

University of San Diego

Digital USD

Dissertations

Theses and Dissertations

2008-12-01

Developing an Instrument to Measure School Community Engagement with Implementation of Information Literacy Curriculum

Candace Wexler Aiani EdD
University of San Diego

Follow this and additional works at: <https://digital.sandiego.edu/dissertations>



Part of the [Leadership Studies Commons](#)

Digital USD Citation

Wexler Aiani, Candace EdD, "Developing an Instrument to Measure School Community Engagement with Implementation of Information Literacy Curriculum" (2008). *Dissertations*. 781.
<https://digital.sandiego.edu/dissertations/781>

This Dissertation: Open Access is brought to you for free and open access by the Theses and Dissertations at Digital USD. It has been accepted for inclusion in Dissertations by an authorized administrator of Digital USD. For more information, please contact digital@sandiego.edu.

**DEVELOPING AN INSTRUMENT TO MEASURE SCHOOL COMMUNITY
ENGAGEMENT WITH IMPLEMENTATION OF INFORMATION LITERACY
CURRICULUM**

by

CANDACE WEXLER AIANI

A dissertation in partial fulfillment
of the requirements for the degree of

Doctor of Education
University of San Diego

December 2008

Dissertation Committee:

Dr. Fred J. Galloway, Ed.D., Chair
Dr. Robert Donmoyer, Ph.D., Member
Dr. Lee Williams, Ph.D., Member
Dr. Daniel J. Callison, Ed.D., Member

ABSTRACT

The purpose of this study was to develop a valid and reliable survey instrument to be used by librarians and other educational leaders to measure implementation of a school's information literacy program. The goal was to create an instrument that would consider implementation of a library-centered program within the context and culture of the whole school. Once developed, the survey would identify areas of strength and weaknesses in implementation, allowing schools to design interventions and professional development opportunities to further implementation.

A theoretical basis for measuring implementation as well as an initial set of dimensions of implementation was identified during a review of the literature. Existing measures of implementation-- New American Schools: Whole School Reform; *The Degree of Implementation Scale* from character education; and the *Concerns-Based Adoption Model*—influenced the identification of the dimensions of implementation. A Delphi study--drawing experts from both the fields of library science and educational leadership—was used to further develop the dimensions, to identify specific sets of survey questions for each dimension, and to suggest demographics that might explain differences in implementation. A small pilot group improved the general soundness of the

draft instrument and the survey instrument was then administered to random and convenience samples of 326 librarians and teachers.

The finalized instrument included a set of 34 questions on school characteristics and another set of 9 questions on implementer activities. A principal components factor analysis revealed a four-factor solution for the thirty-four survey items: (1) program articulation and development, (2) school culture, (3) curriculum and instruction, and (4) librarian as key implementer. Item analysis of factors showed strong internal consistency (Cronbach's alpha) and strong corrected item-total correlations. In addition, inferential techniques like analysis of variance and independent sample t-tests were used to identify demographic differences among the implementation factors; these significant demographic variables included school type, grade levels, language proficiency, FTE librarians, and FTE support staff.

The researcher recommends that the instrument be used to evaluate school programs, never the performance of individuals. When the study is replicated, the researcher recommends increasing the sensitivity of the answer choices related to implementer activities.

DEDICATION

For my daughters,

Jessica and Chloe,

That you too may realize yours dreams.

ACKNOWLEDGEMENTS

It is my privilege and pleasure to publicly thank those individuals who have supported me so well during this journey.

First and foremost, I would like to acknowledge my dissertation committee: Dr. Fred Galloway, my incredible committee chair, who guided my work with enthusiasm, encouragement, and a great sense of humor; Dr. Bob Donmoyer, committee member, who helped me bridge my writing as a educational practitioner with that of my writing as an academic; Dr. Lee Williams, committee member, who inspired me to pursue instrument development and who offered me precise, insightful advice along the way; and Dr. Daniel Callison, committee member, who held me to a rigorous standard and without whose support I would likely not have pursued the doctorate at all. Every member of my committee contributed to my work in unique and important ways but, more importantly, each offered unwavering support along the way. I cannot thank you all enough.

I would also like to thank my cohort--Toni, Pat, Chrissie, Brian, Jim, Carol, Kacy, and Catriona--who spent summers and many emails to advise, commiserate and celebrate:. My connections with all of you made the journey one of friendship and collegiality. A special thanks to Catriona, who led the way and shared her experience.

I want to thank my friends and colleagues at Taipei American School, who listened, questioned, participated, and generally just took an interest in the work, including: all those who took the survey and provided feedback; my talented and highly professional library colleagues; and, in particular, Glenn Wolfe for his many years of support and friendship.

I also wish to acknowledge Beth Yemma for her organization and advocacy with everyone on campus on behalf of all of us; Kate Sheridan for her wonderful editing eye; and Dr. Paula Codeiro, Dean of the School of Leadership and Education Science (SOLES) who had the vision and wherewithal to create an international-school-leadership cohort.

Thank you also to Alfred who made statistics and statistical analysis my friend. Your perceptions and sense of humor kept me sane. Thank you, Mom, for always greeting my calls with love and joy, even across time zones and at all hours of the day and night. I always knew I could phone. And thank you to my sisters and brothers—Karen, Dawn, Nancy, Martin, Michael, and Keith—who simply believed in me.

And finally, I wish to acknowledge and thank the love of my life, my husband, Greg, and my beautiful daughters, Chloe and Jessica, who made daily sacrifices in support of my success. I love you.

TABLE OF CONTENTS

ABSTRACT.....	iv
DEDICATION.....	vii
ACKNOWLEDGMENTS.....	viii
TABLE OF CONTENTS.....	x
LIST OF TABLES.....	xiii
LIST OF FIGURES.....	xv
CHAPTER	
1. INTRODUCTION TO THE STUDY.....	1
Background to the Study.....	1
Statement of the Problem.....	16
The Purpose of the Study.....	17
Research Questions.....	17
Definitions of Terms.....	18
2. REVIEW OF THE LITERATURE.....	21
Information Literacy.....	23
Defining Information Literacy.....	23
Information Literacy Standards & Technology Standards.....	26
Information Literacy: A Recognized Educational Need... ..	31
Issues of Receptivity in Schools.....	32
Program Goals & Implementation.....	32
Collaboration as a Condition of Implementation.....	34
Constructivism and Process Learning.....	36
Assessments as an indicator of Implementation.....	39
School Culture and Program Implementation.....	42
Professional Development in Program Implementation.....	43
Program Support & Evaluation in Implementation.....	44
Role of Implementer in the Change Process.....	46
Existing Measures of Implementation.....	48
New American Schools: Whole School Reform.....	48
Character Education: <i>Degree of Implementation Scale</i>	49
Concerns-Based Adoption Model (CBAM).....	50
3. RESEARCH DESIGN AND METHODOLOGY.....	51
The Delphi.....	51

Goals of the Delphi.....	52
Expert Group Selection.....	54
Data Collection.....	58
Data Collection: Round One.....	58
Data Collection: Round Two.....	65
Pilot Study.....	67
Participant Selection.....	67
Data Collection.....	67
Survey Administration.....	69
Introduction.....	69
Survey Participants.....	69
Data Collection: Administration of the Survey.....	71
Data Analysis: Factor analysis and item analysis.....	73
4. FINDINGS OF THE STUDY: DATA ANALYSIS.....	75
Delphi Findings.....	76
Introduction.....	76
Round One Data Analysis.....	76
Round Two Data Analysis.....	83
Draft Instrument	88
Pilot Study Findings.....	90
Pilot Participants.....	90
Pilot Study Data Analysis.....	91
Survey Administration Findings.....	100
Introduction.....	100
Section I: Questions 1 – 37 (7-point Likert)	101
Item Analysis	101
Cronbach’s Alpha.....	107
Item Means.....	108
Item Variances.....	108
Inter-item Correlations.....	108
Factor Analysis.....	116
Section II: Questions 38 – 39 (5 item choice)	129
Section III: Questions 40 – 48 (3 item choice)	132
Section IV: Questions 49 – 55 (Demographics)	132
Comparison of Sample Groups: Teachers and Librarians.....	139
Finalizing the Instrument.....	142
5. SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS.....	149
Research Questions.....	149
Research Question #1.....	149
Research Question #2.....	151
Research Question #3.....	152
Research Question #4.....	154
The Finalized Instrument and the Literature.....	160
Limitations of the Study.....	167

Significance of the Study.....	169
Recommendations	171
Use of the instrument.....	171
Further research.....	174
REFERENCES.....	177
Appendix	
A. Expert Group Introductory Letter	198
B. Cover Letter for Delphi: Round One.....	201
C. Research Participant Consent Form: Delphi.....	204
D. Questionnaire for Round One of the Delphi.....	207
E. Delphi: Round One Follow-up Email.....	219
F. Delphi: Round Two Introductory Email.....	221
G. Delphi: Round Two Instructions.....	223
H. Questionnaire for Round Two of the Delphi.....	225
I. Delphi: Round Two Follow-up Email.....	243
J. Delphi: Results from Round Two.....	246
K. Pilot: Guiding Questions.....	254
L. Research Participant Consent Form: Pilot.....	256
M. Listserv Moderator Letter.....	259
N. Email/Posting to Introduce Survey.....	261
O. Research Participant Consent Form: Survey.....	263
P. Survey at Completion of Delphi.....	266
Q. Survey at Completion of Pilot.....	273
R. Histograms for Items Q40-Q48.....	282
S. Finalized Instrument [To Be Included].....	288

LIST OF TABLES		Page
Table 1.	Experts' professional experience and background.	p.56
Table 2.	Questions included in Round One of the Delphi phase of the study.	p.61
Table 3.	Round One results: measures of central tendency.	p.77
Table 4.	Round One results for demographics.	p.79
Table 5.	Round One final results: measures of central tendency.	p.80
Table 6.	Round One final results for demographics.	p.82
Table 7.	Summary of Round Two results.	p.84
Table 8.	The items in the survey at the conclusion of the Delphi and pilot.	p.93
Table 9.	Item analysis statistics for dimension 1: recognized need.	p.102
Table 10.	Item analysis statistics for dimension 2: policy.	p.103
Table 11.	Item analysis statistics for dimension 3: outcomes.	p.103
Table 12.	Item analysis statistics for dimension 4: integration.	p.104
Table 13.	Item analysis statistics for dimension 5: experiential learning.	p.104
Table 14.	Item analysis statistics for dimension 6: assessment.	p.105
Table 15.	Item analysis statistics for dimension 7: professional development.	p.105
Table 16.	Item analysis statistics for dimension 8: support.	p.106
Table 17.	Item analysis statistics for dimension 9: librarian characteristics.	p.106
Table 18.	Factor analysis results showing 4 factors.	p.117
Table 19.	Factor items (highlighted) and loading values.	p.118
Table 20.	Factor 1 reliability statistics.	p.120
Table 21.	Factor 2 reliability statistics.	p.122

LIST OF TABLES cont.

