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INFORMATION LITERACY, COLLABORATION, AND TEACHER EDUCATION

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ABSTRACT

Information literacy (IL) is a critical component of a 21st century education. Education professors are confronted with the responsibility of teaching information literacy on two levels since pre-service teachers need to become proficient in IL skills for their own success and also need to learn how to teach their future students to become information literate (Branch, 2003; Carr, 1998; Hinchcliffe, 2003). In an effort to determine the extent to which teacher education programs incorporate information literacy instruction, researchers at a large midwestern university conducted a survey of teacher education faculty in selected states. The survey sought to gather data related to faculty knowledge, inclusion, and assessment of information literacy in teacher education programs, and the degree to which there was collaboration between librarians and faculty in the teaching of information literacy skills.

INTRODUCTION

There is wide and growing recognition that teaching students information literacy (IL) skills is a critical component of a 21st century university education. While it is important that all students are information literate, it may be even more critical for those students planning to become teachers since they need to be able to model and teach information literacy skills effectively to their future students (Carr, 1998; O'Hanlon, 1987; Witt, 2003). In an effort to determine the extent to which teacher education programs incorporate information literacy instruction, researchers at a large midwestern university conducted a survey of teacher education faculty in selected states (Alaska, Colorado, Connecticut, Kansas, Missouri, Montana, Nevada, North Carolina, North Dakota, Ohio, Oklahoma, Rhode Island, Texas, Utah, Vermont, and Wisconsin). The survey sought to gather data related to faculty knowledge, inclusion, and assessment of information literacy in teacher education programs, and the degree to which there was collaboration between librarians and faculty in the teaching of information literacy skills. Although there have been other information literacy surveys of academic librarians, the largest of which being the one conducted by the Association of College and Research Libraries (ACRL) in 2001 (Sonntag, 2001), there have not been similar efforts to assess specifically the perceptions of education faculty in regards to information literacy and faculty-librarian collaboration for information literacy.

The importance of incorporating information literacy into all levels of education has been advocated for many years by the American Association of School Librarians (AASL). In 1998, AASL, in conjunction with the Association for

Educational Communications and Technology (AECT), developed "Information Power," a conceptual framework and related guidelines deemed essential for becoming information-literate (American Association of School Librarians and Association for Educational Communications and Technology, 1998). In addition to the work of professional associations in promoting information literacy as good practice, both state and national accrediting bodies have advocated its importance in teacher education. One standard from the National Council for Accreditation of Teacher Education (NCATE) states that teacher education candidates should be "able to appropriately and effectively integrate technology and information literacy in instruction to support student learning" (2008). Similarly, the California Commission on Teacher Credentialing (2007) includes this statement: "Each participating teacher designs, adapts, and uses lessons which address students' needs to develop information literacy and problem solving skills as tools for lifelong learning."

Individual states have also incorporated information literacy into their pre-kindergarten through twelfth grade (PK-12) content standards thereby identifying the knowledge and skills that students should have at specific grade levels. (see for example, a breakdown of Ohio's information literacy standard according to K-12 benchmarks at http://www.infohio.org/LibraryStaff/ODEosic/full_osic_list.asp?osic=Y2003.CLB.S05&content_area_guid=26241&standard_guid=26637). Like the accrediting bodies, state standards provide a concrete reason for paying attention to information literacy in curriculum development and in teacher education programs.

In higher education, too, information literacy standards exist. In 2000, the Association of College and Research Libraries (ACRL) published “Information Literacy Competency Standards for Higher Education” (2000). The ACRL standards, combined with state and professional standards for PK-12, provide a framework to assess an individual’s information literacy skills throughout his or her formal education.

REVIEW OF THE LITERATURE

Information literacy for PK-12 teachers encompasses two dimensions, information literacy skills and information literacy standards. Information literacy skills refer to an individual’s ability “to know when there is a need for information, [and] to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand” (National Forum on Information Literacy, n.d.). Information literacy standards, on the other hand, are curriculum standards generally developed at the state level that identify what PK-12 students should know and be able to do at various stages of their education.

Information literacy is not new. For over thirty years, librarians have stressed the need for information literacy at virtually all stages of education. In higher education institutions, many programs, workshops, and tutorials now exist to help teach students information literacy skills. However, there is still widespread belief by faculty that students come to institutions of higher learning with these skills intact (Asselin & Lee, 2002; Shaffer, Finkelstein, & Woelfl, 2004), or that students will simply pick up these skills on their own, over time (Badke, 2008; Leckie & Fullerton, 1999; McGuinness, 2006).

Predictably, universities use multiple strategies to teach information literacy skills. Common strategies include stand alone online modules (Farmer, 2003), projects and activities embedded in content courses (Asselin & Lee, 2002; Brendle-Moczuk, 2006; Thornton, 2008), credit and non credit required courses (Black, Crest, & Volland, 2001; Cooley & Zhang, 1998; Scales & Lindsay, 2005; Scales, Matthews, & Johnson, 2005), team teaching (Hooks & Corbett, Jr., 2005), guest lectures by librarians (McGuinness, 2006), and workshops (Floyd, Colvin, & Bodur, 2008). Many of these strategies are the result of collaboration between academic librarians and faculty.

LIBRARIAN–FACULTY COLLABORATION

As the importance of information literacy as a skill for lifelong learning has grown, librarians and faculty are beginning to realize that they share a common goal in insuring that students acquire the knowledge and skills necessary to be information literate. Raspa and Ward (2000) point out that “neither librarians nor instructional faculty can adequately teach the research process in isolation from each other” (pp. 15 -16). This reality is reflected in the many successful librarian–faculty collaborative projects found in the literature (see, for example, Bhavnagri & Bielat, 2005; Black, Crest, & Volland, 2001; Floyd, Colvin, & Bodur, 2008; Gallegos & Wright, 2000; Lampert, 2005; Scales, Matthews, & Johnson, 2005; Witt & Dickinson, 2003).

These collaborative partnerships between faculty and librarians are seen as essential in order for students to master information literacy skills within the context of various content areas (Cook, 2000; Haycock, 1999; Mackey & Jacobson, 2005; Raspa & Ward,

2000; Scales, Matthews, & Johnson, 2005). However, collaboration can be a difficult process and barriers exist that can hamper such endeavors (Black, Crest, & Volland, 2001; McGuinness, 2006; Stevens, 2006). Collaboration has been described as uncomfortable and confusing (Scales, Matthews, & Johnson, 2005), and can be especially problematic if faculty and librarians misunderstand each other's perspectives and responsibilities in relation to information literacy (Given & Julien, 2005; Leckie & Fullerton, 1999). Another potential problem relates to librarians who may be seen as not having sufficient knowledge about teaching and learning to be effective teachers (Johnston & Webber, 2003).

