVE ANALYSIS: SURVEY RESULTS AND RESPONDENT COMMENTS

ACADEMIC LIBRARIES

When asked about how engaged respondents felt academic libraries should be in campus sustainability teaching and curricular activities, 47% believed libraries should be very engaged, while 48% felt libraries should be somewhat engaged. Only 5% selected the option, "Not very engaged–this is not a priority." This question received the most comments with 50% of the respondents providing an explanation with their answers. Regardless of the choice made (very engaged, somewhat engaged, or not a priority), almost a third of the respondents commented that sustainability is only one area of the curriculum that needs to be supported. Eight percent of those who provided comments felt strongly that academic libraries should play a significant role in sustainability teaching and curricular activities with comments such as:

"Libraries are the hub of campus life and ought to take the lead in sustainability issues; We are positioned perfectly to be an integral player to sit at the table along with other faculty and administrators deciding campus-wide sustainability initiatives, programs, and philosophies."[6]

The results of the survey reveal academic libraries are engaged in a wide variety of activities that both support and enhance sustainability curricular efforts at their institutions. Since sustainability links many disciplines, it was not surprising to find that these important library services were prominent.

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[6] Original comments. All comments are anonymous.

A quarter of respondents indicated that their library was involved in sustainability research while 17% of respondents indicated their library was involved in teaching sustainability topics. More than 35% of respondents included initiatives related to greening libraries such as:

"We do have some modest energy and resource programs in place, paper reduction, electricity consumption reduction, compost bins in the library, etc.; All I know, is we are recycling our paper and we push for green cleaning; We participate in environmental efforts such as recycling, reducing paper waste, green printing, using filtered tap water, composting in library kitchen; I think the Library should be as sustainable as possible –adopting measures to mitigate the impact we have on the environment; probably minimal efforts with greening the library–could do more."

Open access (OA), retaining author rights, and institutional repositories (IRs) appeared prominently and in diverse contexts throughout the survey. These were seen as sustainable and equitable models of access to information that also maximizes the return on investment for scholarly research. These topics were incorporated into student information literacy programs, used in development and grant proposals, and reported as creating opportunities for collaboration. One respondent commented, "I believe we should teach students the value of access to information in open access formats and the value of archiving and licensing their own work for use and re-use by others."

Nearly 60% of respondents indicated that their library has used an IR specifically to collect, preserve, and disseminate sustainability-related scholarly materials. Reportedly, the items most often archived in the IR for this purpose were articles and reports (56% of those who have an IR), and graduate and undergraduate work (50% of those who have an IR). Others reported having a dedicated IR section for sustainability related content and using the repository to archive materials from the university's office of sustainability.

Another significant area of engagement was incorporating sustainability content into information literacy, including topics related to OA (55%), use of the IR (36%), environmental subjects (33%), retaining author rights (30%), social equity (27%), and community engagement (26%). In several instances, respondents reported that inclusion was not programmatic but rather an individual decision. One respondent captured this focus: "We have a supportive role in helping to infuse sustainability literacy and practice on Campus."

Information literacy was also reported as one of the key ways in which libraries market sustainability resources with the most common method being the use of subject research guides. Exhibits, the library's website, and social media were also used by libraries to showcase and promote their sustainability materials and resources. Academic libraries are accustomed to collaborating with other units on campus. With regards to sustainability-related content, teaching and presentations were reported as the most common methods in which libraries work together with other units on campus while more than a third of the respondents reported collaborating on exhibits, speakers, workshops, and films.

The least common areas of collaboration was the co-authoring of research and working jointly on the AASHE STARS' report. The survey responses revealed a low rate of library engagement in the STARS reporting process, indicating that academic libraries are either not involved at all or at a minimal level. In the current version of STARS 1.2, (STARS, A Program of AASHE, 2012) libraries are evaluated under the topic of support for research category and waste generation in paper and ink during printing. Of the 70 possible STARS credits, libraries could be evaluated on their sustainability engagement activities. Through broader evaluation in

STARS, libraries would demonstrate to campus, administrators, and faculty that they have much to offer to academic sustainability. During the STARS period of public commenting (November 2012) on AASHE'S recently drafted credits, a number of library professionals submitted remarks addressing this issue. They petitioned the STARS 2.0 committee to: evaluate academic library initiatives supporting OA; promote IRs to preserve digital content created by faculty, graduate, and undergraduate students; educate faculty about retaining their author rights; build sustainability-related collections and research guides; incorporate sustainability content into information literacy, diversity and teaching; and collaborate on sustainability projects. If approved, these activities and initiatives might have a chance to engage library partnerships with other university stakeholders and foster a greater level of collaborative sustainability in higher education.