Table 22.	Factor 3 reliability statistics.	p.124
Table 23.	Factor 4 reliability statistics.	p.125
Table 24.	Four factor solution and final loadings (N=326).	p.126
Table 25.	Reliability of the factors.	p.128
Table 26.	ANOVA for Q49 (school type).	p.134
Table 27.	ANOVA for Q50 (grade levels).	p.134
Table 28.	ANOVA for Q51 (numbers of students).	p.135
Table 29.	ANOVA for Q52 (language proficiency).	p.136
Table 30.	ANOVA for Q53 (computer availability).	p.137
Table 31.	ANOVA for Q54 (FTE librarians).	p.138
Table 32.	ANOVA for Q55 (FTE support staff).	p.139
Table 33.	Descriptive Statistics for Teachers and Librarians	p.140
Table 34.	Correlations of Activities with Factors and Four-factor Scale (ILIS).	p.141
Table 35.	Final survey.	p.142
Table 36.	Questions for Factor 1: Program Development	p.162
Table 37.	Questions for Factor Two: School Culture	p.164
Table 38.	Questions for Factor Three: Curriculum & Instruction	p.165
Table 39.	Questions for Factor Four: Librarian as Key Implementer	p.167

LIST OF FIGURES

Figure 1.	Histogram for Item Q01	p.109
Figure 2.	Histogram for Item Q30	p.110
Figure 3.	Histogram for Item Q32	p.111
Figure 4.	Histogram for Item Q37	p.111
Figure 5.	Histogram for Item Q07	p.114
Figure 6.	Histogram for Item Q12	p.114
Figure 7	Histogram for Item Q17	p.115
Figure 8	Histogram for Item Q29	p.115
Figure 9	Histogram for Item Q34	p.116
Figure 10	Average Score of 4 Factors Individually and Combined	p.129
Figure 11	Histogram for Item Q38	p.129
Figure 12	Histogram for Item Q39	p.131

Chapter 1

INTRODUCTION TO THE STUDY

Background to the Study

Technologies developed over the past forty years or so have resulted in a great expansion of access to new sources of information in a variety of formats, especially those rooted in the Internet and other electronic media. In fact, the expansion to new sources of information is so great that the term *Information Age* was coined many years ago to describe this unique period of time in which there was an explosion of new information and information technologies. Although an exciting period in history, the rise of the Information Age has brought with it—as might be expected—a number of new challenges as to how best to prepare young people to live and function in this new technological environment (Dept. of Labor, Washington, DC Secretary's Commission on Achieving Necessary Skills, 1991; National Education Goals Panel, 1993; *Presidential Committee on Information*, 1989; *A Progress Report*, 1998).

The challenges to educate our youth fall into two general categories: one is the challenge to provide physical access to environments—network services, computers and associated hardware, and software applications—where information technologies exist;

the other is the challenge to develop knowledge access, i.e., the range of skills and knowledge required by users to fully appreciate the information technologies available to them (Information and Communication Technology (ICT) n.d.). It can be argued that the first of these challenges, physical access to information, is primarily an economic issue, one that can be addressed successfully with adequate funding for network services, computers and associated hardware, and software programs (Compaine, 2001; Harris, Lee, & Raines, 2000).

The second challenge, knowledge access, is more problematic, however, because it requires that schools create programs that will help students to acquire appropriate information and technology skills and knowledge—hereafter referred to as information literacy—into existing curriculum programs (American Library Association (ALA) & Association for Educational Communications and Technology (AECT), 1998; Sutton, n.d.). To further add to this challenge, best practice supports information education through a cooperative program in which the skills and knowledge are integrated across the curriculum in the content areas, not as a group of isolated skills and bits of knowledge (American Library Association, 1998; Johnson & Eisenberg, 1999; Todd, 1995). This type of integration represents a complex change in school programming that affects

curriculum, including both teaching content and methodology; school culture; and organizational structure.¹

Not surprisingly, a professional group at the forefront of advocating for school programs that will ensure information literacy is the American Association of School Librarians (AASL), a division of the American Library Association (ALA). In an effort to define the challenge and to guide information literacy program development, the AASL published guidelines and recommendations in *Information Power: Building partnerships for Learning* (1998). These recommendations focused on building collaborative relationships with teachers in order to integrate information literacy skills and knowledge into the content areas. *Information Power* (1998) also identified nine teaching and learning standards that it called “The New Information Literacy Standards for Student Learning.” These nine standards describe the content and processes that students must master to become information literate.

¹ There is a strong relationship between physical access to information and knowledge access to information. Physical access is a necessary condition to develop knowledge access. The same is not true in reverse, however. Physical access can--and often does--exist without knowledge access ever following. In fact, *A Progress Report on Information Literacy: An Update on the American Library Association Presidential Committee on Information Literacy: Final Report(1998)* includes a recommendation by Forum members to conduct “a national re-evaluation of the seemingly exclusive emphasis on and enormous investments in computers and networks.” The Forum believes that information literacy skills are the key to realizing the “potential inherent in the Information Age” (American Library Association, 1998).

The information literate student:

- Accesses information efficiently and effectively.
- Evaluates information critically and competently.
- Uses information accurately and creatively.
- Pursues information related to personal interests.
- Appreciates literature and other creative expressions of information.
- Strives for excellence in information seeking and knowledge generation.
- Contributes positively to the learning community by recognizing the importance of information to a democratic society.
- Contributes positively to the learning community and to society by practicing ethical behavior in regard to information and information technology.
- Contributes positively to the learning community and to society by participating effectively in groups to pursue and generate information. (pp. 8-9)

These standards are central to the vision defined by Information Power for implementing an effective school library media program (ALA, 1998, p. 50).

In addition to these nine standards, and during the same approximate period in which these standards were developed, the International Society for Technology in Education (ISTE) led a partnership with the American Association of School Librarians (AASL), American Federation of Teachers (AFT), Association for Curriculum and Development (ASCD), Apple Computer, the Milken Exchange on Education, and the U.S. Dept. of Education (among others) to develop national technology standards for PreK-12 students (Sutton, n.d.). The partnership resulted in ISTE's *National Educational Technology Standards for All Students (NETS)* ("National Education Technology," n.d.). The *National Educational Technology Standards for All Students* are divided into six

categories and describe what students should know and should be able to do with

technology:

- Basic operations and concepts;
- Social, ethical, and human issues;
- Technology productivity tools;
- Technology communications tools;
- Technology research tools;
- Technology problem-solving and decision-making tools ("National Education Technology," n.d.).

In some places, the ISTE standards overlap with those outlined by AASL in *Information Power* (ALA, 1998), but, together, these two sets of standards represent “primary influences”—as defined by the United States Departments of Education—to address essential information literacy and technology skills and processes (Sutton, n.d.). In other words, these two documents greatly influenced and defined what should be taught by schools and what should be understood or known by students in the two closely related fields of information literacy and information technology.

Information Power (1998) also recommends a number of strategies to be used by school librarians to build knowledge and acceptance of information literacy standards through the development of school library programs. *Information Power* (1998) indicates that the three strategies—collaboration, leadership, and technology—are integral to every aspect of the library media program. The first strategy—collaboration—includes forming

partnerships with teachers, administrators, and curriculum developers. *Information Power* (1998) describes the second strategy—effective leadership—as taking advantage of “new opportunities [within the information society] to use more visible leadership strategies [by] exerting strong curricular and instructional leadership” (p. 52). And finally, the third strategy—using technology in developing a school library information literacy program—is intimately tied with retaining currency with emerging information formats and technologies that require continuous learning. In other words, *Information Power* (1998) seems to infer that to develop an effective information literacy program, the school librarian must have a role as a “primary leader in the school’s use of all kinds of technologies—both instructional and informational—to enhance learning” (p. 54).

So where are school libraries today with the implementation of information literacy programs in K-12 schools and school libraries? A number of indicators—both formal and informal—can be used to infer the state of program development. One indicator of strong curricular programs would be student achievement. Numerous, large, state studies conducted over the past decade have affirmed the positive impact of school libraries with qualified school library media specialists on student achievement (American Library Association (ALA), 2004; National Center for Educational Statistics. U.S. Department of Education, 2005; *School Libraries Work!*, 2006). In fact, these

studies have provided mounting evidence that a “direct correlation can be made between student achievement and school library programs” (Woolls, 2004, as cited in *School Libraries Work!*, 2006, p.6). Furthermore, those program characteristics that have the greatest impact on student achievement are primarily those associated with the implementation strategies outlined in *Information Power* (1998) and discussed above: leadership, collaboration, and access to current technologies (Woolls, 2004, as cited in *School Libraries Work!*, 2006, p.6). Data from the latest study, The Ohio Study (Todd, Kuhlthau, and OELMA, 2004), also highlights the impact of school librarians when working as both information specialists and as educational partner-leaders to implement a whole school program that is aligned with achievement goals for the whole school (*School Libraries Work!*, 2006, p.17). From these studies that substantiate a positive impact of school library media programs on student learning, one can infer that school library programs are generally moving in a positive direction with implementation.

In addition to these large state studies, professional library literature has a rich and on-going selection of articles by library practitioners, academics, and others in which the content frequently echoes or alludes to the implementation strategies of collaboration, leadership, and access to technology as originally defined through *Information Power* (1998). A recent issue of *Knowledge Quest*, the official publication of the American

Association of School Librarians (AASL), demonstrates the degree to which these topics are part of the culture of librarianship. In the May/June 2005 issue, collaboration, leadership, and technology are all included as topics of various articles: the article on collaboration is called “Collaboration: Ten Important Reasons to Take It Seriously” (Milbury, 2005); another on leadership is called “Library Leaders: Your Role in the Professional Learning Community” (Frost, 2005); and finally, the one on technology is called “Technology Matters” (Lemmons, 2005). In addition, the keynote article for the month in this one publication entitled “The Emerging School Library Media Center: From the Past into the Future” (2005). In this article, Betty J. Morris (2005) alludes to these roles as well. Morris describes the future school library media specialist as informational leaders, evaluators, and cataloguers, all of which, she says, rely on, among other things, the current emphasis for “collaboration and student learning, and new technological development” (Morris, 2005, p.25). Collaboration, leadership, and technology are themes for discussion that permeate the professional library literature.

Despite evidence that demonstrates the positive impact of strong school library programs, and despite the rich professional sharing around the topics of collaboration, leadership, and technology, some would argue that implementation of school information literacy programs has not occurred or has not been successful. According to researcher

Ken Haycock, “Implementation does not occur, and does not reach a stage of institutionalization, of becoming an integral, essential part of the fabric of the school” (Haycock, 1998). Haycock describes a general criterion for assessing the level of integration, a criterion that can be inferred from the vision for information literacy programs explicated in *Information Power* (1998): the level of integration at which a school can ensure knowledge access for *all* students. In addition, librarians themselves report anecdotally that they do not achieve a satisfactory level of integration across the curriculum.² Some of the reasons reported as to why they believe their information literacy programs fall short of full implementation include such things as: teacher resistance to collaboration, lack of administrative support, heavy workloads and shortage of time, marginalization departmentally or personally, and lack of professional knowledge.

So what does it mean for a program to be integral and essential? Haycock (1998) seems to imply a quality that is so widespread as to be embedded in the educational school culture, essential to a shared vision of what students should know and should be

² At national librarians’ conferences, such as AASL in Pittsburgh (October, 2005), and regional conferences, such as EARCOS: ETC 2005 (March, 2005) conference in Ho Chi Minh City, Vietnam, librarians reported inconsistent results with collaboration: sometimes with isolated pockets of teachers, grade levels, or departments; often it is limited to specific units of study or during specific times of the school year. The general consensus is that systemic integration does not take place.

able to do. The term “essential” also seems to infer that this program would serve all students, not just subgroups of students. Assuming that information literacy skills and processes are not currently embedded in the curriculum and culture of a school, this definition by Haycock (1998) suggests a need for whole-school change or reform, something that is not easy to achieve (Milstein, 1993). Once achieved, however, the implementation of an information literacy program would have—at least theoretically—an institutional impact that could be likened to whole school reform, a complex change that would involve and impact all students, teachers, administrators and the entire educational community in a school.

I would argue that this kind of systemic, whole school change or reform may be inconsistent with the more grassroots approach generally used by librarians who attempt to implement an information literacy program by building on collaborative relationships over time. The goal of this traditional grassroots-type approach seems to be to add onto single collaborative experiences until the program reaches a “the tipping point” where all teachers desire the collaborative experience in order to provide their own students with quality information literacy learning. When all students have an equal opportunity to acquire quality information literacy skills, the program could be considered systemic, and perhaps even integral and essential. Before that point, information literacy is perhaps

integral and essential for selected subgroups within in a school, but not to the school as a whole.

