Preparing Information Literate Teachers:

A Review of the Literature

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Abstract

An academic librarian and teacher educator at a university in Alaska reviewed 39 journal articles

and book chapters that examine issues related to the preparation of information literate teachers

in the U.S., Canada, Australia, New Zealand, Mexico, and the U.K. We classified each item by

national origin, disciplinary perspective, intended audience, and publication type (e.g., empirical

study, descriptive work, position paper, guide, annotated bibliography). Ten of the items were

empirical studies. We classified each study by research design (e.g., case study, quasi-

experimental group design, mixed methods research), we identified the participants and data

sources, and we summarized the findings. We then subjected all 39 items to a phenomenological

method of data analysis. Five themes emerged from our analysis of this body of literature: (a)

information literacy, education, and democracy; (b) information literacy pedagogy; (c)

collaboration; (d) information literacy and technology; and (e) information literacy standards.

Finally, we connected these "emergent themes" to our respective roles as a teacher educator and

academic librarian, and we reflected on our collaborative efforts to prepare information literate

teachers for Alaska's schools.

The Problem

The term *information literacy* was first used by Paul Zurkowski, the President of the Information Industry Association, in a 1974 proposal he submitted to the National Commission on Libraries and Information Science (Maughan, 2001). In 1987, American Library Association (ALA) President Margaret Chisholm appointed the ALA Presidential Committee on Information Literacy and charged it with defining information literacy and determining its "importance to student performance, lifelong learning, and active citizenship" (p. 15). The committee's final report, issued in 1989, defined information literacy as the ability to "recognize when information is needed" and to "locate, [critically] evaluate, and [effectively] use" information from a wide variety of sources (p. 1). The report described information literate people as individuals who are "prepared for lifelong learning" because they "have learned how to learn … they know how knowledge is organized, how to find information, and how to use information" (p. 1). The committee described information literacy as a means to social, political, and economic empowerment and suggested that information literacy is "central to the practice of democracy" in the 21st century because citizens who live in democratic societies must be able to locate and critically evaluate information if they are to effectively participate in the social, political, and economic decision-making processes that impact their lives and communities (p. 5).

The ALA Presidential Committee on Information Literacy (1989) recognized that U.S. public school teachers must be information literate if they are to prepare their K-12 students "for a lifetime of learning" in this "Information Age" and empower these learners to effectively participate in the democratic process (p. 1). The committee also recognized that K-12 students in U.S. public schools are all too often passive consumers of ready-made information and suggested

that inquiry-based approaches to teaching and learning would better promote the development of the critical thinking abilities and problem-solving skills that these learners will need if they are to succeed in the 21st century economy. The committee, therefore, recommended that teacher education programs adopt information literacy performance standards and modify program requirements so that teachers become facilitators of knowledge construction (and not simply presenters of ready-made information). The committee further recommended that teacher education programs prepare teachers to integrate the concept of information literacy into the K-12 curriculum and adopt inquiry-based approaches to teaching and learning that utilize the "information resources of the real world" (p. 7).

One year before the ALA Presidential Committee on Information Literacy (1989) issued its' final report (and defined and popularized the term *information literacy* for librarians and educators), O'Hanlon (1988) examined a body of literature that described "continuing efforts [by academic librarians] to promote library instruction in teacher education programs" (p. 528). O'Hanlon conducted an historical analysis of articles and documents related to the preparation of "library-literate" K-12 teachers in the U.S. published between 1904 and 1987. She found that "[academic] librarians have attempted to convince [teacher] educators of the value of bibliographic instruction for more than eighty years, without much success" (p. 532). O'Hanlon suggested that "library-literate teachers, working cooperatively with school library personnel, could ensure successful [resource-based] instructional programs" that simultaneously strengthened K-12 students' library research skills and critical thinking and problem-solving abilities (p. 528).

In 1998, the Association of College and Research Libraries (ACRL) issued *A Progress Report on Information Literacy.* This report updated the 1989 findings of the ALA Presidential

Committee on Information Literacy and described progress made toward implementing the committee's recommendations. Disappointingly, the ACRL reported that teacher education programs in the U.S. had made no progress in modifying course requirements and performance expectations to address information literacy concerns. The ACRL recommended that the ALA and its partners "develop a plan for working with teacher education programs and the National Council for Accreditation of Teacher Education [NCATE] to infuse information literacy requirements into undergraduate and graduate programs of teacher education" (http://www.ala.org/ala/acrl/acrlpubs/whitepapers/progressreport.cfm, April 21, 2008).

Five years after the ACRL (1998) issued *A Progress Report on Information Literacy,* Johnson and O'English (2003) developed an annotated bibliography on the topic of information literacy in teacher education. Johnson and O'English summarized 24 articles published between 1987 and 2002. They found that many of the articles included in their annotated bibliography outlined "concerns about pre-service teachers who graduate with insufficient information literacy skills, who are unprepared to teach these skills to their future students, and who do not understand the role of the school librarian as an instructional collaborator." On a more positive note, Johnson and O'English found that numerous articles described "successful and innovative programs where exposure to librarians, integration of information literacy instruction" and "attention to library research … can produce new [information literate] teachers who are equipped to collaborate with school librarians and teach information literacy [and research] skills to their students" (p. 129).

The Authors' Experiences and Beliefs

Merriam (1988) recommended that researchers clarify their biases from the outset of their studies by commenting on any experiences and beliefs that have likely shaped their

interpretations of and approaches to their research topics. The co-authors of this review of the literature (Thomas and Jennifer) agree with Merriam and wish to provide the reader with some information about our respective experiences with and beliefs about information literacy and teacher education.

One author (Thomas) is an associate professor of education at a state university in Alaska where he coordinates graduate and undergraduate programs in special education and teaches courses in special education and educational research. The other author (Jennifer) is an assistant professor of library science and an outreach services librarian at this same university, where her main responsibility is to support distance-delivered education.

