

Institutional Repositories: The Experience of Master's and Baccalaureate Institutions

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Abstract

In 2006, MIRACLE Project investigators censused library directors at all U.S. academic institutions about their activities planning, pilot testing, and implementing the institutional repositories on their campuses. Out of 446 respondents, 289 (64.8 percent) were from master's and baccalaureate institutions (M&BIs) where few operational institutional repositories (IRs) were in place but where interest in learning more about the M&BI experience pertaining to IRs was high. Comments by these library directors in the MIRACLE study demonstrated their desire to learn more about IR planning and implementation at institutions like their own. We address their comments in this paper, which compares IR activities in M&BIs to research universities (RUs).

Background and Objectives

The proliferation of digital forms of the scholarly record raises serious and pressing issues about how to organize, access, and preserve the record in perpetuity. Furthermore, teaching materials, institutional records, and special collections are increasingly delivered in digital form. The response of academic institutions has been to build and deploy institutional repositories (IRs) to manage the digital scholarship their learning communities produce and utilize in research and teaching.

To discover the experiences that academic institutions have and the challenges they face during IR planning and implementation, researchers have surveyed research

universities—the academic institutions most likely to have an operational IR or an IR implementation project underway.¹ Expanding their survey to include liberal arts colleges, Clifford Lynch and Joan Lippincott report that only 6 percent of liberal arts colleges have an operational IR. They conclude that "deployment of institutional repositories beyond the doctoral research institutions in the United States is extremely limited."²

In search of IR models, best practices, and success factors, MIRACLE (Making Institutional Repositories A Collaborative Learning Environment) Project investigators enlisted a different strategy. We conducted a census of library directors at all U.S. academic institutions to learn about their involvement with IRs, deliberately casting a wide net, knowing we would recruit institutions that had not yet jumped on the IR bandwagon.³ Academic library directors and senior library administrators at master's and baccalaureate institutions (M&BIs) who participated in the MIRACLE study revealed a strong desire to learn more about the IR planning and implementation experience from institutions like their own.

The purpose of this paper is to describe the IR planning, pilot testing, and implementation experience of master's and baccalaureate institutions (M&BIs) and make comparisons to research institutions (RUs) where most IR efforts have been undertaken to date.⁴

Literature Review

Several surveys of librarians at North American higher education institutions have been conducted in order to gain a better picture of the overall state of IR development;

however, the vast majority of these surveys have focused on large research universities (see, for example, Kathleen Shearer, 2004; Shearer, 2006; and Charles Bailey et al., 2006).⁵ Whereas Shearer focuses on members of the Canadian Association of Research Libraries (CARL), Bailey focuses on members of the Association of Research Libraries (ARL). Many members of both of these organizations are libraries at large comprehensive research universities and other large research organizations.⁶

A few authors have conducted similar surveys that were more inclusive. For example, Lynch and Lippincott surveyed CNI (Coalition for Networked Information) member institutions, taking care to target liberal arts colleges that were consortial members of CNI. However, their resulting respondent pool was quite top-heavy with a large percentage of doctoral universities (73 percent).⁷ Similarly, Mark Ware and Mark Ware Consulting looked at IRs indexed by OAIster, IRs built on the EPrints platform, and a hand-picked selection of 45 IRs that were mostly large research universities (for example, Florida State University, Georgia Tech, MIT, Ohio State, University of Virginia, and Virginia Tech).⁸

A recent, more broadly based survey from Ithaka confirms one of the central findings from the MIRACLE study—that the large research universities are advanced in the development of their IRs but are not representative of the majority of U.S. colleges and universities. Ithaka states that, although "digital repositories are far more common at the research universities than they are elsewhere, ...there is nearly uniform interest in these repositories across the spectrum of libraries surveyed." Ithaka goes on to point out specific differences between research universities and small colleges in terms of both the

types of content they are storing in their IRs and the objectives these types of institutions have for their IRs.⁹

Just as there is a dearth of IR-related survey data for the small colleges, so, too, is there a dearth of case studies covering IRs at these institutions. To generate questions for survey instruments, MIRACLE Project investigators compiled an extensive bibliography of IR-related literature (see <http://miracle.si.umich.edu/bibliography.html>) and identified 47 case studies of U.S. institutional repositories, 44 of which cover IRs at research universities where high levels of research were being done. The three remaining case studies examine IRs at master's colleges and universities (M&BIs).¹⁰ Only Marianne Buehler and Adwoa Boateng discuss an M&BI going it alone; the other two articles concern IRs run by consortia. Details about these three cases conclude this literature review.