Perhaps the biggest barrier to collaboration is when information literacy is viewed solely as a library responsibility (Farmer, 2007; Mackey & Jacobson, 2005). This perspective may seriously impede dialogue and discussion of information literacy at not only departmental levels, but also at university-wide levels where, increasingly, the focus is on creating information literate, life-long learners. Some authors suggest that institutional culture also influences how information literacy is perceived by faculty (Black, Crest, & Volland, 2001; Stevens, 2006) and that collaborative efforts may need to be initiated by librarians (Stevens, 2006).

Recognizing the many barriers that can compromise and derail collaborative projects involving the integration of IL across the curriculum, there are numerous articles that offer models (Brasley, 2008; Bruce, Edwards, & Lupton, 2006) and strategies (Mackey & Jacobson, 2005; Travis, 2008) that can assist librarians and faculty as they work together toward successful and mutually beneficial

collaborations. These collaborations often result in the inclusion of information literacy in teacher education programs.

INFORMATION LITERACY IN TEACHER EDUCATION

There is evidence in the literature that teacher education programs may not be doing an adequate job in preparing future teachers in information literacy skills and knowledge (Carr, 1998; Asselin & Doiron, 2003) even though there are indications that successful efforts in integrating information literacy occur (Bhavnagri & Bielat, 2005; Earp, 2009; Farmer, 2003; Floyd, Colvin, & Bodur, 2008) or are in the process of occurring (Witt & Dickinson, 2003). Certainly there is increased awareness among teacher education faculties that information literacy is important (Bhavnagri & Bielat, 2005; Duke & Ward, 2009) especially since national, professional, state, and local standards now include information literacy as an integral component of what PK-12 students should know and be able to do (refer to Henderson & Scheffler, 2003, for an overview of existing standards that include IL). In addition, professional organizations such as ALA and ACRL strongly recommend that IL be included in pre-service teacher education (Branch, 2003).

It has long been acknowledged that pre-service teachers need to gain content knowledge about the subjects they will teach as well as the methods and strategies to teach those subjects effectively. More recently attention has been focused in some institutions on the need for future teachers to master both information literacy knowledge for their own success and the pedagogical techniques of how to work effectively with their future students to assist them in attaining IL learning goals

(Asselin, 2004; Asselin & Doiron, 2003; Branch, 2003; Hinchcliffe, 2003; Lee, 2002; Witt & Dickinson, 2003).

The dual nature of information literacy instruction within a teacher education program makes teaching IL to pre-service teachers complex and multifaceted (Hinchcliffe, 2003). Pre-service teachers need to be able to create effective lessons and assignments that will teach their future students “the skills, strategies, and attitudes that are part of information literacy” (Branch, 2003, p. 34). Scaffolding, modeling, and peer teaching are three strategies that are offered as being effective ways that teacher educators and librarians can teach the processes involved with information literacy and help students to see relationships to pedagogy (Asselin & Doiron, 2003; Bhavnagri & Bielat, 2005; Henderson & Scheffler, 2003; Hinchcliffe, 2003; Witt & Dickinson, 2003). Birch, Greenfield, Janke, Schaeffer & Woods (2008) provide details of several initiatives that paired librarians with teacher education faculty in order to teach NCATE (National Council for Accreditation of Teacher Education) information literacy and technology standards.

ASSESSMENT OF INFORMATION LITERACY KNOWLEDGE AND SKILLS

Assessment of the IL skills of pre-service teachers can help education programs identify deficiencies and strengths in their curriculum and insure that those who are ready to take their place at the front of the classroom have the tools to incorporate information literacy into their lesson plans as well as the skills to locate and evaluate information in their own profession.

Although the literature shows that information literacy is being incorporated into the curriculum of a number of teacher education programs, there are fewer examples of IL skills being assessed in those same programs (Emmons et al., 2009). This is not to say that colleges and universities are failing to assess students’ information literacy skills overall. At institutions with a strong culture of assessment, there are examples of information literacy skills being evaluated across the curriculum (Schroeder & Mashek, 2007) as well as structured assessment of first-year students (Cameron, Wise, & Lottridge, 2007; Ferrer-Vinent & Carello, 2008). This buy-in to assessment is sometimes linked to mandates from accrediting agencies such as the Middle States Commission on Higher Education (2003). On most campuses, however, information literacy skills are evaluated only in selected courses or departments, or at the end of a class session in which students are introduced to information literacy skills. Information literacy assessment is also most likely to be initiated by librarians rather than classroom faculty.

Across the curriculum, multiple strategies are employed in the assessment of IL skills (Neely, 2006; Radcliff, Jensen, Salem, Burhanna, & Gedeon, 2007; Suskie, 2004). These include knowledge tests such as Project SAILS (Standardized Assessment of Information Literacy Skills) developed at Kent State University (Project SAILS, 2000-2009), classroom assessment techniques (Angelo & Cross, 1993), performance assessments like the ICT (Information & Communication Technology) Literacy Assessment (now called the iCritical Thinking certificate, see <https://www.ets.org/icriticalthinking/about>) developed by the Educational Testing

Service (Brasley, 2006), and focus groups (Spackman, 2007).

One assessment technique that is used frequently to evaluate students enrolled in teacher education programs is that of the portfolio (Lin, 2008; Milman, 2005; Wray & Zeichner, 2001). Incorporating an information literacy component into portfolios has shown to be effective for some institutions (Diller & Phelps, 2008; Fourie & van Niekerk, 1999; Sharma, 2007) and this approach allows education faculty to introduce IL assessment into a model with which they are already familiar. Increasingly, those doing assessment are employing rubrics (Knight, 2006; Oakleaf, 2008) as a way of providing students with clear expectations for how their work compares to a predefined set of criteria. Although assessment of information literacy skills is being done in many colleges and universities whether at the classroom, program or institution level, more evaluation of the IL skills of future teachers is needed.

METHODOLOGY

Discussions at our university between librarians and education faculty, as well as anecdotal reports from colleagues across our state as part of outreach done by the Institute for Library Information Literacy Education (<http://www.ilile.org>), reinforce the literature findings (Duke & Ward, 2009) related to the minimal inclusion of information literacy in the teacher education curriculum, particularly in terms of teacher preparation for future teaching of those skills. Feedback received from discussions with school library media specialists indicate that there is an overwhelming perception that teachers who are recent graduates are not aware of the role the library can play in teaching information

literacy fluency and that K-12 teachers themselves may lack knowledge of information literacy skills. This feedback is corroborated by Duke & Ward's (2009) metasynthesis of literature related to IL and teacher education, where one of their findings indicate that both preservice and in-service teachers "often lack adequate information literacy skills" (p. 251).

In an effort to determine whether these observations are reinforced at a national level and to assess the extent that teacher education programs incorporate information literacy instruction, we conducted a survey of teacher education faculty in selected states. The 14-item survey was structured to help determine the status of information literacy within teacher education programs and was developed to help answer five research questions:

1. Do education faculties collaborate with academic librarians on information literacy issues?
2. What knowledge do education faculties have about information literacy standards?
3. How do education faculties incorporate information literacy knowledge and skills into their courses?
4. What barriers do education faculties encounter when trying to integrate information literacy into their courses?
5. Are information literacy competencies assessed for pre-service teachers?