Our university recently began offering a distance-delivered Master of Education (M.Ed.) in Special Education degree program. This relatively new program prepares teachers who live and work in Alaska's remote, rural, and Alaska Native communities to develop and deliver culturally responsive instructional services to students with disabilities. All courses are delivered via teleconference and augmented with online resources. In the summer semester of 2007, the M.Ed. in Special Education program admitted our first cohort of 30 special education teacher candidates. Some of our candidates live and work in Alaska's urban communities (e.g., Anchorage, Fairbanks, or Juneau); most, however, teach school in one of the more than 200 geographically isolated and sparsely populated communities that are scattered across Alaska's vast terrain. Our candidates are often the only special education teachers in their respective villages, and many of our candidates provide instructional services to students with a wide range of exceptional learning needs and developmental levels. One of our candidates – Judy – teaches school in a geographically isolated community of approximately 300 people. There are no roads leading into or out of her village. For most of the year, the only way to reach Judy's village is by

chartered plane; in the winter months, when the river system is frozen solid, the village is also accessible by snow machine. Judy, who is one of only five certified teachers in her village – and the *only* special educator – provides instructional services to eleven students, including: a pre-school child with developmental delays; a second grader with a hearing impairment and speech and language delays; a medically fragile fourth grader who uses a wheelchair; a fifth grader with a reading disability; another fifth grader with attention deficit hyperactivity disorder (ADHD); three middle school students with specific learning disabilities; an eighth grader with fetal alcohol spectrum disorder and severe behavior problems; a sophomore with autism; a nineteen year old with Down syndrome; and a twenty year old with traumatic brain injury. Judy's situation is not unique – many of the teachers in our program are confronted with equally challenging caseloads.

No single special educator can be expected to possess highly specialized knowledge about such a daunting array of exceptionalities and developmental levels; even a bright, capable, and highly motivated special education teacher – like Judy – is unlikely to become a specialist in early childhood intervention, hearing impairments, communication disorders, orthopedic disabilities, health impairments, specific learning disabilities, ADHD, emotional and behavioral disorders, autism, intellectual impairments, and traumatic brain injury. And no teacher education program can adequately prepare an individual special educator to *specialize* in such a vast array of exceptionalities and developmental levels. What we, as a distance-delivered teacher education program, *can* do, however, is prepare *information literate* special education teachers who recognize when they need highly specialized information about particular exceptionalities and developmental levels, and are able to locate, critically evaluate, and effectively use such information to benefit their students. What we *can* do, in other words, is teach candidates who

live and work in sparsely populated, geographically isolated communities the *research strategies* that they will need to locate, evaluate, and use highly specialized information about exceptionalities from a variety of electronic resources.

In the first year of their program, our candidates are immersed in the philosophical, historical, legal, theoretical, and pedagogical issues that form the foundations of special education practice; in the second year of their program, our students are immersed in the development of information literacy skills and research strategies. In 2008, Thomas (the special education coordinator) invited Jennifer (the academic librarian) to co-develop and co-teach three research methods courses to our M.Ed. in Special Education candidates; these three courses included: ED 626 (Classroom Research); EDSE 692 (Secondary Research Methods); and EDSE 698 (Master's Thesis Project). Most of our candidates take these three research courses in their second year of study. In ED 626 (Classroom Research), our candidates conduct a phenomenological self-study in which they systematically examine their work as special education teachers. In EDSE 692 (Secondary Research Methods), our candidates learn to systematically collect and analyze secondary data sources related to the field of special education. In EDSE 698 (Master's Thesis Project), our candidates conduct a meta-analysis of topics relevant to their current teaching assignments and use what they have learned from their meta-analyses to strengthen their instructional practices.

For the past several years, we (Thomas and Jennifer) have co-taught ED 626 (Classroom Research) to teacher candidates enrolled in our university's graduate programs in Elementary Education, Early Childhood Education, Math Education, Educational Technology, and Reading. As previously noted, all candidates in ED 626 are required to conduct phenomenological self-studies. In order to better teach our graduate students to conduct such studies, *we* conducted, and

eventually published, a phenomenology titled *Librarian and Faculty Collaborative Instruction: A Phenomenological Self-Study* (Brown & Duke, 2005). Our interest in and commitment to information literacy, teacher education, and librarian and faculty collaboration led us to co-author a second publication titled *Teacher as Researcher: Librarian and Faculty Collaboration in Teaching the Literature Review in a Distance-Delivered Teacher Education Program* (Duke & Brown, 2006). As we prepared to teach EDSE 692 (Secondary Research Methods) in the fall semester of 2008, we reviewed of the literature on information literacy and teacher education; we hope to use what we have learned from conducting this review of the literature to help our M.Ed. in Special Education candidates strengthen their information literacy skills and research strategies. We also intend to offer this review of the literature to our M.Ed. in Special Education candidates so they can use it as template as they conduct their *own* reviews of the special education literature in ED 626, EDSE 692, and EDSE 698.

The Purposes of this Review of the Literature

This review of the literature had multiple purposes. One purpose was to identify journal articles and book chapters that examined issues related to the preparation of information literate teachers in the U.S. (and in other nations, including Australia, Canada, Mexico, New Zealand, Taiwan, and the U.K.). A second purpose was to classify these articles and chapters according to national origin, disciplinary perspective, intended audience, and publication type. The third purpose was to locate empirical studies that examined information literacy in teacher education contexts, and to describe the participants, research design, data sources, and findings of each study. Our fourth purpose in conducting this review was to use a phenomenological method of data analysis to develop "emergent themes" that described the "essence" (or content) of the entire body of literature (Creswell, 2007). Our fifth and final purpose was to connect these

"emergent themes" to our respective roles as a teacher educator and academic librarian, and our collaborative efforts to prepare information literate teachers for Alaska's schools.