When asked about library-specific documents related to a sustainability vision, 32% of respondents indicated that they had a detailed sustainability statement, commitment, or action plan. Over 52% of respondents indicated that there is no official reporting on sustainability efforts at the university or library level while only 15% stated having a person responsible for coordinating sustainability collection development. Twenty nine percent reported having a person responsible for coordinating their library's sustainability efforts, with only 17% functioning in an official capacity. In the words of a few respondents:

> "We do have some sustainability actions but no formal plan; There are multiple teams responsible for several of the options. No one team or committee is responsible for all aspects; Individual librarians do many of the listed things; These duties are spread out between various groups."

In summary, although the majority reported the lack of a library-specific formal sustainability commitment or action plan, more than 95% of respondents from academic libraries felt that libraries should be very engaged or somewhat engaged in educating for sustainability. Many replied indicating they have some sustainability actions, but no formal plans. Only 17% of respondents reported having a person functioning in an official capacity and responsible for coordinating their library's sustainability efforts. The survey results also revealed that library employees still strongly associate the term sustainability with green efforts. Recycling programs, tracking energy usage, making appropriate changes to reduce energy consumption, LEED certified buildings, and greening libraries were often mentioned.

LIS SCHOOLS

When LIS school participants were asked the question, "How proactive do you think library schools should be in preparing students for sustainability practice in libraries?" Twenty-five respondents stated, "very proactive," 26 replied "proactive," 5 felt "neutral," and 2 stated, "not an LIS school role" (Figure. 7).
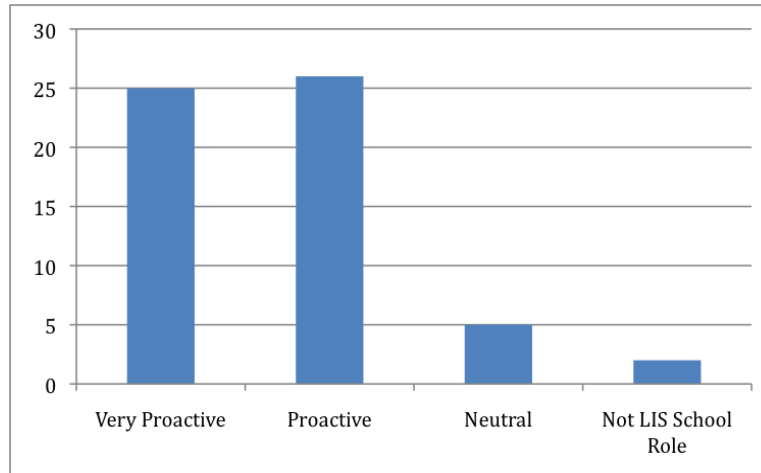
Fig. 7 "How proactive do you think library schools should be in preparing students for sustainability practice in libraries?"

These results portrayed that 88% of respondents felt sustainability issues should be addressed in LIS programs. Survey respondents' quotes provided insights on what they believed to be a priority and their experiences in attending or working in LIS schools:

"Same reasons I believe libraries should consider it a priority. Moreover, the training starts in library school, so it is imperative that sustainability practices are taught in these programs;
It should be learned in library school and continued as librarians branch out in their various disciplines within the field."

The authors were interested in specific ways that LIS schools have evolved to reflect academic institutions' foci on educating for sustainability. The survey respondents were asked to list course names offered in LIS programs that incorporate sustainability-related subject matter. The most popular were:
- course content addressing diversity issues–39 respondents,
- OA and scholarly communication: IR, retaining author rights, data curation or digital content–35,
- patrons' social equity issues–31,
- sustainability in collection development–15,
- greening library buildings and practices–15.