Christopher Nolan and Jane Costanza of Trinity University's Coates Library write about their IR consortium, the Liberal Arts Scholarly Repository. Their article details the original impetus for their IR, as well as their reasoning behind their selection of both the Digital Commons and the CONTENTdm platforms. It includes a list of important practice and policy decisions that they suggest library staff consider early on in the IR development process. The authors also delineate the technical features of the Digital Commons software and discuss the advantages of participating in a consortium and the steps that they have taken in order to market the IR to both faculty and students. In conclusion, they mention types of usage statistics that Digital Commons calculates, speculate as to the potential impacts that the IR may have, and mention their future plans for adding a broader range of content to the IR.¹¹

John-Bauer Graham, Bethany Skaggs, and Kimberly Stevens introduce their IR consortium, the Cornerstone Project. This is a state-wide digital repository project run by the Network of Alabama Academic Libraries (NAAL). Graham, Skaggs, and Stevens trace the development of the Cornerstone Project as well as the involvement of Jacksonville State University's (JSU) Houston Cole Library in this project. They discuss JSU's selection criteria for digitization of content, JSU's marketing efforts on behalf of the repository, and the accessibility and permanence of JSU's repository content. Additionally, they describe how the library's involvement in the Cornerstone Project resulted in a new and improved relationship with the Archaeology Department of the university. In conclusion, the authors offer some advice to other libraries seeking to get involved in similar digital repository projects.¹²

Buehler and Boateng describe the impact of establishing and operating an IR on the roles and careers of reference librarians. After providing some general background about the impetuses for libraries to create IRs, the shifting roles of librarians, and the crucial necessity to market the IR, the authors detail the experiences of Wallace Library at the Rochester Institute of Technology (RIT). They briefly describe the composition, goals, and activities of the IR task force that was convened at RIT. Some of the activities described include an early needs assessment, design and development of the IR interface, and demonstration and marketing of the IR. In conclusion, the authors point out that reference librarians have to take on a new role as change agents in order to get faculty to use and contribute to the IR.¹³

Although these three case studies help to illuminate the IR-related experiences of small teaching and learning colleges and universities, many more of these types of case

studies are needed to get a less idiosyncratic and more well-rounded picture of IR activity at these institutions. In the sections that follow, we present methods and results focusing on the experiences of these institutions in particular.

Methods

MIRACLE Project investigators conducted their nationwide study of IRs from April 19, 2006 through June 24, 2006. We purchased mailing lists of library director names and addresses from Information Today's American Library Directory Online and Thompson-Peterson's. We sent e-mail messages to 2,147 library directors at four-year colleges and universities in the United States, asking them for their participation by first characterizing the extent of their involvement with IRs as follows: (1) implementation of an IR, (2) planning and pilot testing an IR software package, (3) IR planning only, or (4) no IR planning to date. In response to their answers to this question, we sent them a link to one of four survey instruments. Many of the same questions were listed across two or more of the survey instruments so that comparisons could be made based on the extent of the institutions' involvement with IRs. We used SurveyMonkey to collect these data online.

Some directors themselves completed the questionnaires, and others delegated the task to someone else at their institutions who was more knowledgeable about the institution's plans for IRs. When data collection closed in late June, we cleaned up the data, for example, by deleting empty questionnaires. When data cleaning was done, our study's response rate was 20.8 percent; a total of 446 institutions completed questionnaires.

Types of Institutional Participants in the MIRACLE Study

MIRACLE Project investigators asked respondents to characterize their involvement with IRs so that they answered questions that were appropriate to their stage in the overall IR effort. The majority (53 percent) of this study's respondents have done no IR planning to date, 20 percent are planning for IRs only, 16 percent are planning and pilot testing one or more IRs, and 11 percent are implementing or have implemented an IR.

To determine whether certain types of institutions were more or less likely to be involved with IRs, MIRACLE Project investigators turned to the Carnegie Classification of Institutions of Higher Education, which is "the leading framework for describing institutional diversity in U.S. higher education [and]...has been widely used in the study of higher education, both as a way to represent and control for institutional differences, and also in the design of research studies to ensure adequate representation of sampled institutions, students, or faculty."¹⁴

Investigators used the following six Carnegie Classifications to characterize study respondents: (1) master's colleges and universities that award at least 50 master's degrees per year, (2) baccalaureate colleges where baccalaureate degrees represent at least 10 percent of all undergraduate degrees and that award fewer than 50 master's degrees or fewer than 20 doctoral degrees per year, (3) research universities with very high or high research activity that award at least 20 doctoral degrees per year, (4) doctoral research universities that award at least 20 doctoral degrees per year, (5) special focus institutions where a high concentration of degrees is in a single field or set of related fields, and (6) tribal schools that are members of the American Indian Higher Education Consortium.¹⁵