Methods

Selection Criteria

The journal articles and book chapters included in this review of the literature met the following selection criteria:

1. The articles and chapters addressed issues related to information literacy in teacher education contexts;

2. The articles were published in peer-reviewed journals typically read by academic librarians and/or teacher educators;

3. The chapters were authored by academic librarians and/or teacher educators (or by educational research consultants with strong backgrounds in K-12 education) and published in scholarly texts that examined issues related to information literacy pedagogy;

4. The articles and chapters were published between March 1998 (when the ACRL issued *A Progress Report on Information Literacy*) and 2008; and

5. The articles and chapters were written in English.

Search Procedures

We conducted database searches, hand searches, and an ancestral search to locate journal articles and book chapters for this review of the literature. We located 39 articles and chapters that met our selection criteria. The discrepancy between the actual number of items included in this review (39) and the combined number of items located in the various searches (48) is due to redundant finds.

Database Searches

We searched eight databases that index literature related to teacher education and/or library and information science to locate journal articles for this review of the literature. These eight databases included: (a) ERIC (Ebscohost); (b) Education Journals (ProQuest); (c) Wilson Education Abstracts (ProQuest); (d) Professional Development Collection (Ebscohost); (e) Academic Search Premier (Ebscohost); (f) Library Literature (OCLC Firstsearch); (g) Science Direct (University of Alaska Collection); and (h) Library Information Science and Technology Abstracts (LISTA Ebscohost). When databases had a controlled vocabulary, we conducted the search with its designated subject terms, usually "information literacy" or "library instruction" and "teacher education" or "teachers – training of." When a database did not have a controlled vocabulary, we conducted the search using the search terms "information literacy" and "teacher education" as keyword phrases limited to the title, citation, and abstract of the article record. Our specific search procedures for each database are described to follow.

ERIC (Ebscohost). A Boolean search using the subject descriptors ("information literacy" OR "library instruction") AND ("teacher education") limited to the publication type "journal articles" and the educational level "higher education" returned 19 results. Six of these results met our selection criteria and were included in this review of the literature (Beile & Boote, 2002; Braun, 2003; Dennis, 2001; Lau, 2001; Orr & Cribb, 2003; Toifel & Franklin, 1998).

Education Journals and Wilson Education Abstracts (ProQuest). We conducted a Boolean search for the terms ("information literacy" OR "library instruction") AND ("teacher education" OR "teacher education programs") in the citations and abstracts of the combined data sets of the Education Journals and Wilson Education Abstracts database collections. This search returned 30 articles published in scholarly journals. Some of these articles were duplicated because we searched two databases with overlapping content simultaneously. Ten of the articles

met our selection criteria and were included in this review of the literature (Asselin, 2004;

Asselin & Lee, 2002; Crouse & Kasbohm, 2004; Henderson & Scheffler, 2003; Loveless, 2000;

Manathunga, 2002; McPherson, Wang, Hsu, & Tsuei, 2007; Moore, 2006; Schloman & Gedeon,

2007; Wang, 2007).

Professional Development Collection (Ebscohost). Using the controlled vocabulary of this

database, we conducted a Boolean search for the subject terms ("teachers – training of" AND

"information literacy") within the subject field. This search returned four results, three of which

met our selection criteria and were included in this review of the literature (Dutt-Doner, Allen, &

Corcoran, 2005; Torres & Mercado, 2007; Williams & Coles, 2007).

Academic Search Premier (Ebscohost). In order to cast a wider net in this

multidisciplinary database, we exploded the subject term "information literacy" to include

related terms. We conducted a Boolean search for subject ("information literacy" OR "electronic

information resource literacy" OR "internet literacy" OR "media literacy") AND subject

("teachers – training of"). This search returned six results that met our selection criteria (Asselin

& Doiron, 2003; Bhavnagri & Bielat, 2005; Dutt-Doner et al., 2005; Johnson & O'English;

Williams & Coles, 2007 Witt & Dickinson, 2005).

Library Literature (OCLC Firstsearch). A Boolean search on ("information literacy" OR

"library instruction") AND ("teacher education" OR "teacher training") as keywords returned

four results. Two of these articles met our selection criteria and were included in this review of

the literature (Davis-Kahl & Payne, 2003; Johnson & O'English, 2003).

Science Direct (University of Alaska Collection). A search for "information literacy"

AND "teacher education" in all sources returned one article that met our selection criteria

(Floyd, Colvin, & Bodur, 2008).

Library Information Science and Technology Abstracts (LISTA Ebscohost). A search for

the terms ("information literacy") as subject AND ("teachers" OR "teacher education" OR

"teacher training") AND ("higher education") as keywords returned 17 articles published in

academic journals. Only one of these17 articles met our selection criteria (Witt & Dickinson,

2003). We then launched a search for the subject ("LIBRARIAN – teacher cooperation") OR

("STUDENT teachers – training of"). This search returned 28 articles published in academic

journals, but only one of these articles met our selection criteria (Floyd et al., 2008).

Hand Searches

We conducted hand searches of three books that examined issues related to information

literacy pedagogy to locate chapters that met our selection criteria. Seven chapters from

Teaching Information Literacy Skills to Social Sciences Students and Practitioners, edited by

Cook and Cooper, met our selection criteria and were included in this review of the literature

(Ariew, 2006; Bielat & Bhavnagri, 2006; Childers & Renne, 2006; Duke & Brown, 2006;

Laverty & Reed, 2006; Smith, 2006; Warner & Templeton, 2006). Six chapters from *Information*

Literacy Instruction for Educators: Professional Knowledge for an Information Age, edited by

Shinew and Walter, met our selection criteria and were included in this review (Asselin &

Doiron, 2003; Branch, 2003; Hinchliffe, 2003; Johnson & O'English, 2003; Lipu, 2003; Witt &

Dickinson, 2003); it should be noted that all six of these chapters were co-published

simultaneously as journal articles in a special issue of *Behavioral & Social Sciences Librarian.*

One chapter from *Leadership Issues in the Information Literate School Community,* edited by

Henri and Asselin, met our selection criteria and was included in this review of the literature

(Asselin, 2005).

Ancestral Search

An ancestral search involves reviewing the reference list of previous publications to locate literature relevant to one's topic of interest. We located an annotated bibliography that addressed the topic of information literacy in teacher education (Johnson & O'English, 2003). An ancestral search of this annotated bibliography located three articles that met our selection criteria (Asselin, 2000; Asselin & Lee, 2002; Small, 2002).