Aspects of scholarly communication, collection development, and social equity/diversity were considered major library concerns for information access. Survey quotes focused on specific content in LIS programs that went beyond traditional library courses such as: Diversity and Global Connections; Literacy and Services to Underserved Populations, Organizational Ethics, Intellectual Freedom; Information Ecology and Ecological Informatics; Ethics Diversity and Change; Information Ethics and Policy; Multicultural Services in Libraries; Information Services to Diverse Client Groups; Archival Outreach: Programs and Services; Library Architecture and Space Planning; Information Access & Knowledge Acquisition; Community Informatics; and Accessibility for Information Technology.

When asked how they felt regarding how LIS programs have evolved to reflect academic institutions' focus on educating for sustainability, some faculty stated:

"Expansion of the meaning of information resources. Stewardship and continuity (sustainability) of information resources emphasized. More discussion of systems and users as unique human patterns;" "Providing classes to educate students on diverse, collection development, open access, intellectual freedom;" "emphasizes importance of open access–library is open to public. Diversity and social equity are important, as is sustainability in the buildings and in classes."

Among LIS students, answers to this question were very diverse. Some of them reported a strong emphasis on sustainability:

"My LIS program put strong emphasis on diversity and the value of multiple perspectives in problem solving. The program encouraged students to go beyond our traditional thoughts about libraries to discover new solutions that promote sustainability; I am enrolled in the Information and Diverse Populations specialty in my MLS program, which is designed to educate students on the need to provide services inclusive of a variety of users."

Other students reported an absence of focus on sustainability such as:

"To my knowledge it is not even on the radar, let alone a priority. I've never heard such ideas mentioned in courses, guest talks, and research areas. The campus/university in general is, in my opinion, extremely out of touch with sustainable living habits that I considered standard before arriving here. Oblivious waste and consumption are the norm here, as they are, throughout much of the Midwest, from what I can see; I don't recall coming across the concept of sustainability in my classes."

The authors were interested in discovering if LIS programs marketed their sustainability efforts and course offerings to attract students and in what specific areas. Of the 58 responses to this question, only 5 answered 'yes," 20 responded "no," 23 were unsure, and 10 chose "not applicable." Specific areas of sustainability that some schools advertised encompassed diversity in multiple iterations, such as global connections, populations, and partnerships with community agencies, an archives management, digital libraries, and developing collections of open access databases for small-budget libraries. Additional LIS program sustainability marketing included education advantages, such as originality in course offerings, technical skills, and well-qualified staff or a scholarship program such as:

"The Information and Diverse Populations specialty is actually a scholarship program that covers all tuition for full-time students enrolled in the MLS program. In addition we are assigned mentors and receive monthly lectures from individuals in the field on various issues of diversity."

In summary, the LIS schools' section of the survey elicited responses illustrated an innovative range of coursework that addresses sustainability in digital content, importance of OA, patrons' free access to information, social equity and diversity, transformations in collection management, intellectual freedom, continuity and expansion of information resources. LIS respondents (88%) believed that LIS schools should play a role in educating for sustainability. A 10% response rate to marketing LIS program sustainability efforts

and course offerings to attract students was considered low by the authors in contrast to actual activity recorded by survey respondents. The notion of LIS schools marketing sustainability components in their programs does not equate to what is actually occurring within the curriculum and reported in the survey by LIS faculty and students.

FINDINGS AND DISCUSSION

This exploratory study provided an empirical snapshot of library employee and LIS faculty and student perceptions on the level of engagement of academic libraries and LIS programs in the emerging focus on educating and teaching for sustainability across the curriculum in US academic institutions. The authors considered the research successful from the perspective of establishing some baseline information for continuing to improve our understanding of the role of libraries and the LIS schools in educating for sustainability.

Findings related to the first research question addressing the level of academic libraries' engagement in campus sustainability teaching and curricular activities revealed that out of 149 libraries represented in the survey, 26% were minimally engaged, 49% were somewhat engaged, 22% were moderately engaged, and 3% were highly engaged in sustainability activities and initiatives.