The population of U.S. academic institutions that are classified in the Carnegie

Foundation classes that are this paper's object of study are: (1) 27.3 percent master's colleges and universities, (2) 29.3 percent baccalaureate colleges, and (3) 7.9 percent research universities. MIRACLE study respondents in these same classes are: (1) 37.2 percent (166) master's colleges and universities, (2) 27.6 percent (123) baccalaureate colleges, and (3) 18.6 percent (83) research universities.

Table 1. Carnegie Classes and the Extent of IR Involvement by MIRACLE Study Respondents

Carnegie classes	NP		PO		PPT		IMP		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Research univs.	13	5.5	14	15.2	26	37.1	30	62.5	83	18.6
Doctoral univs.	7	3.0	7	7.6	3	4.3	1	2.1	18	4.0
Master's	103	43.6	32	34.8	22	31.5	9	18.8	166	37.2
Baccalaureate	79	33.5	29	31.5	10	14.3	5	10.4	123	27.6
Special focus	32	13.6	9	9.8	8	11.4	3	6.2	52	11.7
Tribal	1	0.4	0	0.0	0	0.0	0	0.0	1	0.2
Unclassified*	1	0.4	1	1.1	1	1.4	0	0.0	3	0.7
Total	236	100.0	92	100.0	70	100.0	48	100.0	446	100.0

* 3 institutions are CCHE-unclassified because they responded with two or more institutions in partnership-like arrangements.

Table 1 shows the Carnegie Classifications of MIRACLE Study respondents, based on the extent of their involvement with IRs. Thirty (62.5 percent) of the 48 respondents whose institutions have implemented IRs are from research universities (RUs). All but four of the remaining respondents whose institutions have implemented IRs come from master's colleges and universities (18.8 percent) and baccalaureate colleges (10.4 percent). Institutions involved in IR planning only are more likely to be master's colleges and universities (34.8 percent) and baccalaureate colleges (31.5 percent) and less likely to be RUs (15.2 percent). Dominating the no-planning respondent type are master's colleges and universities (43.6 percent) and baccalaureate colleges (33.5

percent). Low percentages of RU respondents participating in the MIRACLE study are likely to be planning only (15.2 percent) or not planning at all (5.5 percent) for IRs.

Asked about IR planning, 53.3 percent of no-planning respondents generally foresee IR planning beginning within the next 36 months. Asked why they have not begun, a large percentage of respondents from M&BIs choose these reasons: (1) other priorities, issues, activities, and so on are more pressing than an IR (86.2 percent), (2) no available resources to support planning (71.7 percent), and (3) the desire to assess IRs at institutions like our own before taking the plunge (66.5 percent). Asked how MIRACLE Project activities can help them, several respondents want to learn more about IR implementation from institutions like their own. In their own words, these requests are:

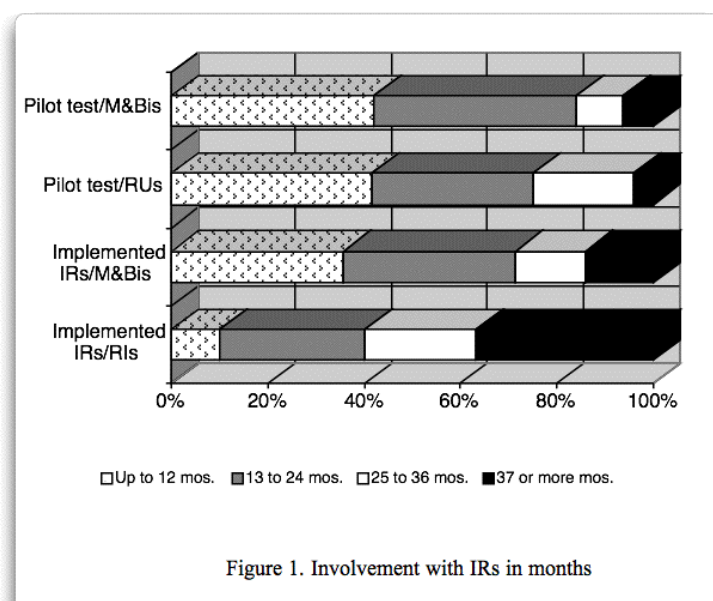
- "Would love to see models in a small, liberal arts college environment, particularly for consortial opportunities." (baccalaureate college from a southeastern state)
- "I believe that a full-fledged IR is beyond our capabilities at this point, but would be interested in continuing to hear about developments in this area, especially in small universities." (baccalaureate college from a Central Plains state)
- "Testimonials that cut to the heart of what each size institution can gain. ...From the smallest size institution, this is more than just adding a service. It could relate to a huge percentage of extremely tight resources." (baccalaureate college from a midwestern Great Lakes state)
- "Information on the various options and operating IRs at comparable colleges." (baccalaureate college from a northeastern state)