Browsing

We located one additional article that met our selection criteria while browsing through an issue of *The Australian Library Journal* (Hobbs & Aspland, 2003); we included this article in our review of the literature.

Coding Procedures

We developed a coding form to categorize the information presented in each of the 39 articles and chapters. This coding form was based on: (a) national origin; (b) disciplinary perspective; (c) intended audience; (d) publication type; (e) research design; (f) participants; (g) data sources; and (h) findings.

National Origin

We classified each article and chapter by national origin. Our original intent was to only review articles and chapters that described the preparation of information literate teachers in the U.S. However, as we searched the databases to collect literature for this review, we came across numerous items that described the efforts of academic librarians and teacher educators who had successfully infused information literacy concepts into teacher education programs at universities in Australia, Canada, Mexico, Taiwan, and the U.S. We also located articles that described issues relevant to the preparation of information literate teachers in New Zealand and the U.K. We believe that academic librarians and teacher educators in the U.S. have much to learn from their

colleagues in other countries (just as academic librarians and teacher educators in the other countries have much to learn from their colleagues in the U.S.). We, therefore, decided to expand our selection criteria and include articles and chapters written by academic librarians and teacher educators from Australia, Canada, Mexico, New Zealand, Taiwan, the U.K., and the U.S. in this review of the literature.

Disciplinary Perspectives

We classified each article and chapter according to the disciplinary perspective of its author or co-authors. We wanted to know how many of the items were written by academic librarians, how many were written by teacher educators, and how many were co-authored by academic librarians and teacher educators. Most of the authors included in this review identified their disciplinary perspectives and/or professional affiliations for the reader. When an author's disciplinary perspective and professional affiliation was *not* identified in an article or chapter, we used the Google search engine to locate this information.

Intended Audience

All of the articles and chapters included in this review were published in journals or books that explicitly identified the disciplinary perspectives and professional affiliations of their intended audience. We classified each item according to the intended audience of the source in which it was published. We wanted to know how many of the items were published in sources intended for academic and school librarians, how many were published in sources intended for teacher educators, and how many were published in sources intended for both audiences.

Publication Type

We evaluated and classified each article according to *publication type* (e.g., empirical study, descriptive article, position paper, guide, annotated bibliography). *Empirical studies*

explicitly delineate the methods used to gather and analyze quantitative and/or qualitative data. *Descriptive works* describe experiences and phenomena but do *not* explicitly delineate methods to gather and analyze data. *Position papers* explain (and *advocate* for) particular policy positions, philosophical perspectives, theoretical frameworks, and/or educational models. *Guides* recommend specific strategies and/or explain how practitioners might *implement* particular curricula, programs, or models. An *annotated bibliography* is a list of books, articles, or other documents about a particular topic containing a citation of each item followed by a brief description and/or a critical evaluation of it.

Many of the articles and chapters included in this review had characteristics of two or more publication types. When this was the case, we attempted to determine the authors' primary purpose in writing the article or chapter and then classified the publication accordingly. An article by Moore (2006), for example, had characteristics of a position paper, an empirical study, and a descriptive work. Moore explained the relational model of information literacy developed by Christine Bruce (1997) and used Bruce's model as a theoretical framework for examining national curriculum documents related to information literacy in the New Zealand education sector. Moore *did* identify her data sources (i.e., "national curriculum documents") and we *assume* that she used Bruce's framework to subject these documents to an empirical analysis; however, Moore did *not* explicitly delineate the methods she used to gather and analyze these documents. We decided that Moore's *primary purpose* in writing her article was to describe "national policies, teacher education, curriculum integration, and assessment issues relating to information literacy and lifelong learning" in New Zealand (p. 1); we, therefore, classified Moore's article as a descriptive work.

A chapter by Bielat and Bhavnagri (2006), to cite another example of a publication with

the characteristics of multiple publication types, has characteristics of a descriptive work, a position paper, and a guide. Bielat and Bhavnagri described the efforts of an academic librarian and teacher educator who collaborated "to fully integrate library instruction into an existing master's-level teacher education course" (p. 116). These authors also explained constructivist concepts pioneered by the Russian developmental psychologist Lev Vygotsky (e.g., "scaffolding," the "Zone of Proximal Development," and the "co-construction of knowledge") and described the benefits of using Vygotsky's work as a theoretical framework to develop, implement, and evaluate a series of collaborative and inquiry-based teaching and learning experiences. However, it seemed to us that the authors' *primary* purpose in writing their chapter was to explain specific instructional strategies and share a particular lesson plan and evaluation rubric with other academic librarians and teacher educators. We, therefore, classified Bielat and Bhavnagri's chapter as a guide.

Research Design, Participants, and Data Sources

We classified each study according to its *research design* (i.e., quantitative research, qualitative research, and mixed methods research); we identified the *participants* in each of the studies (e.g., academic librarians, teacher educators, pre-service and in-service teachers); and we identified the *data sources* used in each study (e.g., interviews, surveys, questionnaires, pre-and-post measures).

Quantitative research involves the collection and analysis of numerical data. *Qualitative* research involves the generation and analysis of data that is expressed through language. *Mixed methods* research involves the collection and analysis of both quantitative and qualitative data (Creswell, 2007; Gall, Gall, & Borg, 2006).

Gall et al. (2006) identified four approaches to quantitative research: experimental, quasi-

experimental, descriptive, and correlational. Three of these approaches (quasi-experimental, descriptive, and correlational) are represented in this review of the literature. Researchers who conduct *experimental* and *quasi-experimental* studies seek to determine cause and effect relationships, often by comparing pre-and-post measures collected from individuals assigned to experimental and control groups; individuals who participate in true experimental studies are *always* selected at random while individuals who participate in quasi-experimental studies are usually *not* selected at random. *Descriptive* research is used to describe the distribution of a variable throughout a given population, most often through the use of surveys and questionnaires; there is no manipulation of variables in descriptive research and no attempt to establish cause and affect relationships. *Correlational* research is used to identify, clarify, or emphasize relationships between two or more variables but does not determine cause and effect; the correlation co-efficient is a mathematical expression of the relationship that exists between the variables; surveys and questionnaires are often used to gather data.