The survey targeted teacher education faculty from states in which information literacy or information technology are already incorporated in some way into state standards. Guiding the selection process was a document produced by the Pacific Bell/

UCLA Initiative for 21st Century Literacies (2000). The initiative searched departments of education for all fifty states to identify references to information literacy. The search resulted in:

- Nine states that addressed information literacy within their technology standards (Alabama, Alaska, Arizona, Hawaii, Louisiana, Maine, New York, Utah, and West Virginia)
- Nine states that integrated information literacy across at least three curriculum areas (Massachusetts, Michigan, Mississippi, Montana, New Hampshire, Oklahoma, Pennsylvania, Tennessee, and Vermont)
- Eight states that did not address information literacy (Idaho, Indiana, Iowa, Kansas, Maryland, Rhode Island, South Dakota and Wyoming)
- Six states that were in the process of developing an information literacy framework (Colorado, Connecticut, Delaware, Georgia, North Carolina and Wisconsin)
- Five states that were developing information literacy in two curricular areas (Nebraska, Nevada, North Dakota, Texas and Washington)
- Five states that incorporate information literacy in language/ arts curriculum (Arkansas, Illinois, New Mexico, Ohio and Virginia)
- Five states incorporating information literacy as part of a workforce readiness curriculum (California, Florida, Minnesota, New Jersey, and Oregon)

- Three states that identified information literacy as a main curriculum goal (Kentucky, Missouri, and South Carolina)

From this list, we selected a variety of states that either already addressed information literacy standards or that were in the process of developing an information literacy framework. As mentioned in the introduction, the states included were Alaska, Colorado, Connecticut, Kansas, Missouri, Montana, Nevada, North Carolina, North Dakota, Ohio, Oklahoma, Rhode Island, Texas, Utah, Vermont, and Wisconsin. This approach was used because of the assumption that it would be important for education faculty in these states to stress to pre-service teachers that they will need to teach to standards. It was further hypothesized that if information literacy was identified as a state standard, then presumably education faculty would feel an obligation to incorporate those skills into coursework.

The CollegeSource database (www.cgf.org) was then used to search for colleges and universities in the 16 selected states that offered the bachelor's degree in education. This search resulted in a list of 154 institutions of higher education. Each institution's dean or academic officer responsible for the education program was then identified through the institution's web site, and that person's email address was retrieved.

A brief description of the 14-item online survey (see Supplementary Files) and a request to complete it was emailed to the identified contact person at each of the institutions. The contact person was asked to distribute the email via a departmental listserv or through an email distribution list

to education faculty. As a reminder, an identical emailing was subsequently sent to those same institutions to solicit more respondents.

A total of 160 survey responses from at least 46 institutions across 16 states were received from teacher educators. Data analysis used descriptive statistics followed by cross-tabulation of variables to identify significant relationships.

RESULTS

Demographically, responses from teacher education faculty were received from both public (55%) and private (45%) institutions. The majority of respondents primarily teach undergraduate courses (63%), with 33% teaching primarily at the master's level and approximately 3% whose main responsibility is at the doctoral level. Respondents teach in a variety of programs including early childhood (7%), elementary education (26%), middle childhood education (3%), secondary education (12%), post secondary education (8%), and adult education (1%). In addition, over 30% of the respondents indicated they teach in multiple programs or in areas not identified in the survey options, such as library media, instructional technology, and special education (9%).

In terms of the number of years the respondents have been teaching in teacher education programs, the results were fairly evenly distributed, with close to 25% in each of three categories: 1-5 years (26%), 6-10 years (25%), and 11-20 (28% years). Almost 15% have taught 21-30 years, and approximately 6% have over 30 years of experience. Most respondents also had experience teaching at the PK-12 level, ranging from 1-5 years (27%), 6-10 years (25%), 11-20 years (28%), 21-30 years

(9%), and over 30 years (7%).

Results from the survey are presented below and are grouped according to the research questions. Not included in the figures is the number of "Unable to answer" and "Don't know" responses. These responses were excluded since they did not contribute meaningful information to the interpretation and analysis of the results. We hypothesize that "unable to answer" responses indicated instances where the respondent truly did not know enough about the question being asked to select one of the provided responses. For instance, respondents may not be aware of whether IL is required on their campuses, especially if IL is not the responsibility of their department. The "don't know" answers may have been a function of the survey asking for information that respondents were not qualified to give.

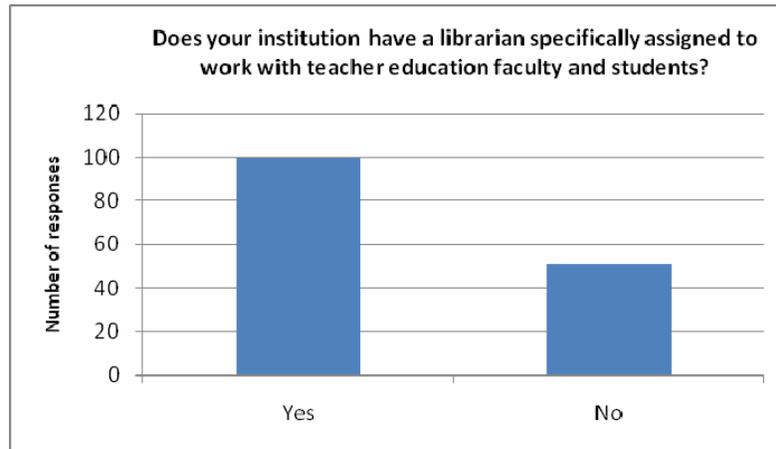
Research Question 1. Do education faculties collaborate with academic librarians on information literacy issues?

Questions 2 and 3 from the survey provide information related to this research question. Results from these two questions show that most institutions have academic librarians assigned to teacher education programs (Figure 1) and most teacher educators have collaborated with a librarian concerning information literacy (Figure 2).

Research Question 2. What knowledge do education faculties have about information literacy standards?

Questions 1, 2, and 5 from the survey address this research question. As shown in Figure 3, teacher education faculties

FIGURE 1 — ARE LIBRARIANS ASSIGNED TO WORK WITH TEACHER EDUCATION PROGRAMS?



indicate that the majority of information literacy standards are embedded in their respective state's content standards. Responses from question 2 indicate that close to 80% of teacher education students are receiving instruction in information literacy (Figure 4). And almost half of the respondents identified ISTE (International Society for Technology in Education) standards as the standards they use for information literacy (Figure 5).

Research Question 3. How do

education faculties incorporate information literacy knowledge and skills into their courses?