Conclusions related to the second research question revealed a weak positive correlation between the level of engagement of academic libraries in the emerging focus of teaching sustainability across the curriculum and the Carnegie Classification taxonomy of higher education institution in the US.

Findings related to the third research question addressing types of sustainability activities at academic libraries revealed over 74% of the libraries represented in this research reported between 6 and 40 actions and initiatives. Some of the reported sustainability related activities included:

- information literacy classes incorporating topics related to open access, use of the IR, environment, retaining author rights, social equity, and community engagement (71%)
- collaborating with other units on campus sustainability-related activities (62%)
- creation of subject guides (46%)
- efforts to build collections devoted to sustainability-related topics (40%)
- greening libraries (35%)
- involvement in sustainability research (23%)
- teaching (17%)
- involvement in STARS report (5%)

Findings related to the fourth research question revealed the following most frequently reported venues for marketing sustainability resources to users:

- subject research guides (46%)
- information literacy classes (34%)
- exhibits (32%)
- library website (29%)
- social media (22%)

Responses to the fifth research question addressing the area of library collaboration on sustainability-related content with other units on campus indicated that libraries collaborate most often with academic units and less frequently with administrative or other non-academic campus units. The findings presented the following most frequently reported sustainability-related activities and initiatives:

- teaching with academic units on campus (32%)
- presentations with academic units on campus (24%)
- exhibits with academic units on campus (20%)
- course development with academic units on campus (18%)
- organizing speakers with academic units on campus (18%)

Findings related to one research question addressing the focus of sustainability stressed in LIS curriculum and practice revealed the following most frequently reported sustainability-related course content:

- diversity: organizational ethics, services to diverse user groups (67%)
- OA and scholarly communication: curation of digital content and intellectual freedom (58%)
- social equity: free access to information, accessibility for information technology (54%)
- collection development: continuity and expansion of information resources (25%)
- greening: library buildings, collections, services, and information technology (25%)

In summary, both categories of respondents expressed an overwhelming support for engaging academic libraries (95%) in campus sustainability teaching, research, and outreach, and LIS programs (88%) in their curricular activities.

CONCLUSION

Overall, the authors found with the increasing focus on educating for sustainability, library employees, LIS faculty, and students realize the importance for libraries and LIS programs to respond to this expanding movement. Importance of OA, IRs, retaining author rights, and diversity figured prominently in different contexts throughout the survey. These are seen as sustainable and equitable models of access to information that also maximize a return on investment for scholarly research and protect equal access to resources, now and in the future. They are incorporated into student information literacy programs, research guides, collection development, teaching equity and diversity issues; used in development and grant proposals; and reported as creating opportunities for outreach and collaboration.

The study demonstrated libraries in institutions with Carnegie Classification categories one and two do not present a higher level of engagement in their sustainability activities and initiatives than libraries at institutions classified as category three and four. While most academic libraries represented in the study have been engaged in a broad spectrum of activities that support their institution's sustainability research and curricular functions, this study has indicated that these activities lack a focused and targeted approach. The study revealed a gap between an eagerness to be actively engaged in sustainability activities and an absence of specific sustainability documents such as a statement, commitment or action plan in the strategic plans of academic libraries. Out of 149 libraries represented in the study, only a few were reported as having sustainability activities included in their strategic plan. Expending evaluation criteria for academic libraries in

the STARS reporting system might lead to the development of action plans focused on sustainability activities and allow them to respond more quickly to the needs of university sustainability initiatives.

LIS programs may not be marketing courses that focus on sustainability, but according to survey responses, they do offer a variety of substantive courses that include aspects of sustainability-related content, focusing on access to information and diverse users; transformation in collection development and management; entrepreneurship in information, ethics, diversity and change; multicultural services; community informatics; accessibility for information technology; archival outreach; digital curation; digital scholarship and open content.

This exploratory study initiated a better understanding of the role of libraries and LIS programs in educating for sustainability and presented opportunities for further research to discover essential factors to foster sustainability and effective ways to market sustainability concepts in LIS programs.

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APPENDIX 1. SUPPLEMENTARY DATA

Supplementary data to this article can be found online at:
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