So how does one measure the degree to which an information literacy program is an integral, essential part of the fabric of the school? To my knowledge, no quantitative instrument exists that actually measures the degree of implementation of an information literacy program in a school.³ One reason for this might be that information literacy programs are considered one part of a larger school library media program and are generally assessed within the context of a whole program that includes other aspects of the library: collections, facility, technology, personnel, etc. (Everhart, 1998). Even the state studies described above acknowledge that the impact of information literacy strategies is intimately connected with other whole library program or facility characteristics—those which lie outside of what might be considered strictly the information literacy component of the whole library program. Some of the other characteristics that impact student learning include, but are not limited to: flexible

³ I searched multiple databases—including ERIC, Professional Development Collection, Dissertation Abstracts, Academic Search (Ebsco)--using multiple subjects and keywords. I also searched several web sites including but not limited to: Research for Better Schools, Buros Institute, and Behavioral Measurement Database Services.

scheduling, higher staffing levels, larger and more current collections, greater access to educational technologies, and larger budgets (*School Libraries Work!*, 2006).

One general approach to library program evaluation is to assess individual student knowledge as evidence of the effectiveness of educational approaches or programs. For many educators and school reformers, this means using standardized scores to guide initiatives for school improvement. This proves problematic when applied to information literacy in schools because no standardized testing instrument exists at the K-12 level that measures information literacy proficiencies, nor is there an information literacy component within nationally or regionally recognized standardized testing such as Comprehensive Test of Basic Skills (CTBS) or the Iowa Test of Basic Skills (ITBS). Recognizing that there is a lack of even the most basic data on the current status of information and communication technology literacy, the National Higher Education Information and Communication Technology (ICT) responded to this need by joining seven leading college and university systems with Educational Testing Services (ETS) to develop “a highly innovative, simulation-based assessment to measure the breadth and depth of ICT proficiency” (ICT, n.d., preface). The goal of this test is to “provide colleges and universities with the measurement basis they need to evaluate their existing approaches to ICT education and to develop new strategies for closing the gap between

those who possess essential ICT skills and those who do not (n.d., preface). To my knowledge, this type of nationally-recognized, standardized testing instrument—performance-based or otherwise—does not exist at the K-12 level. That means that K-12 institutions must either develop a similarly standardized test appropriate for elementary and secondary students, or use another type of assessment to evaluate the development of information literacy programs.

When information literacy program assessment is addressed in the literature, there are two other approaches that seem to appear frequently. One approach is to evaluate the success of a program by gathering evidence of successful collaborations and of positive impact on student learning that resulted from the implementation of information literacy learning. This strategy—commonly called evidence-based practice—is a valuable approach for demonstrating the benefits of information literacy instruction and for advocating within the school community for program support (Todd, 2001). One could even argue that this approach is also an appropriate tool for measuring the development of an information literacy program; it follows logically that the more evidence of student learning that one is able to collect, the greater the degree of a successful implementation of an information literacy program.

Another approach to program evaluation that appears in the literature is to evaluate the quantity and quality of the librarian's collaboration with other professionals in the school and his/her role on the instructional design team (Everhart, 1998). This approach focuses on the role of the librarian in the implementation of an information literacy program. Everhart (1998) even provides a self-assessment instrument designed to help the librarian assess his/her own effectiveness. This approach is valuable for helping a librarian assess areas of personal strength and potential areas for improvement or growth. It can guide professional development or simply provide a picture of the current climate of the school in relation to the implementation of an information literacy process.

What seems to be missing in all of these approaches is an evaluation of the implementation of an information literacy program within the context of the school and school culture, an approach that evaluates information literacy program development using a systemic perspective. This type of approach would answer the question: Where does the program fit or how does it operate within the context of the whole school or curricular program? Models for this type of evaluation exist within whole school reform movements (Berends, Kirby, Naftel, & McKelvey, 2001) and also within character education development (Cooperating School District, 1999), a movement that uses

similar implementation strategies of integration across the curriculum. When program implementation is evaluated within the context of the whole school and school culture, a more realistic picture may be obtained about the opportunities and barriers that exist for implementation of a program within the whole school context. In addition, the results or data collected from this type of evaluation may speak more readily to and be understood by the whole school community since they would presumably understand the whole school context. Unfortunately, this type of instrument does not exist.

The premise that the degree of implementation of a program can be measured is supported by the use of implementation instruments in other education fields. One example is the *Degree of Implementation Scale* (Cooperating School District, 1999) that is designed to measure the degree to which a character education program, Character Plus (2005), has been implemented within a school. This instrument was designed around “eleven critical factors that the Character Education Partnership (Lickona, 1996) believed should be in place for a character education program to be effective” (Denbow, 2004). These eleven critical factors were used to operationalize the construct of implementation of character education. This theoretical and practical approach provides a model for this study.

Statement of the Problem

The implementation of Information Literacy Programs, as defined and outlined in *Information Power* (1998), has been a goal of the library profession over the past two decades. Librarians have been engaged in teaching information literacy skills and have made a contribution to the general recognition of the need for future workers to have information and technology skills. In spite of this growing recognition of the importance of information literacy, K-12 school information literacy programs have not reached what Haycock (1998) calls “a stage of institutionalization,” a place where they would be considered “an integral, essential part of the fabric of the school” (Haycock, 1998, p.12).

Assessing the degree to which a program has been implemented—or reached a stage of institutionalization—requires an instrument to measure that phenomena. To the best of my knowledge, one does not exist within the school library profession. Without this type of tool, librarians can intuitively state that they have not reached their goal of institutionalization, but they cannot say how close or how far they are with implementation, and they have little empirical evidence to help them understand ways in which implementation is successful and ways it is not. In the absence of this tool, librarians also lack empirical data that could bridge communication with administrators and district personnel whose support is needed for program development. And without a

tool to help them analyze factors related to program implementation, librarians themselves may not understand what is lacking or what is required to reach a stage of institutionalization.

The Purpose of the Study

The purpose of this study is to develop a valid and reliable instrument to measure the degree of implementation of a K-12, school library information literacy program. The theoretical basis for the instrument is that a school library information literacy program is one which is “an integral, essential part of the fabric of the school” (Haycock, 1998, p.12). The instrument will help libraries and schools measure the degree to which implementation has been accomplished. The instrument will be designed to evaluate only the information literacy component of the more encompassing school library media program that includes other program components such as collection development, facility maintenance, and so forth. The implementation instrument will be designed to be used by school administrators and curriculum planners in addition to library personnel.

Research Questions

1. What are the critical factors or conditions of implementation—hereafter referred to as simply *dimensions of implementation*—that need to be in place for an

information literacy program to be integral, essential, and systemic? These dimensions of implementation will form the basis of the instrument.

2. How can the identified critical factors or degrees of implementation be operationalized in order to measure them (i.e., what are the questions that will operationalize the critical factors or degrees of implementation)?
3. Is the newly created instrument valid and reliable?
4. What demographic data can potentially explain differences in program implementation? Do the demographic data appear to account for differences among the sample group?

Definition of Terms

Terms to be used in this study follow are defined in the following ways:

1. Information Literacy: a general term to describe those skills and processes associated with a person's ability to find and use information. The term includes, but is not limited to, early definitions as defined by the American Library Association (ALA) & Association for Educational Communications and Technology (AECT), 1998, as well as more recent definitions of inquiry, such as those in Stripling (2004), Harada and Yoshina (2004), and Callison (2006).

2. Information literate person: a person able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information (Presidential Committee on Information Literacy, 1989; Marcoux, 1999).
3. Performance and Authentic Assessment: There is a lack of consensus among researchers about the meaning or distinction—if any—between *performance assessment* and *authentic assessment* (Frey and Schmidt, 2007). For the purpose of this study, a broad definition by Madaus and O’Dwyer (1999) for *performance assessment* will be used: “performance assessment requires examinees to construct/supply answers, perform or produce something for evaluation” (p. 689).

For the purpose of this study, a definition of authentic assessment by Newmann (1998) will be used: “tasks that pose questions, problems, and issues to students that have some meaning or value beyond achieving success in school” (p. 19).

Newmann calls this a “real world” dimension and includes “construction of knowledge” and “disciplined inquiry” as additional dimensions required for a task to be “authentic” (p. 19).
4. School Librarian: an education professional who holds a master’s degree or equivalent from a program that combines academic and professional preparation

in library and information science, education, management, media, communication theory, and technology (American Library Association (ALA) & Association for Educational Communications and Technology (AECT), 1998; Marcoux, 1999).

5. School Library Media Program: an integrated, student centered educational program encompassing all the resources and activities that promote the mission of the school library media program. The mission ensures that students and staff are effective users of information, accomplished by providing intellectual and physical access to materials in all formats; providing instruction to foster competence and stimulate interest in reading, viewing, and using information and ideas; (Marcoux, 1999); working with other educators to design learning strategies to meet the need of individual students (American Library Association (ALA) & Association for Educational Communications and Technology (AECT), 1998).
6. School Library Information Literacy Program: an integrated, student centered educational program—a portion of the overall school library media program--encompassing all the resources and activities that promote information literacy.

Chapter 2

REVIEW OF THE LITERATURE

Michael Fullan (2001a), an international authority on educational reform, wrote that when it comes to leading change in an educational environment, it is not enough to have the good ideas. He also argues that it is even possible to be “dead right,” to have the best ideas around, and still not be able to get anyone to buy into them (Fullan, 2001a, p. 38). This idea can be applied to a small, local educational change such as the use of a particular lesson, book, or method for teaching a concept, or to major educational change that involves a shift in paradigmatic thinking, such as large scale national curriculum reform. One change initiative that seems to fall into this category is information literacy education, the goal of which is to “ensure that students and staff are effective users of ideas and information” (ALA, 1998, p. 6). Information literacy education is a great idea with a long history of efforts to create buy-in at the national, state, local, and international levels through implementation of school library information literacy programs.

The purpose of this review of the literature is threefold: to define what is meant by information literacy; to investigate what conditions or characteristics of a school—according to the research—would be conducive to or evidence of successful implementation of an educational innovation including information literacy; and to explore what other instruments or methods exist for measuring implementation. The review of the literature is organized into three sections: information literacy, issues of receptivity, and measurement.

The first section involves the concept of information literacy itself. This section answers the questions, *what is information literacy?* and *why is it important?* To investigate the literature on information literacy, I looked primarily to the field of library and information sciences, especially as it relates to K-12 schools and education. I used academic texts and journals as well as practitioner-level articles and networking tools (i.e., listservs, blogs, etc.) for information about current practice in information literacy program planning and implementation.

The second section includes issues of receptivity in a school. This section answers the question *what conditions or characteristics of a school are required for successful implementation?* The third section looks at other existing instruments or guidelines to measure implementation. This section answers the question *How can one measure*

implementation? To investigate both program implementation and implementation instrument, I looked primarily to the field of education, particularly in the areas of school change, school improvement, whole school reform, and program implementation.

Information Literacy

Defining Information Literacy

Multiple definitions for the concept of information literacy exist and have evolved over the past several decades. Introduced in 1974 by Paul Zurkowski, president of the Information Industry Association, the concept of information literacy was first defined as people using a variety of information tools to mold information solutions to work-related problems (as cited in Taylor, 2006). Carroll (1981) expanded the definition to include the use of facts and information to enrich various parts of one's life, not just work, but leisure and personal interests as well. The National Commission on Libraries and Information Science (NCLIS) defined the role of education in information literacy when it stated that a basic objective of education is to teach students how to identify needed information, locate and organize it, and present it in a clear and persuasive manner (Haskim, 1986, reported in Spitzer, Eisenberg, and Lowe, 1998, p. 41).