Questions 6, 7, and 9 from the survey are related to this research question. A variety of methods are used by institutions of higher education for teaching IL. Figure 6 identifies six different approaches to IL instruction as well as a small number of responses that indicated IL is not taught at their institution. There is strong consensus among institutions as to the IL skills that are

FIGURE 2 — HAVE TEACHER EDUCATION FACULTIES COLLABORATED WITH LIBRARIANS?

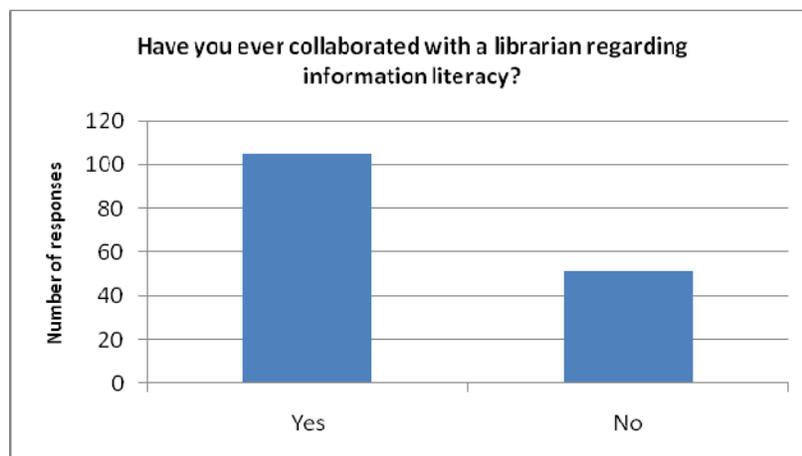


FIGURE 3 — IN WHICH STANDARDS ARE IL STANDARDS LOCATED IN YOUR STATE?

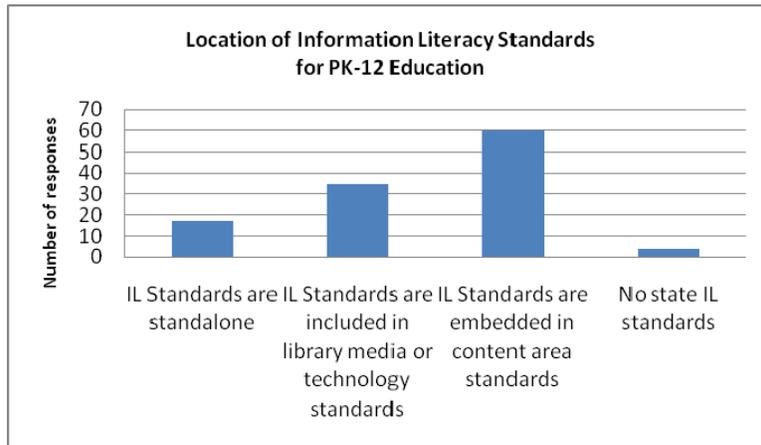


FIGURE 4 — DOES YOUR INSTITUTION TEACH STUDENTS ABOUT IL?

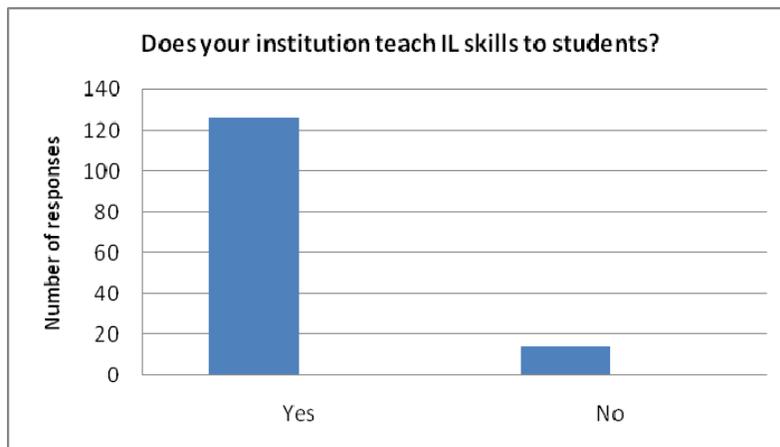


FIGURE 5 — NATIONAL INFORMATION LITERACY STANDARDS USED IN TEACHING

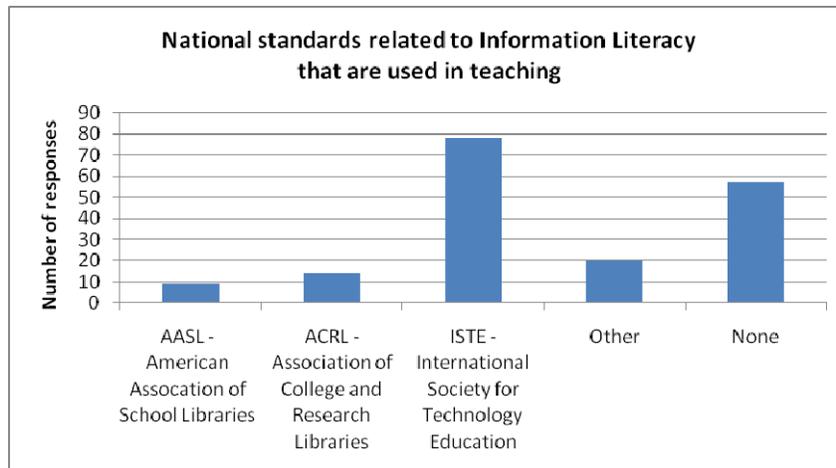
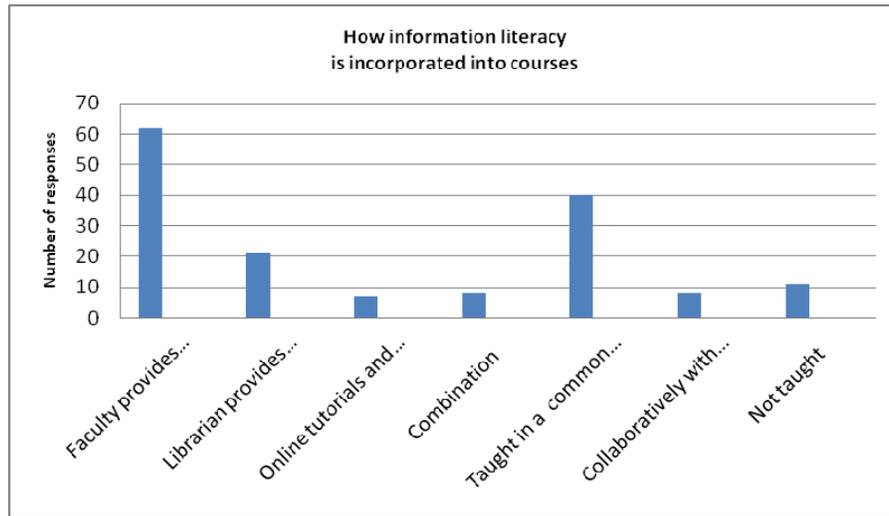


FIGURE 6 — HOW INFORMATION LITERACY INSTRUCTION IS INCORPORATED INTO COURSES



taught, as shown in Figure 7, and the majority of teacher education faculties have changed or modified their course(s) to incorporate some aspect of information literacy (Figure 8). The types of course changes that have been made are identified in Figure 9.