Institutional Repositories at Master's and Baccalaureate Institutions (M&BIs)

This section addresses these requests from staff at M&BIs for information about ongoing IR projects at institutions like their own, especially findings that are unique, distinctive, and different from findings about IRs at RUs where the majority of IR projects are underway.

Involvement with IRs

Questionnaires asked staff how long they have been involved with IRs. Figure 1 shows M&BI responses in 12-month ranges. Most long-running IRs are maintained by RUs; however, 14 percent of the operating IRs at M&BIs have been operational for over three years, as opposed to nearly 37 percent of operating IRs at RUs. Next, 71.4 percent of IRs at M&BIs and 40 percent of RU IRs have been operational for less than 24 months. Most M&BIs report that their planning and pilot testing activities have been going on for less than 24 months.



IR Investigative Activities

M&BI and RU respondents from institutions where IRs are being pilot tested or implemented are generally in agreement about their ratings for a dozen IR investigative activities. For example, high-rated investigative activities are: (1) learning about successful IR implementations at comparable institutions, (2) learning from reports of other institutions' IR planning, pilot testing IR software, and implementation activities to date, and (3) learning about successful implementations at a wide range of academic institutions. One important deviation comes from M&BI respondents at institutions where IR planning and pilot testing is going on. They rate learning about available expertise and assistance from a library consortium, network, group of libraries, and so on at the top, whereas all other respondents rate this activity exactly in the middle. Such a rating may be an indication that M&BI respondents who are in the planning and pilot testing stage of IR implementation may be intending to partner with other institutions for IR implementation.

Questionnaires asked respondents whether they conducted a needs assessment prior to implementing an IR. M&BIs with operational IRs (21 percent) were less likely than RUs with operational IRs (40 percent) to conduct a needs assessment; however, these percentages were about the same for M&BIs in the planning and pilot testing stage (25 percent) and RUs in the same stage (24 percent). Perhaps these lower percentages in investigative activities are indicative of a general acceptance of IRs in educational institutions. Having monitored what first-generation IR implementers have accomplished, second-generation implementers might not feel that a needs assessment is necessary.

The People Involved in the IR Effort

Questionnaires asked respondents to rate how active people with various organizational roles were in their institution's IR effort. Respondents at M&BIs and RUs agree that library staff, the library director, and the assistant library director are the most active.

When asked who is leading the IR implementation at their institution, respondents do not agree. Table 2 shows their responses.

Table 2. People Leading the IR Effort

Individual	Implementers %M&BIs	Implementers %RUs	Planning & pilot testers %M&BIs	Planning & pilot testers %RUs
Library director	63.6	14.8	35.5	17.4
A library staff member	9.1	37.0	19.4	26.1
Assistant library director	0.0	25.9	9.7	26.1
Your institution's CIO	9.1	0.0	0.0	0.0
Other	18.2	22.2	22.6	30.4
Your institution's archivist	0.0	0.0	6.5	0.0
A faculty member	0.0	0.0	3.2	0.0
No chair yet appointed	0.0	0.0	3.2	0.0
Total	100.0	100.0	100.0	100.0

At M&BIs where IR implementation is underway, the library director leads the IR implementation; and where IR planning and pilot testing is underway, the library director, archivist, or a faculty member may take the lead. At RUs, the library director, the assistant library director, a library staff member, or others such as associate directors of various library functions (such as the associate director for technology in the libraries or

associate director of collection development), scholarly communication coordinators, committee chairs, and consortium staff play the leading roles. At smaller institutions, library directors may be more likely to lead the IR effort because they cannot afford to keep a high number of staff members with specialized roles, and they need to maintain staff who cross-train and can work in various functions throughout the library.

The number of people at M&BIs and RUs who are involved with IR implementation averages 8.6 and 7.8, respectively. The average number of people decreases at M&BIs to 6.4 and increases at RUs to 10.8 during the IR planning and pilot testing phases. Such confusing averages may be due to the small number (9) of respondents from institutions where IRs are operational who answered this question.