Creswell (2007) identified five approaches to qualitative inquiry: case study, narrative research (i.e., biography), phenomenology, ethnography; and grounded theory research. Only one of these approaches – case study – is represented in this review of the literature. Case studies explore "bounded systems" (i.e., cases) "over time through detailed, in-depth data collection involving multiple sources of information" (p. 73). The case is bounded by place (e.g., a university classroom, a university library, an online learning community) and time (e.g., a single lesson, a semester, an academic year). Multiple sources of information might include interviews, observations, audiovisual materials, documents, and other artifacts relevant to the case. The researcher attempts to position the case within a particular context. This context might be conceptualized quite broadly (e.g., historical, cultural, and sociopolitical contexts) or more

narrowly (e.g., teacher education, librarian-faculty collaborative instruction, web-based learning).

Data Analysis / "Emergent Themes"

The Stevick-Collaizi-Keen method is a highly reductive method of data analysis frequently used by researchers working within the phenomenological tradition of qualitative inquiry to systematically distill essential concepts, issues, and themes from text (Creswell, 2007). We located 39 articles and chapters that met our selection criteria. We then used a modified version of the Stevick-Collaizi-Keen method previously employed by Brown and Duke (2005), Duke (2007), and McCarthy and Duke (2006) to analyze the 39 articles and chapters included in this review. We first identified "significant statements" within each article or chapter. For the purpose of this study, we defined a "significant statement" as any statement that explicitly described issues relevant to the preparation of information literate teachers. We then developed a list of non-repetitive, non-overlapping (verbatim) "significant statements" with (non-verbatim) "formulated meanings." These "formulated meanings" represented our interpretation of each "significant statement." Finally, we grouped the "formulated meanings" from all 39 articles and chapters into collective "theme clusters" (or "emergent themes"). These "emergent themes" represent the "essence" (or content) of the entire body of literature (Creswell, 2007).

Results

The national origin, disciplinary perspective, intended audience, and publication type of each article and chapter are delineated in Table 1.

Insert Table 1

National Origin

Twenty-four of the 39 items (62 %) included in this review of the literature examined issues related to the preparation of information literate teachers in the U.S. Seven of the items (20 %) explored issues related to the preparation of information literate teachers in Canada. Four items (10 %) described teacher education programs in Australia. Two articles (5 %) addressed issues related to the preparation of information literate teachers in the U.K. One article (3 %) described collaboration between academic librarians and teacher educators at a university in Mexico. One article (3 %) discussed issues related to the preparation of information literate teachers in New Zealand. One article (3 %) described a collaborative web-based project involving in-service teachers in the U.S. and Taiwan.

Disciplinary Perspectives

Nineteen of the 39 items (49 %) included in this review of the literature were written by academic librarians. Twelve of the items (31 %) were co-authored by academic librarians and teacher educators or written by individuals with expertise and professional experience in both disciplines. Eight of the items (21 %) were written by teacher educators or educational research consultants with strong backgrounds in K-12 education.

Intended Audience

Twenty-two of the 39 items (56 %) included in this review of the literature were published in journals or books intended for librarians. Ten of the articles (26 %) were published in journals intended for teacher educators. Eight of the items (21 %) were co-published simultaneously in journals intended for academic librarians and/or teacher educators and books intended for both audiences.

Publication Type

Thirteen of the 39 items (33 %) included in this review of the literature were descriptive works. Eleven of the items (28 %) were guides. Ten items (26 %) were empirical studies. Four items (10 %) were position papers. One item (3 %) was an annotated bibliography.

Empirical Studies

We located ten empirical studies that met our selection criteria. The research design, participants, data sources, and findings of each of these studies are delineated in Table 2.

Insert Table 2

Research Design

Four of the ten studies (40 %) included in this review of the literature employed quantitative methods to collect and analyze data. Two of these were correlational studies; one was a quasi-experimental study; and one was a descriptive study. Two of the empirical studies (20 %) included in this review used qualitative methods to generate and analyze data; both were case studies. Four of the empirical studies (40 %) included in this review employed mixed methods approaches to gather and analyze data.

Participants and Data Sources

Nine of the ten studies (90 %) included in this review of the literature analyzed *primary* data collected from human subjects. Three of these studies employed pre-and-post measures to gather data from pre-service teachers. Three studies used interviews, surveys, and/or questionnaires to gather information from pre-service teachers; one study employed interviews and surveys to collect data from in-service teachers; another study used interviews and surveys to gather information from academic librarians and teacher educators. Dutt-Doner et al. (2007) identified the individuals who participated in their case study (i.e., pre-service teachers) – so we

can assume that primary data *was* collected and analyzed – but these authors did *not* identify specific data sources. Manathunga (2002) analyzed *secondary* data sources, but did not collect primary data from human subjects.

Findings

The findings of the ten studies included in this review of the literature can be summarized as follows:

1. Pre-service and in-service teachers often lack adequate information literacy skills; many teachers are unable locate, critically evaluate, and effectively use educational research that might strengthen their instructional practices; many teachers are unprepared to teach information literacy concepts and research strategies to their own K-12 students.

2. Effective library instruction can strengthen the information literacy skills of pre-service teachers; library instruction is most effective when it is integrated into education courses; collaborative instruction between academic librarians and teacher educators is particularly effective.

3. It is not enough to simply strengthen the information literacy skills of pre-service teachers; in order to prepare teachers to effectively integrate information literacy into the K-12 curriculum, teacher educators and academic librarians must model and teach *information literacy pedagogy*; teacher educators and academic librarians must also model and teach the collaboration necessary to support such integration.