The American Association of School Librarians (AASL) and the Association for Educational Communications and Technology (AECT) further supported the role of education, particularly the school library media program, when it published *Information Power: Guidelines for School Library Media Programs* (1988). This publication defined the goal of the library media program as ensuring that students and staff are effective users of ideas and information (AASL & AECT, 1988, p. 1).

Eisenberg, Lowe, and Spitzer (2004) asserts that all alternative definitions of information literacy likely stem from this one offered by the *American Library Association's (ALA) Presidential Committee on Information Literacy, Final Report* (1989): "To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (p.1).

Since information formats include more than just the printed work, some assert that other literacies—visual, media, computer, network, and basic literacies—are implicit in this definition of information literacy (Plotnik, 1999). Kulthau's work (1991) highlighted the need to teach information skills in the context of a process that is designed around the user's natural patterns of information seeking. Kulthau (1991) further stated that the process of learning from information is at the core of an

information literacy program (as cited in Taylor, 2006). The American Association of School Librarians (AASL) and the Association for Educational Communications and Technology (AECT) identified the goal of the information skills curriculum as the cognitive development of young adolescents through their engagement in more sophisticated research and problem solving than in the past (AASL 1998). Doyle (1994) included the use of information in critical thinking and problem solving in the definition of an information literate person. Shapiro and Hughes (1996) introduced the idea that information literacy should be conceived as a new liberal art that includes:

critical reflection on the nature of information itself, its technical infrastructure, and its social, cultural, and even philosophical context and impact – as essential to the mental framework of the educated information-age citizen as the trivium of basic liberal arts (grammar, logic, and rhetoric) was to the educated person in medieval society. (p.3)

In summary, definitions of information literacy have evolved over the years. Therefore, a school, school district, or state department of education facing the intellectual and practical challenges of developing and implementing curriculum for information literacy

education will need to clarify and communicate their definition that is at the heart of the particular program they are implementing.

Information Literacy Standards and Technology Standards

Literature and research in the field of library science over the past couple of decades has included ideas and perspectives on how best to promote and implement information literacy education and school library programs. One perspective that has influenced information literacy education is the overlapping or close relationship of information literacy skills and knowledge to those of technology skills and knowledge. In 1998, the American Library Association (ALA) and The Association for Educational Communications and Technology jointly introduced a set of nine information standards for student learning (ALA, 1998). Known as *The National Information Literacy Standards for Student Learning*, these standards describe what students should know and be able to do to become information literate and were organized around three categories:

Information Literacy

1. Access information efficiently and effectively.
2. Evaluate information critically and competently.
3. Use information effectively and creatively.

Independent Learning

4. Pursue information related to personal interest.
5. Appreciate and enjoy literature and other creative expressions of information.
6. Strive for excellence in information-seeking and knowledge generation

Social Responsibility

7. Contribute positively to the learning community and to society by recognizing the importance of information to a democratic society.
8. Contribute positively to the learning community and to society by practicing ethical behavior in regard to information and information technology.
9. Contribute positively to the learning community and to society by participating effectively in groups to pursue and generate information.

These standards are arguably the most widely accepted and used standards as the basis for curriculum development in the area of information literacy. However, they are not the only ones to influence information literacy program development.

In 2000, the National Educational Technology Standards (NETS) for PreK-12 students were developed by the International Society for Technology in Education (ISTE), in partnership with—among others—the American Association of School

Librarians (AASL), American Federation of Teachers (AFT), Association for Supervision and Curriculum Development (ASCD), Apple Computer, the Milken Exchange on Education, and the U.S. Department of Education (USDE). These standards were divided into six broad categories:

1. Basic operations and concepts.
2. Social, ethical, and human issues.
3. Technology productivity tools.
4. Technology communications tools.
5. Technology research tools.
6. Technology problem-solving and decision-making tools.

Standard five, technology research tools, was particularly relevant to information literacy,

Recently, both professional organizations updated and released revised standards for student learning. The International Society for Technology Education (ISTE) published a revised set of standards called *ISTE's Educational Technology Standards for Students* (2007). These standards include the following six broad categories:

1. Creativity and innovation.
2. Communication and collaboration.
3. Research and information fluency.

4. Critical thinking, problem-solving, and decision-making.
5. Digital citizenship.
6. Technology operations and concepts.

The American Association of School Librarians (AASL) introduced a set of revised standards at its annual conference in the fall of 2007 (American Association of School Librarians (AASL), 2007). The document introducing the standards included a set of common beliefs and four broad categories that are framed within the statement, Learners use skills, resources, & tools to: (1) inquire, think critically, and gain knowledge; (2) draw conclusions, make informed decisions, apply knowledge to new situation, and create new knowledge; (3) Share knowledge and participate ethically and productively as members of our democratic society; and (4) Pursue personal and aesthetic growth.

The two perspectives represented by the standards from ALA and ISTE are considered the two primary influences guiding efforts by state departments of education in the development of curriculum and programs related to information literacy and associated technologies (Sutton, n.d.). In fact, many state departments of education are addressing technology skills instruction in the context of information literacy standards (Eisenberg, Lowe, & Spitzer, 2004; Sutton, n.d.). A few examples include: Oregon which incorporated technology standards with information literacy standards (Fulton, 1997, as

cited in Eisenberg, Lowe, & Spitzer, 2004); Illinois, where the language of the technology standards incorporates such language as *information seekers, selectors of information, and creators of knowledge using information resources*; and California which incorporated technology skills in the context of information literacy standards through the California Technology Assistance Project (CTAP) (Eisenberg, Lowe, & Spitzer, 2004). Eisenberg, Lowe, and Spitzer (2004) say that “information technology integrated into the curriculum can enhance the development of students’ information literacy skills” (p. 167).

According to Fullan (2001b) effective implementation is a process of clarification in which the essential features of an innovation need to be identified in order for the change to be successful. To develop and implement information literacy curriculum, decisions will need to be clarified at the local, school level as to which standards will be used to guide the program. The degree to which a school, school district, or state department of education integrates information literacy with information technology—along with other curricular standards—is something that will also need to be considered (Taylor, 2006).

Logically then, if evidence exists in a school to show that the school has identified a working definition of information literacy and has identified standards or outcomes for

learning, then there is evidence that program development and implementation are occurring or likely to occur.

Information Literacy: A Recognized Educational Need

The literature supports the idea that in the process of implementing or improving instruction, there must be recognition of a need for the program or the skills and knowledge that are imparted through the program (Berends, Kirby, Naftel, & McKelvey, 2001; Fullan, 1998). Fullan (1998) calls this *moral purpose* which he says is related to both the ends and the means. When talking about the role of moral purpose in leading a change initiative, Fullan describes the need to energize people to pursue a desired goal.

Information literacy has gained a great deal of recognition as an educational need at the national, state, and regional levels in the United States and among many other countries (Eisenberg, Lowe, and Spitzer, 2004). A seminal event for launching national recognition occurred in 1987 when the American Library Association (ALA) Presidential Committee on Information Literacy produced a document that defined information literacy and “asserted that information literacy was a necessary skill for everyday life, for the business world, and for democracy” (Eisenberg, Lowe, & Spitzer, 2004). Since that time, and based on recommendations of the Presidential Committee, the National Forum on Information Literacy (NFIL) was formed. Consisting of more than 65 national

organizations from business, government, and education, the NFIL has worked to promote the concept of information literacy as an imperative for the Information Age among all professions. An accreditation agency, the Commission on Higher Education (CHE), joined the National Forum on Information Literacy (NFIL) and developed a standard on information literacy in 1994. The Association of College and Research Libraries (ACRL) published *Information Literacy Competency Standards for Higher Education* (2000) as a guide for integration of information literacy skills across the curriculum. The American Library Association of School Librarians (AASL) published *Information Power: Guidelines for School Library Media Specialists* (1987), a “powerful tool that can have a profound influence at the district, building, and classroom level” (Eisenberg, Lowe, & Spitzer, 2004, p. 23). In other words, this document is designed to support the library media specialist in establishing recognition of the need for information literacy teaching and learning at the local level.

Issues of Receptivity for Implementation

Program Goals and Implementation

For implementation to occur there must be clarity about the suggested change or innovation that is the focus of the change process (Fullan, 2001b). A lack of clarity about

the essential elements of the innovation will be problematic for teachers who “find that the change is simply not very clear as to what it means in practice” (Fullan, 2001b, p. 77).

The importance of identified goals for effective implementation is clear in the literature on school improvement:

We have what is perhaps the most striking, contradictory, self-defeating characteristic of schooling and our efforts to improve it: the gap between the need—and intent—to improve academic performance in our schools on the one hand, and the conspicuous and virtual absence of clear, concrete academic goals in most school or district planning efforts on the other. Without explicit learning goals, we are simply not set up and organized for improvement, for results. Only such goals will allow us to analyze, monitor, and adjust practice toward improvement. (Schmoker, 1999)

In addition to providing valuable information about what is working or not working in the implementation process, goals also tell schools and teachers “how they should gauge their performance success” (Rosenholtz, 1991, p. 5). The goals must be specific, however, or one risks creating what Fullan (1991) describes as “false clarity”—the erroneous belief that we understand and know how to work toward achieving the goals (pp. 34-35). Schmoker (1999) argues that “specific goals are the most vital

ingredient of purpose (p. 27). Rosenholtz (1989) cites a number of additional reasons

why specificity is crucial in goals:

- Specific goals convey a message directly to teachers that they are capable of improvement.
- Specific goals provide a basis for rational decision making, for ways to organize and execute instruction and promote professional dialogue.
- Specific goals promote professional dialogue.

Collaboration as a Condition of Implementation

The desire for change within education is often guided by powerful ideas, but only rarely is attention paid to the need to build the capacity [that is needed] to implement those ideas” (Harris, 2001, p. 261). Building the capacity of a school for change requires the establishment of conditions, opportunities, and experiences for collaboration and mutual learning (Harris, 2001). The suggestion that collaboration is important for implementation of information literacy curriculum is well documented in the literature (Hurren, 1999; Loertscher & Achterman, 2002; Oberg, 1999a; Page, 1999). The American Association of School Librarians (AASL) (1998) suggested an approach for program implementation in *Information Power: Building Partnerships for Learning* that included: collaboration, leadership, and technology. Since the publication of *Information*

Power, there has been much discussion on the importance of collaboration, particularly between teachers and librarians, for effective implementation of an information literacy curriculum. In a number of studies that identified aspects of school culture that influence effective implementation, teachers and librarians rated collaboration as high (Asselin, 2005; Kuhlthau, 1999; Zweizig & Hopkins, 1999). Haycock (1998) describes the collaborative relationship between teacher and librarian as “a strategy or approach to teaching and learning...a philosophical framework for the development and implementation of resource-based programs that reflect what we know about how students learn” (p. 29) Haycock (1999) calls the collaborative relationship “cooperative program planning and teaching” and states that “where the school fosters and supports collaborative work environments the role of the teacher-librarian is more easily achieved” (p. 17). Nancy Everhart’s evaluation model of the school library media center includes a self-assessment on the librarian’s role in the instructional design process so that the librarian can “increase time available for meeting with teachers” (Everhart, 1998, p. 50). Loertscher and Woolls (2002) describe the value of collaboration this way:

When flour, sugar, chocolate and other ingredients collaborate properly, the result is chocolate cake. Likewise true collaboration produces an amalgamation of

content, technology skills, and information literacy to produce an exciting learning experience coached by a teacher / library media specialist team. (p. 77)

Taylor (2006) describes collaboration as the framework for integrating information literacy skills with other curricula, but cautions that collaboration requires “shared goals and a shared vision, as well as a climate of trust between library media specialist and the teachers. Principals, teachers, and library media specialists all must understand collaboration and team teaching” (p. 49)

Constructivism and Process Learning

Information literacy program implementation involves more than identifying a set of standards or teaching objectives and then working collaboratively to teach to those standards or objectives. A number of inter-related factors affect implementation of an information literacy program: research as a process; integration of standards across the curriculum or within a context; and authentic or “real world” applications.