Research Question 4. What barriers do education faculties encounter when trying to integrate information literacy into their courses?

Questions 8 and 10 dealt with barriers. Whether integrating IL skills or IL standards, teacher education faculties encountered similar barriers; the most common barrier was lack of time, as shown in Figure 10.

Research Question 5. Are information literacy competencies assessed for pre-service teachers?

Questions 11, 12, 13, and 14 are related to IL assessment issues. Although a large

FIGURE 7 — INFORMATION LITERACY SKILLS THAT ARE TAUGHT

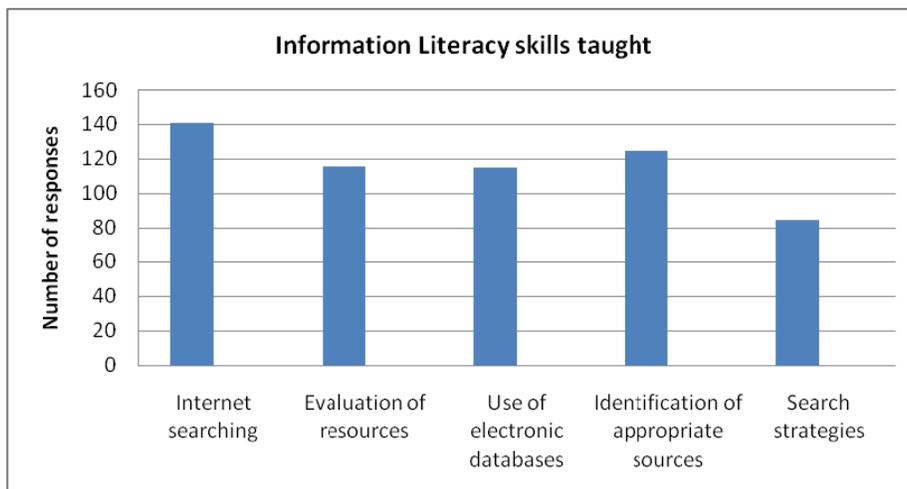


FIGURE 8 — NUMBER OF FACULTIES WHO HAVE CHANGED THEIR COURSES TO INCLUDE IL

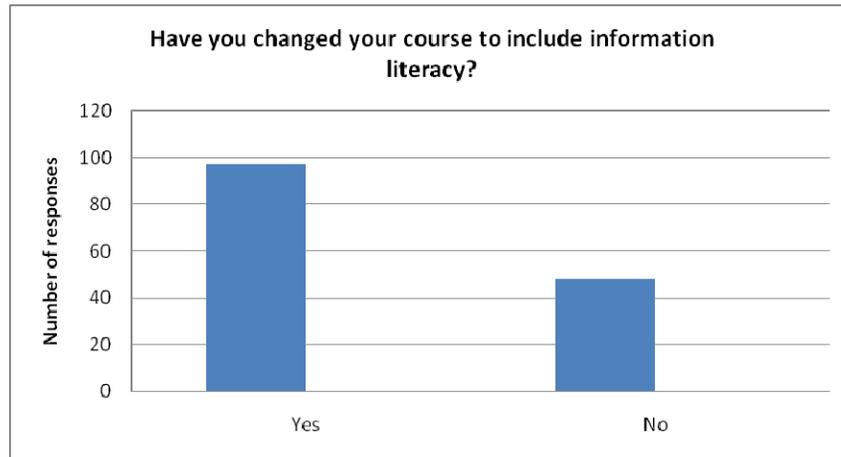


FIGURE 9 — HOW COURSES HAVE BEEN CHANGED OR MODIFIED

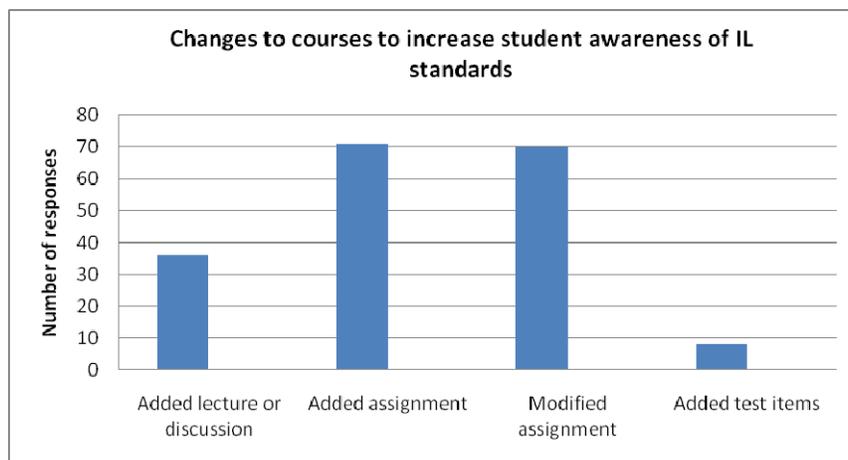


FIGURE 10 — BARRIERS TO INCORPORATING IL SKILLS AND STANDARDS INTO COURSES

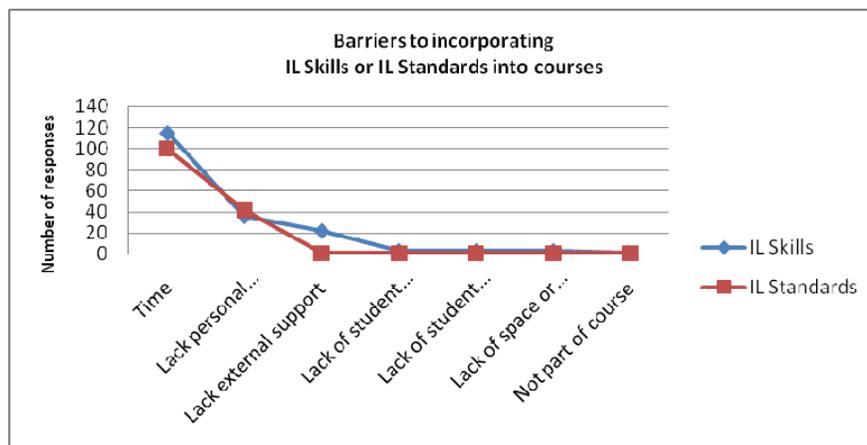
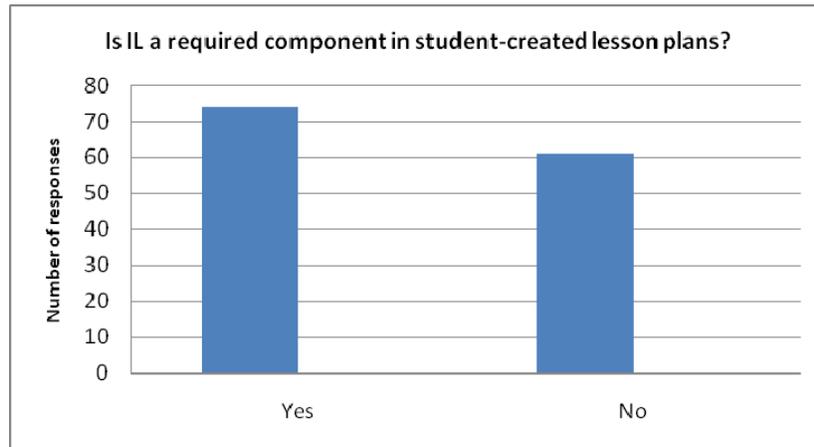