"Emergent Themes"

As previously noted, we used a phenomenological method of data analysis to develop "theme clusters" that represent the "essence" (or content) of this entire body of literature (Creswell, 2007). Five broad themes emerged from our analysis of the 39 articles and chapters

included in this review. These "emergent themes" (or "theme clusters") include: (a) information literacy skills, education, and democracy; (b) information literacy pedagogy; (c) collaboration; (d) technology and information literacy; and (e) information literacy standards. These five "theme clusters" and their associated "formulated meanings" are delineated in Table 3.

Insert Table 3

Discussion

In this section, we summarize the major themes that emerged from our analysis of the 39 articles included in this review of the literature; we connect these "emergent themes" to our respective roles as a teacher educator and academic librarian; and we reflect on our collaborative efforts to prepare information literate teachers for Alaska's schools.

Theme 1: Information Literacy Skills, Education, and Democracy

Information literate teachers are able to search for, retrieve, and critically evaluate information that empowers their professional practice. In addition, teachers who possess, model, and teach the critical thinking and problem solving skills central to information literacy are better able to prepare their students for a lifetime of learning. The acquisition of information literacy skills should, therefore, be an integral part of any teacher education program. Unfortunately, many teachers graduate from teacher education programs with insufficient information literacy skills. Teachers must be information literate if they are to effectively prepare students to actively participate in the democratic process. Information literate citizens in democratic societies are empowered to participate in the social, political, and economic decision-making processes that impact their lives and communities; those citizens who *lack* information literacy skills often lack access to knowledge, power, and resources. Teachers who wish to encourage pluralism, promote social justice, and protect and strengthen democratic institutions in this Information Age must

learn to recognize propaganda and special interests in the mass media – and in a variety of other information resources, including textbooks and curricular materials – and they must teach their students to do the same.

Thomas: I earned two advanced degrees in education – but never once received *any* library instruction. Information literacy was not addressed in my Master's degree program (which prepared me to be a special education teacher), nor was it embedded in my doctoral program (which prepared me to be a teacher educator and educational researcher). I taught myself to use the ERIC database when I wrote the review of the literature for my doctoral dissertation, but I did not learn to efficiently and systematically search the ERIC database until I began co-teaching courses with Jennifer. In so many ways, I believe I received an excellent education in my doctoral program – I learned a great deal about the philosophical and theoretical foundations of social science research, and I was taught to systematically gather and analyze primary data – but one real area of weakness in my program of study was the total *absence* of information literacy instruction. I was never taught to systematically collect *secondary* data sources. The acquisition of information literacy skills just wasn't on the radar screen in either one of my graduate programs. I find that my *lack* of experience with information literacy instruction is typical of most other educators' – whether they be K-12 teachers or university-based teacher educators.

When I designed the M.Ed. in Special Education program at our university, I wanted to make sure that our teacher candidates graduated with strong information literacy skills; that's why I embedded information literacy instruction in ED 626 (Classroom Research), EDSE 692 (Secondary Research Methods), and EDSE 698 (Master's Thesis Project) – the three courses that constitute our candidate's second year of study – and that's why I invited Jennifer (an academic

librarian) to co-develop and co-teach these three courses. Jennifer and I teach our candidates to locate, critically evaluate, and effectively use educational research that might benefit their K-12 students. I also want our candidates to critically evaluate information presented in textbooks and other curricular materials. So many of our candidates teach in Alaska Native communities; yet, the textbooks and curricular materials adopted by local school districts most often reflect the values and beliefs of the dominant European American culture. Our candidates teach students with disabilities, but many textbooks all but ignore disability culture and the contributions and experiences of people with disabilities. I want our candidates to have the information literacy skills necessary to locate and critically evaluate information resources that represent and affirm the life experiences and contributions of Alaska Natives, individuals with disabilities, and other historically oppressed peoples, and I want our candidates to effectively use these information resources as *alternative* curricular materials.

Jennifer: Empowering individuals to think critically and understand their rights and their ability to make decisions in their own lives and for the benefit of others in our society is the number one reason I pursued a career in academic librarianship. It is encouraging to see that the connection between information literacy, education, and democracy is a major theme in this body of literature. This is an issue that I need to address more specifically with our graduate students in ED 626 (Classroom Research), EDSE 692 (Secondary Research Methods), and EDSE 698 (Master's Thesis Project). I think I should develop an assignment, or a tutorial, that focuses on how to recognize propaganda and special interests; such an assignment, if developed successfully, could be shared across our university's School of Education programs to reach teacher candidates beyond those I meet with directly in the three classes I co-teach with Thomas.

Theme 2: Information Literacy Pedagogy

All too often, teachers are merely presenters of ready-made information (rather than facilitators of knowledge construction), and their students are passive consumers of other people's ideas (rather than active participants in the co-construction of knowledge). Many teachers are not taught to teach information literacy concepts and research skills to their K-12 students. Teacher candidates need to be immersed in the research process, and information literacy and resource-based learning should be embedded throughout the teacher education curriculum. Successful and innovative teacher education programs employ, model, and teach constructivist approaches to information literacy pedagogy – e.g., these programs require teacher candidates to complete inquiry-based, authentic learning assignments that utilize real-world information resources – but such programs remain the exception, rather than the norm. Many university libraries offer information literacy instruction and support services to education faculty and teacher candidates; unfortunately, these services are often under-utilized. Pre-service teachers are not typically provided with opportunities to collaborate with school librarians, and information literacy concerns are rarely addressed in field experiences, internships, and student teaching experiences.

Jennifer: The distance-delivered nature of the teacher education programs at our university adds a further level of complexity to the problem of information literacy pedagogy and the under-utilization of library support services. While I have a relatively involved and active relationship with our university's School of Education, there are teacher candidates that I do not have more than one library instruction session of contact with. In order to address this problem, I recently developed ED 593 (Exploring the Digital Pipeline Databases), a continuing education course offered to teachers and school librarians/media specialists in our local school district. I designed this one credit, 18 hour course to help educators become more aware of information

resources available for K-12 students in our state, and to teach these educators to develop and use pedagogical tools to teach information literacy concepts and research strategies to their K-12 students.