Operational IRs at M&BI Institutions

Asked how many IRs are available to their institution's learning community, respondents give the numbers in table 3. Over 90 percent of M&BIs that have implemented IRs report only one IR at their institution. In contrast, one-third of the RU respondents identify two or more IRs. Given the breadth and depth of RUs, one or more academic or research units may be offering IR-like systems and services, possibly subject- or discipline-oriented IRs, to serve a worldwide network of researchers. Additionally, M&BIs may have fewer resources than RUs, and, thus, they may not be able to implement and maintain more than one IR. Although M&BIs are also choosing DSpace, they are demonstrating more variety than RUs in terms of system selection.

Table 3. Number of IRs

No. of IRs	Implementers %M&BIs	Implementers %RUs
1	92.9	66.7
2	7.1	23.3
3 or more	0.0	10.0
Total	100.0	100.0

Table 4 tells how respondents at M&BIs and RUs characterize their operational IR's host. M&BIs are opting for various alternatives that do not require them to go it alone—such as obtaining IR services from a consortium, entering into a partnership with a comparable institution, or negotiating with a for-profit vendor. RUs are much more likely than M&BIs to operate IRs on their own because they can afford to have several technicians to manage IR implementation and maintenance.

Table 4. IR Hosts

Host type	Implementers %M&BIs	Implementers %RUs
Your institution only	36.4	59.3
For-profit vendor	45.5	22.2
Partnership with one or more comparable institutions	9.1	11.1
Regional or state-based consortium	9.1	7.4
Total	100.0	100.0

With regard to IR features, M&BIs rate their IRs high on technical support. Such a high rating is to the credit of for-profit vendors and consortia from which the majority of M&BIs are obtaining IR services. Regardless of institutional type, all respondents rate their IR's features for controlled vocabulary searching and authority control at the bottom of a list of 14 features. Respondents from RUs also rate their IR's interface toward the

bottom. IR systems generally could benefit from improvements to all three system features that people use to retrieve digital content—user interface, controlled vocabulary searching, and authority control.

When asked how likely they are to modify their IR's software, respondents from the M&BIs and RUs do not agree on their answers. Table 5 shows the results. M&BIs are much less likely than RUs to modify their IR's software. Since the majority are partnering with other institutions, contracting with vendors of hosted systems, or receiving IR services from a consortium, they are less likely to have staff assigned to the IR that are able to modify the system. At RUs, 87.5 percent of IR staff report that they are likely to modify their IRs, which can involve complex programming knowledge. Since most RUs have implemented DSpace, they have systems staff handling IR maintenance and updates; thus, the job of modifying IR software can be accomplished by these staff.

Table 5. Likelihood of Modifying IR software

Responses	Implementers %M&BIs	Implementers %RUs
Very likely	12.5	58.3
Somewhat likely	50.0	29.2
Somewhat unlikely	12.5	8.3
Very unlikely	25.0	0.0
Don't know	0.0	4.2
Total	100.0	100.0

Respondents from the M&BIs and RUs are in agreement about sources of funding for the IR. Costs are absorbed in the library's routine operating costs, by a special initiative supported by the library, a regular line item in the library's budget, or a grant awarded by an external source.

Staff involved in IR planning and pilot testing at M&BIs and RUs estimate that they will make the decision whether or not to implement an IR over the next 6.7 and 4.6 months, respectively. IR staff at M&BIs and at RUs where IRs are operational think their institution will retain its current IR system for the next 2.9 and 3.4 years, respectively.

Contributors to the IR

Questionnaires asked respondents who were authorized contributors to their institution's IR. Table 6 gives the results; a "T" indicates a tied rating. Faculty and librarians top the list for both M&BI and RU respondents. Librarians and archivists are especially likely to be active contributors due to work assignments connected with digitizing and depositing special collections in the IR. Librarians and archivists may also act as proxies for faculty and research scientists who want to deposit content in the IR but have no time to do it.

Table 6. Authorized Contributors to Operational IRs

Contributor	Implementer M&BIs		Implementer RUs	
	Rank	%	Rank	%
Faculty	1T	78.6	1T	80.0
Librarians	1T	78.6	1T	80.0
Graduate students	3T	57.1	4T	56.7
Undergraduate students	3T	57.1	6	36.7
Archivists	5T	50.0	4T	56.7
Research scientists	7	42.9	3	63.3

At M&BIs, undergraduate students are much more likely to be active contributors than at RUs. When asked who is the major contributor to their institution's IR, a respectably large percentage (27.3 percent) of respondents at M&BIs singled out undergraduates (table 7). In fact, at M&BIs, undergraduates are as likely as faculty to be

the major contributor to the IR. This is a major way in which the nature of M&BIs—teaching-focused institutions—is reflected in the IRs' collection.