FIGURE 11 — INFORMATION LITERACY AS A COMPONENT IN STUDENT-CREATED LESSON PLANS



number of respondents indicated that their pre-service teachers need to include IL in the lesson plans created during the teacher education program (Figure 11), many respondents indicated they do not have evidence that their graduates are actually teaching IL to K-12 students (Figure 12). A slightly higher number of responses indicated that there are graduation requirements in IL as opposed to those who indicated there are no IL requirements for graduation (Figure 13). For teacher educators who use an IL assessment (Figure

14), the majority use a portfolio (Figure 15).

Significant cross-tabulation results

Upon completing cross-tabulations across the survey questions, significant results ($p < 0.05$) were categorized into three areas, (1) collaboration between academic librarians and education faculty, (2) differences by institution type, and (3) significant relationships by years of teaching. Each of these areas is discussed separately.

FIGURE 12 — DO TEACHER EDUCATORS HAVE EVIDENCE THAT GRADUATES ARE TEACHING IL TO THEIR STUDENTS?

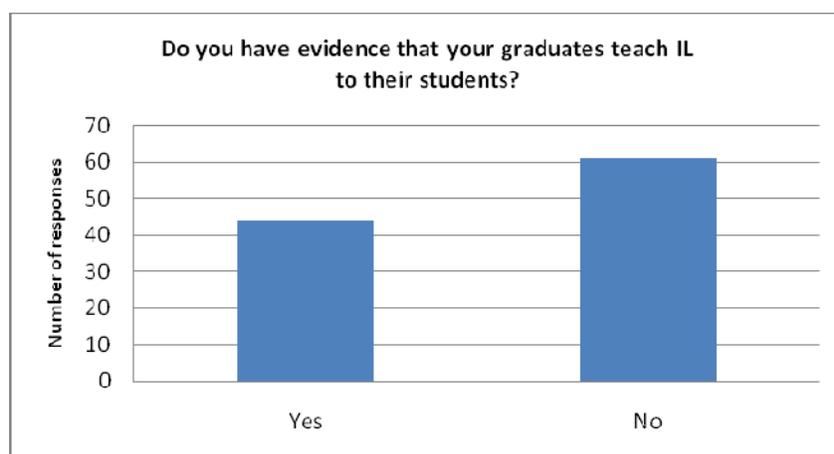


FIGURE 13 — ARE THERE REQUIRED IL COMPETENCIES FOR GRADUATION?

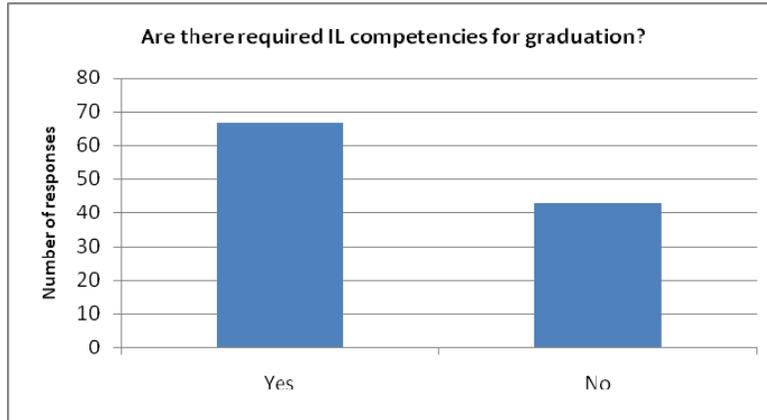


FIGURE 14 — DOES YOUR INSTITUTION HAVE AN ASSESSMENT TOOL FOR IL COMPETENCY?

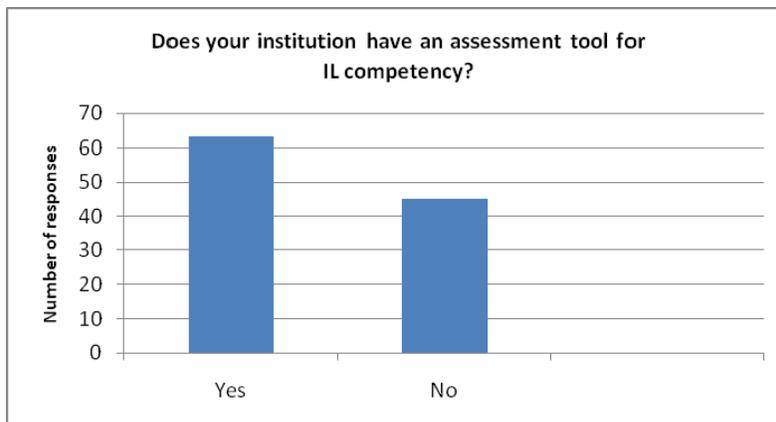
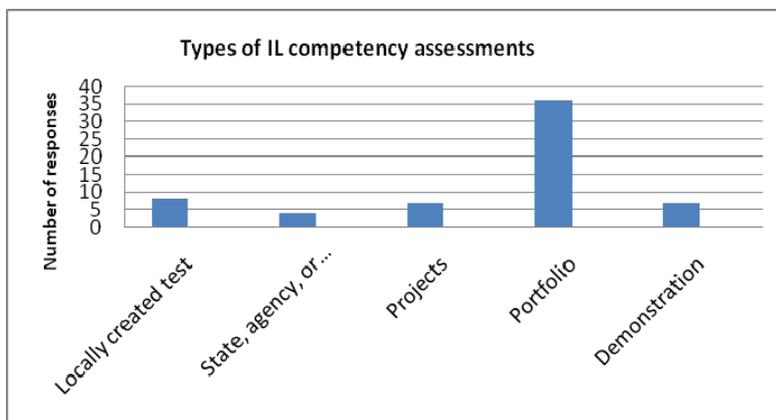


FIGURE 15 — TYPES OF ASSESSMENT INSTRUMENTS



Collaboration between academic librarians and education faculty

Almost two-thirds of the respondents to the survey indicated that students receive instruction in information literacy skills, that their college or university has a librarian specifically assigned to work with faculty and students, and that they have collaborated with a librarian to integrate information literacy instruction into their courses. However, respondents who do not have a librarian assigned to work with them perceive there is a lack of external support to incorporating IL skills into their courses ($\chi^2=6.248$, $\rho=0.044$, $\phi=0.195$).