Carol Kuhlthau, an early researcher in the information search process, found that there is a natural inquiry process that matches children’s developmental stages and their need for information (Kuhlthau, 1991). Kuhlthau’s work suggested that a sequence of information skills—a research process—needed to be developed and used that is consistent with children’s development stages (as cited in Taylor, 2006). The American

Association of School Librarians (ASL) published a position statement that identified the steps of the information problem-solving process as the key elements of an information literacy curriculum (as cited in Eisenberg, Lowe, and Spitzer, 2004).

Multiple research models exist that define the information-seeking process, including but not limited to: Kuhlthau's (1997) Information Search Process (ISP); Eisenberg and Berkowitz's (2000) Big Six Skills; Stripling and Pitt's (1988) REACTS and Term Paper Models; Joyce and Tallman's (2006) I-Search Model; Pappas (2000) and Tepe's Pathway to Knowledge; and Yucht's (2000) Flip-It! Model. Research and literature in the field has demonstrated some of the benefits of these models to student learning (Doiron & Davies, 1998 as cited in Eisenberg, Lowe, and Spitzer, 2004), yet no study has been able to show that one method is superior over another (Eisenberg & Brown, 1992, as cited in Eisenberg, Lowe, and Spitzer, 2004). The models vary in vocabulary, emphasis, and complexity, yet "each of the models assumes learning as an active and creative process, and each promotes the development of critical thinking skills" (Thomas, 2000).

Kuhlthau's work also introduced the idea that library skills are a "proficiency in inquiry," not reserved for the library alone. Her work "pointed the way to the integration of information literacy with [content] curriculum" (Eisenberg, Lowe, and Spitzer, 2004,

p. 18). Eisenberg (2004) stresses both integration and opportunities for practice when he states that “for students to be successful in the Information Age, information literacy skills must be integrated throughout the curriculum, as well as being reinforced outside of school (p. 55).

Newmann and Wehlage (1993) stress the importance of authentic learning where “students used disciplined inquiry to construct meaning” (p. 8). Through authentic learning, students’ work has value or meaning that goes beyond success in school.

Schack (1993) states that the value of authentic research is in the messages it teaches students: (1) that “their questions and interests matter”; (2) that “they have the skill and ability to pursue their interests”; and (3) that “their work has value in the real world”

(p. 31). Keegan and Westerberg (1991) describe the philosophy of education in the Information Age as “resource-based” learning as opposed to content-based learning. The authors assert that libraries are made to order for the information age because “library information is more akin to that which our graduates will encounter in the real world” (p.

11). In summary, the literature suggests that well-developed information literacy curriculum includes authentic tasks dealing with real-world problems.

Assessments as an indicator of Implementation

The literature describes a number of ways in which assessments and assessment data support program implementation. In the literature, the terms feedback and results are synonymous with assessments.

Assessments measure the results of an innovation, but Schmoker (1999) describes an interdependent relationship between the process of implementation and results: “Results tell us which processes are most effective and to what extent and where processes need reexamining and adjusting (p.4). He states that “regular monitoring, followed by adjustment, is the only way to expect success (p.5):

Data are to goals what signposts are to travelers: data are not end points, but are essential to reaching them—the signposts on the road to school improvement.

Thus, data and feedback are interchangeable and should be an essential feature of how schools do business. (Schmoker, 1999, p. 36)

Assessments are also used to sustain interest and momentum. Assessments, particularly short-term results, “act as vital feedback and provide encouragement and momentum toward continued improvement” (Schaffer and Thomson, 1992 as cited in Schmoker 1999, p.5). Long-term—or sustained change—relies on “immediate successes”

which are “essential if people are to increase their confidence and expand their vision of what is possible” (Schaffer 1988 as cited in Schmoker 1999, p.5).

Literature in the field of education includes discussion and research about assessment and the role of assessment in instructional design, student learning, and program evaluation (Frey & Schmitt, 2007; Madaus & O’Dwyer, 1999; Newmann, Brandt, & Wiggins 1998; Thornton, 2008). Wiggins (1997), a researcher in instructional design, states that “the purpose of assessment is to find out what each student is able to do, with knowledge, in context” (p. 19). Assessments of information literacy knowledge and skills are an important component of an information literacy program and the collaborative process (AASL, 1998; Austrom, 1999; Eisenberg, Lowe, & Spitzer, 2004; Page, 1999; Joyce, 2006).

It is important that assessments be appropriate to the task; that is, if expectations for student learning are based on process learning and authentic tasks, then the assessments of that learning should reflect that learning. Some researchers describe these assessments as performance-based and authentic (Schack, 1993). A “performance assessment requires examinees to construct/supply answers, perform or produce something for evaluation” (Madaus & O’Dwyer, 1999, p. 689). Authentic assessments are “tasks that pose questions, problems, and issues to students that have some meaning

or value beyond achieving success in school” (Newmann, Brandt, & Wiggins, 1998, p. 19). Newmann includes this “real world” dimension in his description of authentic assessment. According to Neumann, the two other dimensions required for a task to be “authentic” are that the assessment must include a “construction of knowledge” and “disciplined inquiry” as (p. 19). There is a lack of consensus in the literature about the meaning and distinction between *performance assessment* and *authentic assessment*, but both terms are used in the literature in relation to information literacy assessment.

However, “a key challenge to designing and implementing effective information literacy instruction is the development of reliable and valid assessments” (Katz, 2007, p. 3) The iSkills assessment developed by the Education Testing Service (ETS) measures seven information and technology performance areas through simulation-based tasks (Katz, 2007). The test was developed in response to a recommendation by the International ICT Literacy Panel 2002 who recognized the importance of determining the current status of students’ technical and cognitive skills related to information and communications technology (Katz, 2007). A variety of other assessments are identified in the literature as appropriate for measuring information literacy skills and knowledge and that act as an alternative to the traditional pencil and paper test. These include but are not limited to: self-evaluation, observing and conferencing, logs, portfolios, rubrics, and

student initiatives or performances (Taylor, 2006). Assessments are also important for evaluating school library media instruction and for modifying or improving the program (AASL, 1998; Everhart, 1998; National Study of School Evaluation, 1998; Seymour, 2007; Taylor, 2006; Thomas, 1999).

School Culture and Program Implementation

Major changes have been attempted at the school level with only modest resources and commitment (Fullan, 2001b). The result is that many well-intentioned school programs and initiatives have floundered or failed (Sarason, 1990). To build a school capacity implies that the school promotes collaboration, empowerment, and inclusion (Harris, 2001). It implies that individuals “feel confident in their own capacity, in the capacity of their colleagues and in the capacity of the school to promote professional development” (Mitchell & Sackney 2000, p78). In other words, for change to occur, the systems within the school must be structured in a way that allow for change to occur (Deal & Peterson, 1999 as cited in George, White, & Schlaffer, 2007). In addition, effective support from outside is required to build internal capacity and is a prerequisite of successful school improvement (West, 2000). This “system’s perspective” is the key to creating lasting change because schools operate as living systems where changes in one part affect another (Senge et al., 2000 as cited in Harris, 2006)

There is recognition within the field of library science as well that the culture and organization of the school must support implementation for it to occur. Oberg (1999b) argues that the approach to program implementation needs to include a greater consideration of the conditions within the school that support the kinds of change that program implementation imply. She asserts that “we have not looked closely enough at the context within which these changes are being made” (p. 41). Others in the field have identified various conditions considered essential for information literacy program implementation including but not limited to: collaboration (ALA, 1998; Montiel-Overall, 2005; Page, 1999), flexible scheduling (Loertscher & Woolls, 1999; van Deusen & Donham, 1995), administrative support (Oberg, Hay, & Henri, 2000; Taylor, 2006; Todd, 1999); and professional development. (Asselin & Naslund, 2000; Moore, 2005;)

Professional Development in Program Implementation

A goal and potential product of professional development is that it fosters collegiality and teamwork, two important characteristics of successful implementation:

Collegiality among teachers, as measured by the frequency of communication, mutual support, help, etc., was a strong indicator of implementation success.

Virtually every research study on the topic has found this to be the case. (Fullan, 1991, p. 132).

Schmoker (1999) draws a distinction between schools that merely adopt innovations and those that improve. The latter requires the application of certain basic principles:

People accomplish more together than in isolation; regular, collective dialogue about an agreed-upon focus sustains commitment and feeds purpose; effort thrives on concrete evidence of progress; and teachers learn best from other teachers. (p. 55)

Program Support & Evaluation in Implementation

The importance of administrative commitment and support in implementation—including adequate funding and facilitation of the change process—is clear in the literature.

For example, research has shown that the role of the administration, particularly the principal, influences the likelihood of successful change (Berends, Kirby, Naftel, & McKelvey, 2001; Fullan, 1991). Schmoker (1999) sees the role of the principal as that of providing direction: “Schools improve when purpose and effort unite. One key is leadership that recognizes its most vital function: to keep everyone’s eyes on the prize of improved student learning” (p. 111). This can be difficult with the crush of competing agendas and daily distractions, but principals and other leaders “have a responsibility to reinforce individuals and collective effort” (p. 112).

Leaders in the school must also provide specific, improvement-focused collaboration to discuss technical, logistical, or attitudinal problems when working toward school improvement (Schmoker, 1999). The concerns-based model describes this stage as the one in which an “individual is uncertain about the demand of the innovation, his/her inadequacy to meet those demands, and his/her role with the innovation” (Hall & Hord, 1987, p. 60 in Salvaterra and Adams, 1998, p. 10). At this stage in the change process, personal concerns may arise about the impact of the program on the individual life of the teacher that needs to be addressed.

Of course, teacher leadership is important to implementation of an innovation as well. The NAS model for school improvement is emphatic about the importance of teacher support: “Without willing and able teachers who embrace reform and provide the necessary leadership, no reform can be enacted, no matter how effective it may be” (Berends, Kirby, Naftel, and McKelvey, 2001, p.18). Principals and other administrators need to provide support to teacher leaders. “Change has a much better chance of going forward when principals team up with teachers who help to translate and negotiate new practices with the faculty” (Schmoker, 1999, p.116).

Finally, an innovation or change in the educational program requires management of materials and resources, including time, curriculum documents, and other support

materials. Schmoker asserts that it is the responsibility of the school or district leadership to “coordinate the optimal use of funding and time—including summertime and intersession breaks—toward continuous learning and improvement (Schmoker, 1999). In their study of innovations in teaching, Hall, Hord, and Griffin (1980) conclude that the degree of implementation of the innovation is different in different schools because of the actions and concerns of principals (as cited in Berends, Kirby, Naftel, and McKelvey, 2001). Berends posits that the most effective influence may be in the form of providing sufficient resources to implement change.

Role of the Implementer in the Change Process

One of the areas I was interested in researching in the literature was the role of the implementer in the change process. I was specifically interested in two areas related to the implementers of an innovation: (1) an analysis of, or report on, the effectiveness of grassroots efforts in educational change since librarians—grassroots implementers—are often the primary implementer of an information literacy program in a school, and (2) an analysis of, or report on, the origins of successful innovations or initiatives. In other words, where do innovations that become successfully implemented programs in a school originate? Fullan (2001b) argues that “change is and will always be initiated from a variety of different sources and combination of sources” (p. 65), the literature does not

yield a further explanation of what those sources might be. The role of the implementer(s) was discussed in the literature on implementation, generally in terms of the kinds of activities and behavior that were needed for successful implementation.