Thomas: Jennifer and I *are* preparing information literate special education teachers, and I feel good about that. Candidates graduate from our program with the information literacy skills necessary to locate, critically evaluate, and effectively use educational research to benefit their (K-12) students. However, I am concerned that we may not be doing enough to help our candidates integrate information literacy skills and research concepts into the K-12 curriculum, and I am not convinced that we are explicitly preparing our candidates to *teach* information literacy concepts and research skills to their K-12 students. We *do* model collaborative instruction between an educator (Thomas) and librarian (Jennifer), and we *do* offer inquiry-based learning activities that require our candidates to utilize a variety of real-world information resources; we also require our candidates to explicitly connect inquiry-based learning activities to their work with actual special education students. Sometimes, however, I worry that our candidates won't generalize the information literacy concepts and research skills that we teach them – that they won't apply these concepts and skills to their own classroom teaching – but then, occasionally candidates will tell us that they have adapted one of our assignments and used it with their own K-12 students; this fills my heart with happiness, because this is *exactly* what I want them to do.

Theme 3: Collaboration

Effective integration of information literacy concepts and research skills across the K-12 curriculum requires the collaborative efforts of teachers and school librarians, but such efforts are often unsuccessful. Teacher education programs need to better prepare teachers to collaborate

with school librarians and media specialists. Exposure to academic and school librarians in teacher education programs can help teacher candidates better understand the role of the school librarian as a collaborative partner and co-teacher, and outreach by academic and school librarians to teachers and teacher educators can promote effective collaborative partnerships in K-12 schools and universities. In some innovative teacher education programs, academic librarians and teacher educators have collaborated to develop, deliver, and evaluate individual instructional sessions and/or entire university courses that integrate information literacy concepts, educational theories, pedagogical methods, research strategies, and technology instruction; unfortunately, such collaborations are still the exception, rather than the rule, and more librarian-faculty collaboration is needed to prepare teachers to pass on information literacy skills to their K-12 students.

Jennifer: I think my collaboration with Thomas is a successful model of what good can come from collaboration between librarians and teacher educators, but I do believe that more can be done to promote collaboration between classroom teachers and librarians/school media specialists in the K-12 setting. I try to facilitate this connection in ED 593 (Exploring the Digital Pipeline Databases) – the continuing education course I offer at least two times per year for local educators. By guiding local teachers in creating assignments designed to address information literacy in their students, and by identifying that need and how school librarians can assist with this, I think I am introducing a little more awareness. There is a local school librarians' group in Juneau, and I will pursue becoming more connected with these professionals to offer training and workshops on a regular basis.

Thomas: I possess strong content knowledge about the discipline of special education, and have designed and conducted numerous qualitative studies in school settings; I do not, however,

have a strong information literacy background. I invited Jennifer to co-teach with me because she *does* have a strong background in information literacy and library instruction. She also possesses technical skills that I lack. Jennifer and I are effective co-teachers: she teaches our candidates to conduct systematic and reproducible database searches; I help our candidates develop research questions and search terms based on their research topics. Jennifer teaches our candidates (and me) to conduct *secondary* research; I teach our candidates (and Jennifer) to conduct *primary* research. Our candidates benefit from Jennifer's expertise with information literacy, and her experience conducting secondary research; the candidates benefit from my knowledge of special education, and my experience conducting primary research; our candidates also benefit from their year of consistent exposure to a librarian and educator who collaborate as instructional partners. Jennifer and I have learned a great deal from each other, and are better researchers and more effective instructors because of our collaborative relationship. My work with Jennifer has deepened my appreciation and understanding of information literacy, academic librarians, library instruction, and interdisciplinary collaboration for the purposes of research and instruction.

Theme 4: Technology and Information Literacy

Technology and the Internet have transformed definitions of literacy and revolutionized how people seek and gather information. Contemporary K-12 students must learn to effectively use technology to locate and information if they are to survive and thrive in this digital age. Contemporary teachers must be proficient in the use of technology if they are to effectively teach information literacy concepts and research skills to their K-12 students. Technical proficiency alone, however, cannot adequately prepare teachers to integrate technology into the K-12 curriculum because technology integration is, largely, a pedagogical endeavor. Technology

integration needs to be taught, modeled, and practiced along with information literacy and the collaboration required to support it. Teacher education programs should prepare teachers to collaborate with school librarians and media specialists to effectively integrate technology into K-12 curricula. Teacher educators and academic librarians can (and should) explicitly model technology integration, information literacy, and librarian-faculty collaboration for pre-service and in-service teachers.

Thomas: In ED 626 (Classroom Research), EDSE 692 (Secondary Research Methods), and EDSE 698 (Master's Thesis Project), we teach our candidates to conduct systematic and reproducible searches of numerous databases that index articles related to the field of education. We require our students to search ERIC (Ebscohost), Education Journals (ProQuest), Wilson Education Abstracts (ProQuest), and the Professional Development Collection (Ebscohost), and we encourage them to search additional databases that index articles related to their particular research topics and student populations (e.g., the Hubert Wegner Eskimo Database, Database of Best Practices on Indigenous Knowledge, Alaska and Polar Periodical Index). In order to help our students learn complex search skills via a distance-delivered format, Jennifer and I offer a series of individualized web-based tutorials using Elluminate, an interactive WebMeeting tool that allows our candidates to view database screens in "real time" as we guide them through their respective searches. We augment these individualized tutorials with a series of web-based presentations that Jennifer developed using Micromedia Breeze – a software application that works as a plug-in with Microsoft PowerPoint. The Breeze presentations are, essentially, narrated slideshows that explain the mechanics of database searching to our students. We post the Breeze presentations to our course websites, and ask our candidates to view the presentations *before* attending their individualized tutorials. Jennifer and I both provide additional support to

the candidates, via audio-conference – and on an "as needed" basis – as they continue to locate and retrieve articles to include in their thesis projects.