Table 7. The Major Contributor to Operational IRs

Contributor	Implementer M&BIs		Implementer RUs	
	Rank	%	Rank	%
Faculty	1T	27.3	1	37.0
Undergraduates	1T	27.3	–	0.0
Graduate students	3	18.2	2T	22.2
Librarians	4T	9.1	4	11.1
Archivists	4T	9.1	5	7.4
Academic support staff	4T-	9.1	–	0.0
Other	–	0.0	2T	22.2

Questionnaires asked respondents what they thought would be the most important reasons why people would contribute to the IR and provided a list of 15 options from which to choose. Respondents from both institution types consistently give very high ratings to three reasons: (1) to expose the particular scholar's intellectual output to researchers in North America and around the world who would not otherwise have access to it, (2) to boost the particular scholar's prestige, and (3) to increase the accessibility to knowledge assets such as numeric, video, audio, and multimedia databases.

There is less agreement between M&BIs and RUs on other reasons for contribution. Respondents at M&BI institutions also rate highly "to place the burden of preservation on the IR instead of on individual faculty members," whereas RU respondents viewed this factor as less of an impetus for people to contribute to the IR. RU respondents generally rate the statement "to expose your institution's intellectual output to researchers in North America and around the world who would not otherwise have access to it" in the middle of the pack. M&BI respondents put this reason third on

their lists. Perhaps M&BI respondents feel that IRs have the potential to level the playing field, giving small institutions the same mechanism as larger research institutions for making their institution's scholarship accessible to people around the world.

On the other hand, respondents at M&BIs rate the statement "to increase citation counts to the particular scholar's oeuvre" toward the bottom third of the list, whereas respondents at RUs rate it second. In the absence of open-ended remarks accompanying questionnaire responses, it is difficult to give an explanation why the M&BI respondents rate this reason so much lower than the RUs. Perhaps citations are much more important to RU faculty because they increase their chances for promotion, tenure, and merit increases, whereas M&BI faculty are also rewarded for excellence in teaching and service.

Respondents at M&BIs agreed entirely with respondents at RUs with regard to the most successful content recruitment methods: (1) staff working one-on-one with early adopters, (2) personal visits by IR staff to faculty and administrators, and (3) presentations by IR staff at departmental and faculty meetings.

Respondents' answers to a question about what was likely to inhibit their ability to deploy a successful IR reveal differences between respondent types, not between institution types. All respondents rated contributors' lack of knowledge about how they can benefit from IRs at or close to the top. M&BI respondents who are planning and pilot testing IRs rate convincing faculty that the IR will not adversely affect the current publishing model in the middle of a list of 13 reasons, whereas RU respondents where IRs have been implemented rate it second. This finding is noteworthy because it emphasizes how important the current publishing model is to faculty, research scientists,

fellows, and other research personnel at RUs. This model drives their behavior because their institution's reward structure is intimately tied to it. Efforts like IRs that have the potential to change the model may be viewed with skepticism and suspicion, so IR staff may have to emphasize IR benefits to faculty to alter their preconceived notions about its relationship to the publishing model. An explanation for the lower levels of concern among staff at M&BIs may be the more balanced emphasis on research, teaching, and service that exists at these institutions.

Absence of campus-wide policies mandating contributions of certain material types to IRs was an inhibiting factor that concerned staff at institutions where IRs have been implemented more than staff at institutions involved in IR planning and pilot testing. Such mandates may be more important to the former than the latter staff because the former have an operational IR at hand and feel an urgency to populate this tool with substantive content. IR staff were in agreement about the ratings for other inhibiting factors except for one—competing for resources with other priorities, projects, and initiatives. This was a factor that concerned staff where IR planning and pilot testing was going on regardless of institution type. Since these respondents are still in the planning phase of an IR effort, they may be more sensitive about competing for resources because their institution's decision-makers have not yet made the commitment to implement an IR, making the possibility that the IR effort will get derailed a reality.

Discussion

In a nationwide study of institutional repositories in U.S. academic libraries, most of the institutions that have not begun planning for institutional repository (IRs) services are

master's colleges and universities and baccalaureate colleges (M&BIs). A number anticipate that they will begin IR planning in the next three years. Although securing resources for the IR effort may be a problem, they want to learn what similar institutions are doing about IRs. This paper responds to their pleas in this regard.