In noting characteristics of successful implementation, Pankake (1998, as cited in McNamara, Erlandson, & McNamara, 1999) identifies the role of the implementer as inspirational; successful implementation requires “a common belief by implementers that the project or program is both useful to do and able to be done” (p. 172). Hall and Hord (1986) identify change facilitator styles—initiators, managers, and responders—that they define using specific behavioral indicators. In their work, Hall and Hord (1986) conclude that the style of the change facilitator—primarily the principal and secondarily other individuals or teams—had a significant impact on implementation: “Who these facilitators are, what they do, and how they interrelate provide important new insights about the change process” (p. 260). They add, however, that “the important consideration is what they *do* rather than who they *are*” (p. 262). ALA ((1998) defines what it is that school librarians can and should do to build school library information literacy programs: (1) collaborate with teachers to plan, conduct, and evaluate learning activities; (2) assume visible, proactive leadership roles in order to advocate for information literacy learning; (3) act as a technologist to integrate people, learning, and the tools of technology. More

recently it is the importance of a partnership between the principal and the school librarian that is recognized as optimal for implementation (Oberger, Hay & Henri, 2000; Todd, 1999; Wilson, Blake, & Lyders, 1999)

Existing Measures of Implementation

New American Schools

New American Schools (NAS), a private, non-profit organization, launched an effort for whole-school reform in 1991. Three years into the scale-up phase, NAS provided an interim report in which factors affecting implementation were identified and analyzed across a number of schools that were using a variety of different school improvement designs. In the report, Berends, Kirby, Naftel, & McKelvey (2001) identify four main categories of factors that affect implementation of whole school reform: (1) attributes of the change itself, in terms of need and relevance of the change, clarity, complexity, quality, and practicality of the program; (2) characteristics at the [local] level, including support and stability; (3) characteristics of the school, including leadership, peer relationships, and teacher characteristics and orientations; and (4) characteristics external to the local system such as the role of outsiders and external assistance (p.15). To measure implementation of these factors across a variety of designs, NAS developed what they call a “core implementation index,” or a common set of

indicators. The core implementation index used a summative scale of teacher responses as to the degree to which the set of indicators described their school.

Character Education: Degree of Implementation Scale

The next example comes from the field of character education where there are parallels in approach with information literacy. A character education program called CHARACTER*plus*® uses an approach that seeks to integrate character education into the mission, policies, professional development, and academic curricula at the local level, very much like information literacy. The CHARACTER*plus*® program is based on a process for development implemented through a set of factors that they call the Ten Essentials: (1) community participation; (2) character education policy; (3) identified and defined character traits; (4) integrated curriculum; (5) experiential learning; (6) evaluation; (7) adult role models; (8) staff development; (9) student leadership; and (10) sustaining the program (*Character Plus: School*, 2005). CHARACTER*plus*® is then implemented through high quality staff development and coaching. The CHARACTER*plus*® Implementation Survey consists of thirty-three questions in which the staff identify the level to which each of the attributes have been implemented in the school (on a 5- point scale with a range from *Not Evident* to *Exemplary*).

Concerns-Based Adoption Model (CBAM)

The third model for measurement of implementation is the Concerns Based Adoption Model (CBAM). CBAM provides “an organized approach to assessing where people stand as they learn about, and accept, changes in organizations (Fenton, 2002). The CBAM model examines three distinct areas: (1) Stages of Concern which describes how people feel about change; (2) Levels of Use which describes what people are doing in relation to the change; and (3) Innovation Configurations which are the ways in which the innovation has been adapted to a particular setting or situation. When measuring implementation using the CBAM approach, a combination of questionnaire, interviews, and mapping techniques is used. For instance, there are seven Stages of Concern and they are measured using a summative scale of participants’ responses in which they identify their present concerns or feelings about an innovation. There are eight Levels of Use identified by the CBAM model, and the CBAM model measures those using structured interviewing techniques. This model—the theoretical concepts of the CBAM model and the defined stages within the Stages of Concern and Levels of Use—provide the framework for some of the questions having to do with self-assessment of cognitive and behavioral evidence of implementation for this study.

Chapter 3

RESEARCH DESIGN AND METHODOLOGY

The Delphi Method

The general methodological approach utilized in the first part of this study—the identification of those factors that influence implementation of an Information Literacy Program—is the Delphi. The Delphi technique is a well-recognized tool in the social sciences for gathering, structuring, and organizing expert opinions (Powell, 2003). This technique involves “a series of sequential questionnaires or ‘rounds’, interspersed by controlled feedback, that seek to gain the most reliable consensus of opinion of a group of experts” (Delbecq et al., 1975 as cited by Powell, 2003, p.376). I used these guiding principals associated with Delphi to assist me in structuring and organizing the expert group’s communication regarding these implementation factors. I provided an initial set of data from the literature review as a starting point for expert-group feedback. Each round included additional or new information as well as the feedback from the previous round.

Goals of the Delphi

There were three goals associated with the Delphi phase of the study. The first goal was to identify a list of implementation factors or conditions—hereafter referred to as simply *dimensions of implementation*—that need to exist for an information literacy program to be fully implemented. The assumption is that when fully implemented, an information literacy program would be, in Haycock’s words, “an integral, essential part of the fabric of the school” (1998). Using a semi-structured approach to the Delphi, I began the first round by introducing an initial list of dimensions of implementation—identified through the lit review—that potentially influence implementation of an Information Literacy Program.⁴ I looked to the literature on information literacy programs, school improvement, and educational program implementation to help me generate the initial list of implementation factors. The goal was to identify dimensions that would answer the question: what conditions need to exist in a school or learning community in order for an information literacy program to be considered an integral, essential part of the fabric of the school?

⁴ The factors that influence implementation of any educational program are quite varied and may include a wide range of influential factors. Some examples include: funding, administrative support, professional expertise, school culture, etc.

The second goal of the Delphi phase of the study was to identify—through group consensus or a general convergence of thinking—those behaviors or conditions that serve to describe or operationalize the list of implementation factors. Since implementation dimensions cannot be observed directly, they must be measured in terms of behaviors or conditions associated with them. As such Delphi was used to help the group to generate and agree upon those behaviors and/or conditions that they believe show evidence of implementation. To begin Round Two of the Delphi, an initial set of behaviors and conditions associated with each dimension were generated from a review of the literature. These sets of behaviors and conditions were distributed to the expert group in the second round of the Delphi as a starting point from which to base their input.

The third goal of the Delphi was to identify a number of school characteristics or contextual factors that the expert group thinks may account for differences among schools in implementation of an information literacy program. These identified contextual factors were used to define the demographic questions that were included in the instrument. The expert group was asked to identify not only those contextual factors that are thought to be critical to school improvement and program development in general, but also to identify contextual factors that may be specific to information literacy

program development. Discussion and consensus around contextual factors and demographics occurred in both rounds of the Delphi.

Expert Group Selection

Linstone and Turoff (1975) suggest that interest and involvement in the study will be greater if the make-up of the expert group represents a diversity of viewpoints (as cited in Powell, 2003). For this reason one goal for expert selection for this study was to balance the expert group with librarians, both practitioners and academics from the field of school library science, and other educators who have knowledge of program development, including curriculum developers and principals. The goal was to have as much diversity as possible since, according to Rowe (1994) and Murphy et al (1998), diversity of the expert group guarantees a wider base of knowledge and leads to better performance respectively (as cited in Powell, 2003). These were the main criteria for identification of the expert group.

For my study, I defined a qualified expert as someone who has had extensive professional experience in their field of school library science or in the field of leadership in education. There was no one single criterion upon which I chose any single individual. Instead, experts were chosen on the sum of the experience that they represented as well as for their willingness to be involved in the study. Evidence used to establish someone as

an expert included but was not limited to: number of years of experience; supervisory or leadership role in his or her field; recommendation of others; research or publications in his/her field; past and current involvement in school library program development; and knowledge of or experience with school library program development. During the Delphi rounds each participant was identified only by a unique number which was used for mailing and communication purposes as explained in the introductory letter (Appendix B).

The expert group was comprised of the following individuals: (1) a director of library services from a large U.S. school district; (2) an education program consultant and information management specialist from a state department of education and department of School Improvement and Accreditation; (3) a credentialed and former library practitioner currently in the position of editor for a major publication for school library media specialists; (4) a practicing international-school, library media specialist; (5) an associate professor and coordinator of the school library media program in the college of information studies at a major university; and (6) a former school principal and superintendent who is currently the director of a principal's training center for international leadership. Table 1 summarizes the experience and professional background of the experts.

Table 1: *Experts' professional experience and background*

ID	Contributing Expertise on the Delphi	Unique Contribution / Perspective
1787	<ul style="list-style-type: none"> • From field of educational leadership. • Knowledge of principal training and education. • International school experience and background. • Knowledge of general curriculum development. • Former principal and school head. • Published in field of educational leadership. • 20+ Years of experience: 	<ul style="list-style-type: none"> • Administrative / principal perspective on general program development and implementation. • International school perspective.
5857	<ul style="list-style-type: none"> • From field of school library science. • District coordinator of librarians. • Currently supervising and supporting school library program implementation. • Former school librarian. • 35+ Years of experience 	<ul style="list-style-type: none"> • District coordinator perspective on information literacy program development and implementation.
8984	<ul style="list-style-type: none"> • From field of school library science. • Knowledge of State Department of Education IL program development. 	<ul style="list-style-type: none"> • State Dept. of Education perspective on information literacy program development

Table 1 (con't)

	<ul style="list-style-type: none"> • Knowledge of assessment and reporting of IL program development. • PhD in Education. • 20+ Years of experience. 	and implementation.
3261	<ul style="list-style-type: none"> • From field of school library science. • Intl. School Practitioner. • Currently implementing information literacy program in a school. • 20+ Years of experience. 	<ul style="list-style-type: none"> • Practitioner (school librarian) perspective on information literacy program development and implementation. • International school perspective.
4831	<ul style="list-style-type: none"> • From field of school library science. • Academic in field of library science. • Ph.D. in Education. • National level advocacy in school library program development and implementation. • Extensive research and publishing in school library program development and implementation. • 30+ Years of experience in education / instructional design / library science: 	<ul style="list-style-type: none"> • Academic perspective on information literacy program development and implementation. • Historical perspective on information literacy advocacy and program implementation.

Table 1 (con't)

2745	<ul style="list-style-type: none"> • From the field of school library science. • Editor of school library-related publications. • Former school librarian and coordinator. • 25+ Years of experience as educator / librarian. 	<ul style="list-style-type: none"> • Practitioner and coordinator perspective on information literacy program development and implementation. • Publisher perspective: exposure to trends in thinking and practice by school librarians who submit articles for publication.
------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

I felt satisfied that the expert group represented multiple perspectives related to program development and implementation and that each person had extensive knowledge and expertise from which to offer their opinions and views.

Data Collection

Data Collection: Round One

There is disagreement in the literature as to the recommended structure of the first round. In a traditional Delphi, Round One includes open-ended questions that generate ideas and allow participants complete freedom in their responses (Hasson, 2000). Other studies (Duffield, 1993, Jerkins & Smith, 1994) have revised the approach to provide more structure by presenting an initial set of ideas or questions to which the participants

are asked to respond (as cited in Hasson, 2000). In this study, I conducted what I consider a modified Delphi, limiting the Delphi to two rounds with six participants. For this reason, I approached Round One with pre-existing, structured questions to which I asked the participants to respond. To ensure that I didn't limit the participants' opinions, I included opportunities for open-ended comments within each question or section.

Prior to the beginning of Round One, I sent an introductory email letter to each member of the expert group. The letter informed the participants of the study and set a date on which the first round was expected to be mailed. It described the Delphi process and asked each member to take a personal interest in the study. The letter asked participants to reply to the email in order to reaffirm their interest in and availability to participate.