Jennifer: Our university offers a distance-delivered graduate degree in Educational Technology. As an outreach services librarian and liaison to the School of Education, I sometimes work with the candidates enrolled in this program. The faculty member who coordinates the Educational Technology program is information literate, and values information literacy, but I do not have a full knowledge of this program's information literacy goals and requirements. I think a more comprehensive understanding of the Educational Technology program would help me better support these candidates in their efforts to use technology to strengthen information literacy in K-12 schools. The educational technology candidates take ED 626 (Classroom Research) – it is a required course for all of the M.Ed. in Education programs at our university – so I meet with these students toward the end of their program, but it would be helpful for me to know more about their program's required courses and assignments, and to investigate if there is anything I can do to help the Educational Technology candidates integrate technology into their classroom curricula.

Theme 5: Information Literacy Standards

In 1989, the ALA recommended that teacher education programs adopt information literacy performance standards for pre-service and in-service teachers. In 1998, the ACRL reported that teacher education programs had made little progress in adopting or implementing such standards. In the last decade, however, many agencies, organizations, and institutions that govern, accredit, and support primary, secondary, and post-secondary education in the U.S., Canada, Australia, and New Zealand have adopted information literacy standards for students and teachers. These standards can (and should) be used to develop, implement, and evaluate

effective information literacy-related instruction at the primary, secondary, and tertiary levels.

Academic librarians and teacher educators should use these standards to prepare information

literate teachers.

Thomas: In 2000, the Alaska State Board of Education and Early Development added

information literacy standards to the *Alaska Content Standards,* which describe what K-12

students in Alaska "should know and be able to do as a result of their public school experience"

(Alaska Department of Education & Early Development, 2000, p. 1). In 1994, this same board of

education adopted teacher education standards that describe the "skills and abilities ... teachers

... need to possess to effectively prepare ...students ... for successful lives and productive

careers" (Alaska Department of Education & Early Development, October 29, 2008,

http://www.eed.state.ak.us/standards/pdf/teacher/pdf). Unfortunately, these *Standards for*

Alaska's Teachers do *not* address information literacy concerns. So, *students* in Alaska are

required to demonstrate information literacy skills, but no such standards are in place for

teachers. I ask myself, if teachers are not information literate, how can they possibly prepare

information literate students? Perhaps the members of the Alaska State Board of Education

assume that anyone who graduates from a teacher education program *must* be information

literate – perhaps they assume that *all* university graduates are information literate – but my own

experience leads me to believe otherwise; as a professor of education, I have taught many

intelligent, hard-working, fully certified teachers who lacked strong information literacy skills,

and – in the not so distant past, I *was* one of those teachers. Several years ago, our university

developed a set of information literacy competencies that undergraduate students must

demonstrate before they graduate. Jennifer and I embedded these information literacy

competencies, along with the *ACRL Information Literacy Competency Standards,* in ED 626

(Classroom Research), EDSE 692 (Secondary Research Methods), and EDSE 698 (Master's Thesis project). Many of our candidates lack strong information literacy skills when they begin the M.Ed. in Special Education program, but Jennifer and I help them develop, practice, and strengthen these skills, and – by the time they graduate – our students *are* information literate.

Jennifer: I insisted that the *ACRL Information Literacy Competency Standards* be integrated into ED 626 (Classroom Research), EDSE 692 (Secondary Research Methods) and EDSE 698 (Master's Thesis Project), along with the other standards that normally guide and inform education courses at our university (e.g., *Standards for Alaska's Teachers, Alaska Content Standards*). I do not know if the ACRL standards are addressed in the other School of Education programs at our university (e.g., Elementary Education, Secondary Education, Reading, Mathematics Education, Early Childhood Education, Educational Technology), but I should find out. I became especially aware of the information literacy component of the *Alaska Content Standards* for K-12 students when I developed ED 593 (Exploring the Digital Pipeline Databases). The assignments and activities I developed for ED 593 now directly address the *Alaska Content Standards.* I need to directly address these standards in the future assignments I create for other School of Education courses, and see if these standards can be integrated more systematically into other School of Education programs.

Conclusion

Contemporary K-12 students must learn to navigate a rapidly changing and increasingly complex electronic landscape if they are to survive and thrive in this Information Age. Teachers (including school and academic librarians, K-12 classroom teachers, and teacher educators) must model and teach information literacy skills and research strategies if they are to empower their students to actively contribute to the development of pluralistic, socially just, 21st century

democracies. In 1998, the ACRL reported that teacher education programs in the U.S. had made

no real progress in modifying course requirements and performance expectations to address the

information literacy concerns first delineated by the ALA Presidential Committee on Information

Literacy in 1989. Our review of the literature, which examined journal articles and book chapters

published in the decade since the ACRL issued *A Progress Report on Information Literacy,*

indicates that teacher education programs *have* made significant progress in addressing

information literacy concerns during these last ten years. Numerous articles and chapters

included in this review described innovative teacher education programs that regularly exposed

teachers to academic and school librarians, embedded information literacy instruction in

education courses, prepared teachers to collaborate with school librarians, and encouraged

teachers to utilize inquiry-based instructional approaches based on the information resources of

the real world. However, significant work remains to be done. Many teachers continue to

graduate from university-based teacher education programs with insufficient information literacy

skills; these teachers are often unprepared to teach information literacy skills and research

strategies to their K-12 students. Many teachers continue to disseminate ready-made information

to their students – and to rely on rote-learning activities – instead of offering their students *active*

learning experiences that facilitate knowledge construction and promote critical thinking skills

and problem solving abilities. Many teachers have not been taught to view school librarians as

collaborative partners and co-instructors; such teachers are often unaware that school librarians

are *eager* to help them integrate information literacy into the K-12 curriculum.

   This review of the literature has strengthened our belief in the value and importance of

collaboration between educators and librarians at the K-12 and post-secondary levels. We urge

teacher education administrators and school district policy-makers to create more opportunities

for meaningful collaboration between librarians and educators – collaboration on individual

assignments, tutorials, and instructional sessions, but also *deeper* collaboration involving the

development, implementation, and assessment of curricula, courses, and standards designed to

prepare information literate citizens to thrive in 21st century democracies.

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