At M&BI institutions where no IR effort or only IR planning is underway, library directors are taking the lead because they probably have fewer obstacles fielding inquiries from provosts and financial officers about funding and capital expenditures, from the chief information officer about needed technical expertise and equipment, and from the college archivist about conflicting roles and responsibilities. Library staff at M&BIs still have much to contribute. Knowledgeable of faculty and students, they can assess the faculty's interest in making submissions to the IR, learn from faculty what students are likely to submit, and collect faculty and student submissions during the pilot-testing phase of the IR effort.

Library staff at M&BIs are interested in learning more about IRs, especially concerning information pertaining to successful implementations at institutions like their own. Specifically they want to know about best practices, case studies, policy development, the benefits of IRs, IR system reviews, and research findings, such as findings from this MIRACLE Project study.

M&BI respondents at institutions where IR planning and pilot testing are underway rate learning about available expertise and assistance from a library consortium, network, group of libraries, and so on at the top; consequently, they may be more likely to seek IR services from various affiliated groups. Respondents expressed

their interests regarding consortia through their answers to open-ended questions.

Examples are:

- "We are in the process of investigating IR systems and are in talks with other colleges about our digital needs. A consortial agreement for an IR system would be ideal." (Planning-only respondent at a small private liberal arts college in a Great Lakes state)
- "Provide information about collaboratives, either within a consortium, a system, or amongst institutions with similar needs." (Planning-only respondent at a mid-sized master's university in a northern Great Lakes state)
- "Offer guidelines for partnering with other institutions." (No-planning respondent at a small public baccalaureate university in the Mountain West)
- "Best practice, identification of institutions like ours who have succeeded, formation or information about collaborative groups who have (or will have) a shared IR that we can join. We see a shared system as one of the more viable options." (No-planning respondent at a small private liberal arts college in the central Atlantic states)
- "Would love to see models in a small, liberal arts college environment, particularly for consortial opportunities." (No-planning respondent at a small master's university in the Southeast)

Deploying a successful IR depends on contributors. At both M&BIs and RUs, faculty, librarians, and graduate students are likely to be authorized contributors to IRs.

The former are more inclined than the latter to accept undergraduate students as contributors. Undergraduates may be *the* major contributor to IRs at M&BIs, not so at RUs. The emphasis on student contributions may be an important distinction between M&BIs and RUs. IR staff at both M&BIs and RUs are concerned that faculty will not contribute to the IR because faculty think it might upset the current publishing model, which is familiar and on which their institution's reward structure is built. M&BIs and RUs also share concerns about contributor inactivity due to their lack of knowledge about how the IR can benefit them and are conflicted about campus-wide mandates regarding mandatory contributions of certain material types to IRs.

An examination of this article's limitations is appropriate. Since few M&BIs have operational IRs, the number of M&BI institutions with operational IRs who participated in the MIRACLE Project study is small. Questionnaires enumerated several questions about IR policies, document types in pilot test and operational IRs, and the benefits of IRs that had many response categories. There were too few M&BI respondents for MIRACLE Project investigators to detect differences or trends between institution types based on the response categories they chose. Follow-up surveys and censuses should focus exclusively on M&BIs. More case studies of IR implementations at M&BIs are also needed. M&BI staff are ready for IRs, and they want to learn about successful IR efforts at comparable institutions.

Conclusion

Both master's colleges and universities and baccalaureate colleges (M&BIs) and research universities (RUs) call this new discovery tool an institutional repository but, in time, we

may see IRs at M&BIs that look qualitatively different from the IRs at RUs. For example, the digital contents of IRs at the former may be more oriented toward teaching objects than the products and by-products of research. Although we have no empirical evidence of this due to the small number of M&BI respondents with operational IRs who participated in the MIRACLE Project study, future researchers who survey the state-of-the-art in IR implementation should compare the contents of IRs at primarily teaching and primarily research institutions to determine differences in the contributors, content, and end users of these tools. It may be that IRs in M&BI institutions require new definitions, names, qualifiers, users, and uses.

Many M&BIs have not begun planning for institutional repository (IR) services. The MIRACLE Project study demonstrates that large numbers of these institutions will begin IR planning in the next three years. This paper responds to some of their requests for information about the IR deployment efforts of comparable institutions.