To begin data collection for Round One of the Delphi, I sent an introductory letter in the body of an email message to each of the experts (Appendix A) The letter included a statement of appreciation for the expert's participation, an identification number for the expert to use when completing the Round One questionnaire, a set of instructions for completing the Round One questionnaire, a URL link to the questionnaire on the Zoomerang site, and directions for completing *Informed Consent* (Appendix C), which was sent as an attachment to the email. Participants were asked to acknowledge informed

consent by responding electronically using “buttons” at the top of the email that stated they either “read and consent” or “read and did not consent.”

The Round One questionnaire was completed by accessing the survey at an online survey service, Zoomerang (Market Tools, Inc, 1999-2007). As stated above, the cover letter included a URL link to the survey which was read and completed electronically. The results of the survey were stored electronically where they could be accessed by the researcher at any time.

The goal of the Round One questionnaire was to identify—in the opinions of the experts—dimensions of implementation and demographics that may account for differences in implementation among schools. The questionnaire (Appendix D) presented the experts with a variety of dimensions that might be considered important for measuring implementation of an information literacy program. The expert-group participants were asked to rate—in their opinion and using a five-point, Likert-type scale—the degree to which each of these implementation factors was relevant to or a condition of implementation of an information literacy program. For easy review each question was preceded by a definition of the implementation factor that the question was designed to represent. In addition, the expert-group participants were asked to suggest—in open-ended responses—other implementation factors and/or potential questions to be

included in future rounds. These open-ended responses enriched the data by allowing the experts to contribute information that was not directly included in the questionnaire.

In addition to the questions on implementation factors, the participants were asked to identify those demographics that they felt might explain differences among schools in the implementation of an information literacy program and to make any additional comments in an open-ended response.

Table 2. *Questions included in Round One of the Delphi phase of the study*

1. How important is community investment when implementing an information literacy program?
2. How important is information literacy policy when implementing of an information literacy program?
3. How important are identified and defined outcomes when implementing an information literacy program?
4. How important is an integrated curriculum when implementing an information literacy program?
5. How important is experiential learning when implementing an information literacy program?
6. How important is assessment when implementing an information literacy program?
7. How important are adult role models when implementing an information literacy program?

Table 2 (con't)

8. How important is staff development when implementing an information literacy program?
9. How important is student involvement and leadership when implementing an information literacy program?
10. How important is program support and evaluation when implementing an information literacy program?
11. How important are each of the following library or librarian characteristics when implementing an information literacy program? <ol style="list-style-type: none">a. The librarian's level of awareness of or interest in information literacy program development?b. The librarian's knowledge or experience with information literacy?c. The librarian's sense of being able to manage an information literacy program?d. An organizational structure (schedule, space, etc.) to manage and organize an information literacy program?e. A school or librarian's focus on the impact of information literacy education on student performance?f. The degree to which the librarian is cooperating and collaborating with others on information literacy?g. Adapting the innovation to meet the needs of his/her particular school, culture, or institution?

Table 2 (con't)

12. Assuming the librarian is the "user" of information literacy programs , how important is the librarian's level of use for measuring implementation of an information literacy program?
13. How important is it to know the innovations that are being used when measuring implementation of an information literacy program?
14. What demographic information (if any) should be collected that might explain differences among schools in the degree of implementation of an information literacy program?

The first round took longer to complete than anticipated. The Delphi was launched toward the end of April 2007 and completed by six participants toward the end of August 2007. One reason for the delay is simply that participants working in the field of education were very busy during this time in the school year. In addition, a number of technical difficulties came to light during this time that caused delays and required adjustments in methods of communication. For instance, after a number of non-responses to follow-up emails after the launch, I discovered that two participants with whom I had had previous email communication were not now able to receive my email communication. Through trial and error we surmised that in both cases the institutional security on communication systems did not allow email with attachments from foreign addresses. I had to change the email account from which I communicated with the

participants. Another delay was caused by one participant who had technical difficulty completing the survey and then went on sabbatical during the process. I had to replace that participant which took additional time given that we were then into the summer months. In the end six participants completed the Round One questionnaire. As the results were received, participants received thank you emails and an expected timeline for distribution of the follow-up to Round One.

Follow-up communication to Round One was sent via email when all the responses were in. The goal of the follow-up was to share all the Round One results with the participants so that they could see how the other experts responded to the questions. Additionally, each expert could then modify his or her own answers if he or she wished to. This is consistent with the ultimate goal of the Delphi which is to try to create consensus or a convergence of opinion around the questions asked and topics discussed.

To make it easy for participants to view their responses in the context of the other responses, I sent them two documents as attachments in the Round One follow up email (Appendix E). One of the documents was a summary of the Round One results. The second was a unique document for each participant in which his or her Likert responses and any open-ended comments were highlighted. Participants were asked to compare their responses with that of the other experts and invited to modify their responses in a

space provided. This second document also contained some new ideas on demographics that were generated during Round One to which the experts were asked to respond. The follow-up to Round One was complete by mid-September 2007.

Data Collection: Round Two

The process for Round Two data collection was essentially the same as described above in Round One. Following an analysis of the data and follow-up from the first round, Round Two was introduced through email communication in mid-September 2007 (Appendix F and G). These brief emails included a statement that the second questionnaire would follow shortly, a reminder of the participant's individual identification number, an estimate of how long it would take to complete the questionnaire, and a brief description of the results of Round One, and brief instructions for completing Round Two.

The goal of the second round was to identify those behaviors that operationalized the dimensions of implementation identified in Round One. As in Round One, I used a structured approach to Round Two. In the second round questionnaire (Appendix H), I suggested a number of potential questions that could be used to measure or operationalize each dimension of implementation. The experts were asked to decide if the question was appropriate and relevant for measuring the dimension. This time, however, they were to

rank order the questions according to their importance for measuring the dimension.

Again, as in Round One, Round Two included open-ended responses for each question where the experts could include opinions and responses outside of the structure of the Round Two questionnaire.

The Round Two questionnaire was begun and invitations to complete the questionnaire were distributed in this round through the Zoomerang site itself in early September 2007. One week after beginning the second round, I emailed participants again to ensure they received the second-round questionnaire. This was followed up approximately every week until all responses were received or, again, it is clear that no other responses were forthcoming. I received all responses from all the participants. As in the first round, I sent acknowledgement emails for completed questionnaires.

Follow-up communication for Round Two was sent to the Delphi participants in mid-October. The email communication (Appendix I) included a letter of explanation of two documents--a summary of Round Two results and a supporting document that listed the full content of the questions that were retained and those that were eliminated as a result of Round Two (Appendix J). In particular, respondents were asked to look at one of the dimensions—#8 on Program Support and Evaluation—in which there was no clear consensus regarding which of the questions measure a dimension most accurately. They

were also asked to evaluate the potential answers for the three additional demographic questions that had been introduced in the first round and give some feedback on those. Finally, they were asked for additional comments and final thoughts on the instrument and Delphi. All responses for all members were collected by the end of October 2007. Thank you emails were sent, and Delphi participants were invited to request final results by responding to the email.

The Pilot Study

Participant Selection

Four individuals, none of whom had participated in the Delphi, completed a pilot of the draft instrument. These individuals were chosen because they represent different professional roles in the life of the school and in implementation of curriculum standards or educational programs: an administrator, a library-media specialist, a library-media coordinator, and a teacher. All of the participants come from the same grade-level division with the exception of the curriculum and library-media coordinators who are K-12 personnel but who are also connected to the grade-level division.

Data Collection: Pilot Study

To begin the pilot I sent a brief email to a number of colleagues with whom I have an established professional relationship. In the email communication I described the

study, gave an estimate of the time commitment, and asked each if he or she would be willing and able to participate in the pilot. As each replied, I delivered the survey and an informed consent form with instruction on how to complete each. I also set up a interview appointment with each. The pilot participants were able to complete the survey at their convenience.

The interviews were conducted at a set time with only the respondent and I present, but they were conducted informally using a set of open-ended guiding questions (Appendix K). In general I asked the respondents to be critical and assess the clarity, usefulness, and convenience of the instrument. To assess the general soundness of the instrument, I asked respondents if the questions were straightforward and if the format made sense. I used the pilot to assess two types of measurement validity: content validity and face validity. To assess content validity, I asked respondents if the instrument appears to cover the range of meanings of the topic, implementation of an information literacy program. To assess face validity, I asked respondents if the instrument appears to measure what it is designed to measure, implementation of an information literacy program. I also asked for any other impressions and observations, both positive and negative, in relation to the instrument. Four interviews were conducted and completed by

late November. An email was sent to each participant acknowledging his or her contribution to the study.

Survey Administration

Introduction

The survey is designed to provide information about the degree to which information literacy programs are implemented in a school. To test the instrument, I identified two different groups to target for survey administration. The first group I targeted for survey administration included only the librarians and library coordinators in a school district. Librarians and library coordinators are generally key implementers of an information literacy program in a school and are, therefore, likely to have first-hand knowledge of the dimensions of implementation. The second group I targeted for survey administration included the entire teaching faculty including the librarian, educational leaders, and administrators in a school. Given that implementation includes assessing the degree to which the innovation or program is systemic or integral to the school, it follows that teaching faculty, educational leaders, and administrators should be assessed for their knowledge of and experience with information literacy program development. The goal was to test the reliability of the instrument across these two different population groups.

Survey Participants

Using the draft instrument I surveyed five separate populations for the purpose of assessing the reliability and validity of the instrument: three of the populations were comprised of librarians only and two included all the teaching faculty and administration in a school. One of the librarian groups included the full population of elementary and junior high (or middle school) school librarians in a school district located in the Midwestern part of the United States. I focused on elementary and middle school or junior high school because those are the educational levels at which information literacy programs are more likely to be structured and supported. There were forty-four librarians in this population. A second group included the entire population of librarians in a district in a South-western state of the United States. Both populations are located in the United States where information literacy program development has been advocated and in development for a number of years, state standards have been established in most if not all of the states, and information literacy instruction is generally accepted as best practice in instructional standards.

A third population of librarians surveyed included all the members of a number of professional librarian listservs and other social networking tools whose purpose is professional dialogue among school librarians and others associated coordinators and academics from the field of library science. The listservs were both North America based

and international (English language), including among others: LM_Net, (North American), ECIS Smoodle (European), Oztl_Net (Australian), SILC-Asia (East and Southeast Asia), and IASL (International). Librarians who participated from these listservs self-selected to take the survey.

The fourth and fifth populations who were surveyed included all the teaching, support, and administrative professionals in two schools: one elementary—grades pre-K through five—and one middle school—grades six through eight. The two schools are associated in that they are two divisions of one K-12 international school located in East Asia. The upper school—grades nine through twelve—was not surveyed as I wanted to focus on divisions in which I expected information literacy program development to be more formalized.

Data Collection: Administration of the Survey

The general administration of the survey—timing and communications—followed recommendations by Salant and Dillman (1994) and is described in more detail below. I distributed the surveys to the two school populations—one lower and one middle school—through school email with a link to the survey located on Zoomerang, a web-based, survey site. I distributed the survey to the two populations of school librarians through email that was coordinated through their respective district coordinators. Again,

the survey was web-based on Zoomerang. I distributed the survey to the various listserv groups through postings on the listserv that included a link to survey on Zoomerang. In some cases the listserv guidelines required permission from the moderator before posting a survey. When that was the case, I obtained permission before posting (Appendix M).

Inasmuch as possible I introduced the survey the same for all groups except where directions for accessing the survey would be different. The email/posting included a brief introduction and a link to the survey (Appendix N). Information in the email/ posting included an introduction to the survey; a statement of why it was being done; a timeline for completion; an additional invitation to participate; and a communication of appreciation for participation in advance. It also included a link to the actual survey instrument which is how the participants are expected to access the survey instrument. To complete the survey, participants are asked to read and acknowledge the *Research Participant Consent Form* (Appendix O).