There were several significant findings related to survey participants who collaborated with a librarian. These findings are presented in Table 1.

DIFFERENCES BY INSTITUTION TYPE

Approximately 55% of the survey responses were received from teacher educators at public institutions, with 45% of the responses from those that teach at private institutions. When comparing responses based on institution type, results indicated that instructors at public institutions were significantly more likely to use ISTE

TABLE 1 — SIGNIFICANT CORRELATIONS FOR TEACHER EDUCATOR—LIBRARIAN COLLABORATIONS

Teacher educators who collaborate with a librarian are more likely to:	Relevant statistics
Use AASL standards in their teaching rather than other IL standards.	$\chi^2=7.937$, $\rho=0.019$, $\phi=0.220$
Have a librarian instruct their classes in IL skills.	$\chi^2=29.899$, $\rho=0.008$, $\phi=0.428$
Teach	
Internet searching	$\chi^2=8.973$, $\rho=0.011$, $\phi=0.234$
use of electronic databases,	$\chi^2=8.352$, $\rho=0.015$, $\phi=0.226$
identification of appropriate resources, and	$\chi^2=8.514$, $\rho=0.014$, $\phi=0.228$
formulating search strategies.	$\chi^2=14.46$, $\rho=0.001$, $\phi=0.297$
Perceive they have external support for incorporating IL skills in their teaching.	$\chi^2=7.190$, $\rho=0.027$, $\phi=0.209$
Alter their course to increase student knowledge of information literacy skills by	$\chi^2=15.515$, $\rho=0.004$, $\phi=0.309$
adding a new assignment, or	$\chi^2=7.223$, $\rho=0.027$, $\phi=0.210$
modifying an existing assignment.	$\chi^2=12.863$, $\rho=0.002$, $\phi=0.280$
State that their school has information literacy competencies that must be satisfied for graduation.	$\chi^2=10.172$, $\rho=0.038$, $\phi=0.250$
Indicate they have an assessment tool to measure those competencies.	$\chi^2=10.511$, $\rho=0.033$, $\phi=0.253$

standards than instructors at private institutions ($\chi^2=4.876$, $\rho=0.027$, $\phi=-0.173$) while instructors at private institutions were more likely to indicate that they do not use information literacy standards in their teaching ($\chi^2=7.831$, $\rho=0.005$, $\phi=0.220$). Based on these findings, it was not surprising that teacher educators at private institutions were also more likely to state that their institution does not have an assessment tool to determine student IL competency ($\chi^2=6.544$, $\rho=0.038$, $\phi=0.201$). Interestingly, teacher educators at public institutions were significantly more likely to state that lesson plans were not part of their courses when asked if IL is a required component in student-created lesson plans ($\chi^2=7.009$, $\rho=0.030$, $\phi=0.208$).

RELATIONSHIPS BY YEARS OF TEACHING

When examined by years of teaching, the results indicated that instructors with more years of teaching were significantly more likely to:

- provide training in information literacy skills than less experienced instructors ($\chi^2=17.017$, $\rho=0.002$, $\phi=0.322$)
- state that they had evidence that their graduates are teaching IL skills to PK-12 students ($\chi^2=15.505$, $\rho=0.050$, $\phi=0.307$).

In addition, these experienced educators did not indicate lack of time in the course as a barrier to teaching IL skills ($\chi^2=10.794$, $\rho=0.029$, $\phi=0.257$) or IL standards ($\chi^2=10.946$, $\rho=0.027$, $\phi=0.258$).

In terms of assessment tools, instructors with 11-20 years of experience were the most likely to state that they used a state, commercial, or locally developed objective

test to assess information literacy competency, while instructors with less than five years of experience were more likely to state that they required a demonstration of IL skills rather than objective tests or portfolios ($\chi^2=33.230$, $\rho=0.032$, $\phi=0.710$).

DISCUSSION

Do education faculties collaborate with academic librarians on information literacy issues?

With two-thirds of the respondents reporting that they have collaborated with a librarian on information literacy issues, the answer to this question is a qualified “yes.” Since the literature strongly suggests that collaborative efforts are highly effective in helping students become proficient in information literacy skills (Duke & Ward, 2009; McGuinness, 2006; Raspa & Ward, 2000), it is somewhat troubling that the remaining one-third of survey respondents indicated that they have not collaborated with an academic librarian.

It is interesting to note that instructors who have collaborated with a librarian are more likely to use AASL standards as a guide. This finding suggests that librarians may be key in introducing and explaining these standards to faculty. In addition, collaborative efforts may help instructors overcome one of the barriers to incorporating IL into their courses, namely, their own perceived lack of expertise in information literacy. It may be the case that once teacher educators have the opportunity to learn more about the librarian’s IL expertise, as an outcome of having worked together, they recognize and appreciate that expertise and are, therefore, comfortable asking the librarian to help provide IL instruction in their courses. This explanation

is one interpretation of the finding that teacher educators who have collaborated with a librarian are more likely to have a librarian provide instruction in information literacy skills to their students.

Aspects of the collaboration process also may lessen the barrier of teacher educators' lack of IL expertise. By not having a clear understanding of information literacy standards, some instructors may not know how to embed information literacy effectively into assignments or course discussions. Librarians, on the other hand, are experts in these skills and, through the dialogue, exploration, and listening that occurs in collaboration (Raspa & Ward, 2000), librarians may be able to suggest changes or modifications to assignments that will effectively require students to use IL skills (Cook, 2000). Since those educators who have collaborated with a librarian were more likely to have altered or modified an assignment to increase student knowledge of IL skills, a possible connection between collaboration and a lowering of the barrier of lack of IL expertise may warrant further investigation.

The existence of collaboration between librarians and faculty may also suggest institutional support for these collaborative efforts since where collaboration has occurred, lack of external support to integrate information literacy is not likely to be identified as a barrier. Additionally, survey respondents who have collaborated were more likely to indicate that their school has information literacy competencies that must be satisfied for graduation and that there is an assessment tool to measure these competencies. These findings suggest that information literacy may be an institutional goal, rather than only a goal of a teacher education program.

What knowledge do education faculties have about information literacy standards?

Based on survey results, it is clear that the majority of teacher education faculties are aware of two aspects related to information literacy standards. First, most education faculty members know that information literacy standards exist for their students. That is, they know that pre-service teachers need to be information literate when they are graduated. Second, teacher education faculties know that information literacy standards exist for PK-12 students and, therefore, that their graduates will need to teach to those standards. One possible outcome of teacher educators having this knowledge is an expectation that information and appropriate pedagogy for PK-16 information literacy standards would be included in all teacher education programs. Despite the fact that the majority of teacher education programs do include some aspect of IL, survey results indicate that a significant number of programs do not require their pre-service teachers to include IL standards in the lesson plans these students create. Thus, there appears to be a lack of connection between the two layers of IL instruction for future teachers. On one hand, teacher education programs may be incorporating instruction to help their students be information literate themselves; however, these programs may not be doing enough to help their students learn pedagogy related to how to teach information literacy.