At M&BI institutions where IR planning has not begun, there is a sleeping beast of demand regarding IRs. They want to know how much IRs cost to plan, implement, and maintain, and what comparable institutions are doing with regard to IRs. Their interest in IRs is a wake-up call to their colleagues at other-than-research-universities to share with an audience that is eager to learn what their peers have to say about their success stories as well as cautionary tales about IRs.

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Notes

¹ See, for example: Mark Ware, "Institutional Repositories and Scholarly Publishing," *Learned Publishing* 17, 2 (2004): 115–24; Mark Ware Consulting, Ltd., "Publisher and Library/Learning Solutions (PALS): Pathfinder Research on Web-Based Repositories: Final Report," (January 2004), <http://www.palsgroup.org.uk/palsweb/palsweb.nsf/> (accessed January 18, 2008); Kathleen Shearer, "Survey Results—Summer 2004: CARL Institutional Repositories Project (September 2004)," http://www.carl-abrc.ca/projects/institutional_repositories/pdf/survey_results_2004-e.pdf (accessed January 18, 2008); Shearer, "The Carl Institutional Repositories Project: A Collaborative Approach to Addressing the Challenges of IRs in Canada," *Library Hi Tech* 24, 2 (2006): 165–72; and Charles W. Bailey, Jr., et al., "Executive Summary," *SPEC Kit 292 Institutional Repositories* (Washington, D.C.: Association of Research Libraries, 2006), 13, <http://www.arl.org/bm~doc/spec292web.pdf> (accessed January 18, 2008).

² Clifford A. Lynch and Joan K. Lippincott, "Institutional Repository Deployment in the United States as of Early 2005," *D-Lib Magazine* 11, 9 (2005), <http://www.dlib.org/dlib/september05/lynch/09lynch.html> (accessed January 11, 2008).

³ Karen Markey, Soo Young Rieh, Beth St. Jean, Jihyun Kim, and Elizabeth Yakel, *Census of Institutional Repositories in the United States: MIRACLE Project Research Findings* (Washington, D.C.: Council on Library and Information Resources, February 2007), <http://www.clir.org/pubs/reports/pub140/pub140.pdf> (accessed January 11, 2008).

⁴ To simplify reporting in this paper, the acronym M&BIs is used to represent the combination of staff responses from master's colleges and universities and baccalaureate institutions while the acronym RUs is used to refer to research universities.

⁵ See, for example: Shearer, Survey Results; Shearer, "The Carl Institutional Repositories Project"; and Bailey et al.

⁶CARL ABRC, "Fact Sheet," Canadian Association of Research Libraries (2005), <http://www.carl-abrc.ca/about/factsheet-e.html> (accessed January 11, 2008); Association of Research Libraries, "Membership: Principles of Membership in the Association of Research Libraries," Association of Research Libraries (2007), <http://www.arl.org/arl/membership/qualprin.shtml> (accessed January 11, 2008).

⁷ Lynch and Lippincott.

⁸ Mark Ware; Mark Ware Consulting, Ltd.

⁹ Ithaka, *Ithaka's 2006 Librarian and Faculty Studies: Overview of Key Findings* (New York, NY: Ithaka, 2006), 3, <http://www.ithaka.org/research/Ithaka.Surveys.2006.Overview.pdf> (accessed January 11, 2008).

¹⁰ Christopher W. Nolan and Jane Costanza, "Promoting and Archiving Student Work through an Institutional Repository: Trinity University, LASR, and the Digital Commons," *Serials Review* 32, 2 (2006): 92–8; John-Bauer Graham, Bethany Latham Skaggs, and Kimberly Weatherford Stevens, "Digitizing a Gap: A State-wide Institutional Repository Project," *Reference Services Review* 33, 3 (2005): 337–45; and Marianne A. Buehler and Adwoa Boateng, "The Evolving Impact of Institutional Repositories on Reference Librarians," *Reference Services Review* 33, 3 (2005): 291–300.

¹¹ Nolan and Costanza.

¹² Graham, Skaggs, and Stevens.

¹³ Buehler and Boateng.

¹⁴ The Carnegie Foundation for the Advancement of Teaching, "Classifications: The Carnegie Classification of Institutions of Higher Education," The Carnegie Foundation for the Advancement of Teaching (2006), <http://www.carnegiefoundation.org/classifications/index.asp> (accessed January 11, 2008).

¹⁵ The Carnegie Foundation for the Advancement of Teaching, "Classifications: Lookup & Listings," The Carnegie Foundation for the Advancement of Teaching (2006), <http://www.carnegiefoundation.org/classifications/index.asp?key=807> (accessed January 18, 2008).