And while a vast majority of teacher educators (almost 80%) indicated that students in teacher education programs receive instruction in information literacy skills, it is not evident that these educators have a clear understanding of the exact definition of information literacy since

almost half of the respondents indicated they use ISTE standards rather than ACRL or AASL standards. Even though the ISTE standards incorporate aspects of information literacy, especially in the area of “Research and Information Fluency,” the ISTE standards are more focused on technology concepts, skills, and integration. The survey instrument did not probe respondents for in-depth information about their understanding of specific standards used for information literacy, and, coupled with the low use of ACRL (6%) and AASL (9%) standards for information literacy, it is impossible to ascertain how respondents interpret and contextualize information literacy standards. However, the identification of ISTE standards does pose a concern that education faculties may not be using the most appropriate IL standards to guide their work. Also disturbing was the finding that some teacher educators at private institutions may not be using any IL standards in their teaching.

Years of teaching experience is a factor that appears to have an impact on the teaching of information literacy skills, as well as insuring that pre-service teachers are aware that information literacy standards exist for PK-12 students. Comfort and expertise with existing course content may make it easier for instructors with more years of teaching to be responsive to providing training in information literacy skills. Added years of teaching experience also may make it easier to incorporate new content since long experience with a course allows an instructor continually to streamline, modify,

and improve a course. This experience may be an explanation why teachers with more experience were less likely to cite lack of time as a barrier to teaching both IL skills and IL standards. These are important findings since librarians often target new faculty as those who will be most receptive to collaborating, when in fact this might not always be the case. It may be worthwhile to investigate further faculty–librarian collaborations within the context of years of teaching experience.

How do education faculties incorporate information literacy knowledge and skills in their courses?

THESE ARE IMPORTANT FINDINGS SINCE LIBRARIANS OFTEN TARGET NEW FACULTY AS THOSE WHO WILL BE MOST RECEPTIVE TO COLLABORATING, WHEN IN FACT THIS MIGHT NOT ALWAYS BE THE CASE.

Echoing the literature, survey results indicate that IL skills and IL standards are incorporated into teacher education programs using a variety of methods including collaboration with a librarian, online

tutorials, librarian-taught sessions, and common, required courses. Teacher educators indicated that they have added new assignments, modified existing assignments, added a lecture or discussion, or added test items to deal with information literacy.

What barriers do education faculties encounter when trying to integrate information literacy into their courses?

It makes sense that barriers remained consistent whether educators were trying to integrate IL skills or IL standards. Since

most courses consist of well-established content, it is not surprising that lack of time and lack of their own expertise in IL were identified as major hurdles. These responses highlight another possible benefit of collaboration; a librarian, looking at a course from a different perspective, may be able to suggest ways that existing content and assignments can be slightly modified to include important IL skills and knowledge.

Are information literacy competencies assessed for pre-service teachers?

In the area of assessment of information literacy competencies, although forty percent of respondents indicated that there is some type of assessment of IL at their respective institutions, it was not clear exactly what is assessed since the most common assessment tool mentioned was the portfolio, and portfolios can cover a wide range of content. And, with sixty percent of the respondents indicating that their institution did not have an assessment for IL skills, or that they were unable to answer the question, further investigation into the specifics of the assessment of IL competencies is warranted.

LIMITATIONS OF THE STUDY

Admittedly, survey results were received from a small number of education faculty members nationwide. In part this was due to the fact that the researchers relied on administrators to forward the online survey to appropriate faculty. There was no way to determine how often this was actually done and/or to know the number of education faculty the survey reached. Better follow-up may have improved the response rate.

A few of the survey items could have been posed differently or accompanied by

additional context. Question 7 (What are the specific information literacy skills that you include in your teaching?) provided respondents with five options as well as an opportunity for them to provide additional information. Two of the choices, Internet searching and evaluation of sources were not defined, and this left the response open to interpretation by those answering the question.

Based on the authors' own experience at a large public university, education faculty awareness of institutional efforts to train students in IL skills might not have reflected the actual programs in place at their institutions. In other words, a "no" answer to Question 2 (Does your institution provide training in information literacy skills for students?) may or may not have been accurate depending on the respondent's knowledge of campus IL efforts.

CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

This survey provides evidence that teacher education faculties are, for the most part, knowledgeable about information literacy standards and many have actively worked to incorporate information literacy into their teacher education programs. Many of these faculty members have also collaborated with academic librarians in order to address information literacy better. Further, survey results indicate that the majority of pre-service teachers are receiving instruction in the essential information literacy skills of Internet searching, identifying appropriate sources, evaluating resources, using electronic databases, and formulating search strategies.

Somewhat troubling are results that indicate there is minimal use of ACRL and AASL

standards for information literacy, and, in some institutions, there may be no IL instruction in teacher education courses. Other areas of concern surfaced because fewer than half of the respondents require IL standards to be part of lesson plans that pre-service teachers create and fewer than half of the respondents indicated that IL competencies are a requirement for graduation. Thus, if pre-service teachers are not including IL in their lesson plans and are not acquiring IL skills as a requirement for graduation, they may not be equipped to deal effectively with IL needs in PK-12 classrooms. One area that needs further investigation is the teaching of IL skills in PK-12 classrooms, since survey results provided little concrete evidence that teacher education graduates are teaching information literacy to their PK-12 students. It may be valuable to determine, for instance, strategies that could be used for tracking how PK-12 teachers introduce IL into their lesson plans after graduation.

The assessment of information literacy skills is another concern because only forty percent of respondents indicated that their institution has an assessment tool for IL. If the majority of teacher education programs do not assess information literacy skills, then there is little those programs can do to measure and monitor student growth in IL and to know if their graduates are equipped with the knowledge and skills not only to model information literate behaviors, but also to teach information literacy skills to PK-12 students. The popularity of using a portfolio as a culminating assessment tool has promise in the area of assessment of IL skills, but only if the evaluation criterion for the portfolio requires students to provide evidence of specific IL-related competencies.

Both librarians and teacher education

faculties have a responsibility to seek each other out to begin or enhance their collaborative efforts. Strategies to encourage collaboration may include the establishment of mentoring relationships between librarians and teacher educators, the joint development of model lesson plans that incorporate IL skills that teacher educators could use as examples with their students, the initiation or expansion of librarian-presented IL sessions for faculty, or simply inviting a colleague to lunch to talk about information literacy.

While progress is being made in incorporating information literacy into teacher education programs (Duke & Ward, 2009), much still needs to be done. As evidenced by many successful collaborations, both teacher educators and academic librarians benefit from working together to prepare future educators to be information literate and to have the pedagogical knowledge needed to teach their future students these skills as well.

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