One week after the first instrument posting, a second listserv email/posting was submitted to each listserv. This posting thanked those respondents who had participated and reiterated to others an invitation to complete the survey. It included a request that participants respond by the intended deadline if they had not done so already. Additional emails/postings were sent until it was clear that few or no additional surveys were

forthcoming or, in one case, when the deadline was reached for returning surveys. At that point, the data were compiled for analysis.

Data Analysis: Factor Analysis and Item Analysis

To analyze the data, I conducted a factor analysis and item analysis on the survey data for questions #1-37. A factor analysis was used to identify the common underlying dimensions among the variables, known as factors (Hair, Anderson, Tatham, & Black, 1998, p. 112). The purpose of the factor analysis was to both summarize and reduce the data. In conducting a factor analysis, the factors were extracted using VARIMAX rotation, “one of the most popular orthogonal factor rotation methods” (Hair, Anderson, Tatham, & Black, 1998, p. 90) and one in which the correlation between factors is determined to be 0. For a factor to be retained in the survey, I set the criteria of a minimum of four items and an eigenvalue of at least 1. The eigenvalue represents the amount of variance accounted for by a factor (Hair, Anderson, Tatham, & Black, 1998). For items to be retained within a factor, the loading threshold was set at .35 based on the sample size need for significance (Hair, Anderson, Tatham, & Black, 1998).

An item analysis was conducted to evaluate the internal consistency of the instrument. Item means were analyzed to ensure that they did not tend to the extremes of the scales as the expectation on a 7-point scale is a mean closer to 4, the middle of the

range (DeVellis, 2003). In addition, corrected item-scale correlations were run; a *corrected* item-scale correlation means that each item was correlated to the total scale with the item itself eliminated. In addition, Cronbach's coefficient alpha was used to see the degree to which items were intercorrelated and a result of .7 was set for retention of single items; a generally acceptable value at the low end (as cited by DeVellis, 2003).

The data from questions #38-48 were analyzed using simple descriptive statistics and frequency distributions. Questions #40-48 formed a summative scale and, in addition to running correlations with the whole sample, the data were analyzed by splitting the two sample groups and running t-tests with the factors and four-factor scale for each of the two primary sample groups. Questions #49-55 included demographics which were analyzed by running a multiple comparisons, one-way ANOVA for each demographics with each of the four factors in the scale and against the combined four factors (ILIS). Significance was established at the $p = .05$ level.

Scoring the instrument included obtaining a weighted average for the four factors that comprised the scale represented in Section I: School Characteristics (questions #1-34). A weighted average was used since the number of items representing each factor varied: Factor One had 11 items; Factor Two had 8 items; Factor Three had 11 items; and

Factor Four had 4 items. Section II: Implementer Activities (questions #35-43) were scored by assigning numeric values to each answer and then adding the scores.

CHAPTER 4

FINDINGS OF THE STUDY: DATA ANALYSIS

The purpose of this study was to develop a valid and reliable instrument to measure implementation of information literacy programs in schools. Initial dimensions of the construct, implementation, were based on a review of the literature on school improvement or change, school program implementation, and information literacy program development. A Delphi study was used to further validate the dimensions, to develop specific items to be used in the survey, and to reduce the items to a manageable number for the instrument. Using a draft of the survey, a small pilot was conducted that contributed to the overall soundness and understandability of the instrument. The survey was then administered to groups of librarians and teachers who were asked to rate the degree to which certain conditions of implementation existed in their schools and to identify their own cognitive processes and behaviors in relation to information literacy.

After these data were gathered, they were analyzed using item analysis and factor analysis.

Delphi Findings

Introduction

The Delphi method varies according to the purpose of the study, structure of the rounds, types of questions, and number of participants. Typically, an open-ended first round questionnaire would require content analysis techniques in order to define the themes and topics used in subsequent rounds (Powell, 2003). Subsequent rounds that generate data that are more quantitative in nature would be summarized and analyzed using ranking or rating techniques, measures of central tendency, or some means of showing dispersion of scores (Jairath & Weinstein, Powell, 2003). Using these descriptive statistics, each expert participant was asked to reconsider his or her answer in light of the group's response and given an opportunity to revise his or her answers if he or she wished. The results were summarized again, and I established a criterion as to which answers or ideas indicated strong expert consensus and which did not. Using the criterion as a basis for consideration, I eliminated those items for which there did not appear to be strong consensus.

Round One Data Analysis

When all the responses to the Round One questionnaire had been received, I summarized and described the experts' responses using measures of central tendency—mean, median, and mode—for each question related to identification of the dimensions of implementation (See Table 3).

Table 3. *Round One results: Measures of central tendency*

	Dimension	Mean	Median	Mode
1	Community Investment	4.6	5	5
2	IL Policy	4.5	5	5
3	Identified and defined outcomes	5.0	5	5
4	Integrated Curriculum	4.8	5	5
5	Experiential Learning	4.6	5	5
6	Assessment	5.0	5	5
7	Adult Role Models	4.0	4	3,4,5
8	Staff Development	4.8	5	5
9	Student Leadership	3.8	4	4,5
10	Program Support / Evaluation	5.0	5	5

Table 3 (con't)

11	Librarian Characteristics			
	A Awareness	5	5	5
	B Knowledge	4.83	5	5
	C Management	4.5	5	5
	D Org. Structure	4.66	5	5
	E Impact	4.66	5	5
	F Collaboration	4.83	5	5
	G Adapting	4.66	5	5
12	Level of Use*	5	5	5
13	Innovations*	4.8	5	5

* One non-response on this question.

To compute the measures of central tendency for answers using a Likert scale, I assigned a numeric value to each interval in the Likert scale as follows: Not important at all = 1, Somewhat unimportant = 2, May or may not be important = 3, Somewhat important = 4, and Extremely important = 5. In addition, I assigned a value of 0 to the optional response "Irrelevant." For the demographic question in which the experts identified "all that apply," I simply summarized the responses into those marked positively (yes) and those marked negatively (no) as shown in Table 4. A number of additional demographics were suggested as a result of Round One.

Table 4: *Round One results for demographics*

Demographic	Yes	No	N
Grades Served: Elem, Sec., etc.	6	0	6
School Size	6	0	6
School Type: US Public, Intl.	6	0	6
School Location: Country, State, etc.	5	1	6
Librarian education and / or certification	5	1	6

The experts received the results of Round One in a follow-up session at which time they were given an opportunity to consider the new suggestions for demographics introduced in Round One, and to revise their own answers around the demographics in light of the responses by the whole expert group.

The results of Round One, as shown in Table 5, indicated a high level of consensus since 89% of the responses had a mean of 4 or above, and a unimodal distribution (Sprinthall, 1982/1994). I established the criterion for demonstrating strong consensus as having a mean above 4. Only two items potentially did not fit the criterion. One item, *Student Leadership*, had a mean of 3.8. It also had a bi-modal distribution, an indicator of a lack of consensus (Powell, 2003), so this item was eliminated as a dimension of implementation to be included in the instrument. A second item, *Adult Role Models*, showed a bit more consensus than that it had a mean of 4.0, a measure that

appeared to be subjective in terms of meeting the criterion. It also had a tri-modal distribution, however, suggesting that this result indicated a real lack of consensus by the experts. This item was also eliminated as a dimension of implementation for the instrument.

Table 5. Round One final results: Measures of central tendency

	Dimension	Mean	Median	Mode
1	Community Investment	4.6	5	5
2	IL Policy	4.5	5	5
3	Identified and defined outcomes	5.0	5	5
4	Integrated Curriculum	4.8	5	5
5	Experiential Learning	4.6	5	5
6	Assessment	5.0	5	5
7	Adult Role Models	4.0	4	3,4,5 Tri-modal
8	Staff Development	4.8	5	5
9	Student Leadership	3.8	4	4,5 Bi-Modal
10	Program Support / Evaluation	5.0	5	5

Table 5 (con't)

11	Librarian Characteristics			
	A Awareness	5	5	5
	B Knowledge	4.83	5	5
	C Management	4.83	5	5
	D Org. Structure	4.66	5	5
	E Impact	4.66	5	5
	F Collaboration	4.83	5	5
	G Adapting	4.66	5	5
12	Level of Use*	5	5	5
13	Innovations*	4.8	5	5

Note. * One non-response on this item

Another goal of Round One was to identify those demographics that might account for differences among schools in the implementation of an information literacy program. I set the criterion for inclusion of a particular demographic at unanimous or 100% of the participants. In Round One three demographics—*Grades Served, School Size, and School Type*—were identified by 100% of the participants as ones that could potentially explain differences among implementation of information literacy programs in schools (Table 6). Two demographics—*School Location* and *Librarian Education/Certification* did not meet the criterion and were eliminated. Seven additional demographics were introduced by participants during Round One. Participants were

asked to respond to these during the Follow up to Round One. After the Delphi participants considered these new demographics, four did not meet the criterion, and were eliminated. Three of the demographics—*Languages Spoken*, *Number and Availability of Computers*, and *FTE of Library Professionals and Staff*—did meet the criterion and were retained for the final instrument.

Table 6: *Round One final results for demographics*

Demographic	Yes	No	Total # of Respondents
Grades Served: Elem, Sec., etc.	6	0	6
School Size	6	0	6
School Type: US Public, Intl.	6	0	6
School Location: Country, State, etc.	5	1	6
Librarian education and / or certification	5	1	6
Additional Suggestions for Demographics			
1 Culture,	4	2	6
2 Special Needs population	5	1	6
3 Languages spoken	6		6
4 Number and availability of computers	5*		5
5 Subject matter, student test scores	3*	2	5

Table 6 (con't)

6	Student characteristics (e.g., SES, gifted, ESOL)	5	1	6
7	FTE of the library media specialist, LMC staffing	6		6

Note. * One non-response on this item

Round Two Data Analysis

One goal for Round Two was to identify a set of questions that would serve to measure or operationalize a dimension of implementation. Participants were presented with an initial set of six to seven potential questions and asked to rank them. They could also mark them as irrelevant. The idea was to validate the question as relevant and to have a ranking from which the top three to four best questions could be chosen for inclusion in the final instrument.

In the Round Two questionnaire, the respondents were asked to rank six to seven questions as to their importance or relevance in measuring a given dimension of implementation. Data analysis was conducted using SPSS. When entered into SPSS, each of those questions was treated as one variable and the set of questions related to a given dimension—usually six questions—was treated as one data set. Delphi participants assigned a priority ranking to each statement in a set of statements. Each ranking was

assigned a numeric value based on the number of potential answers—in most cases, first priority = 6; second priority = 5; third priority = 4; fourth priority = 3; fifth priority = 2; sixth priority = 1; irrelevant = 0—that was then used to compute an overall numeric “score” for each question by computing a sum of all the answers from all respondents.

For the purpose of item reduction, the top (4) scoring questions were retained and the remaining two or three were eliminated (Table 7). Some changes were made in wording

Table 7. Summary of Round Two results

Dimension 1: Recognized Need	Score
1a – Recognized need by students	14
1b – Recognized need by teachers	28
1c – Recognized need by administrators	25
1d – Communicated need	20
1e – Understanding around the need	23
1f - Stakeholder involvement	12
Dimension 2: School Policy	
2a – IL in mission statement	25
2b – IL in written curriculum	22
2c – IL adopted by school board	13
2d – IL adequately supported	16
2e – IL created with stakeholders	11
2f – Policy incentives in place	11

Table 7 (con't)

Dimension 3: Identified and Defined Outcomes	
3a – IL is defined for community	29
3b – Specific goals are in place	24
3c – Definitions are agreed upon	13
3d – Priorities are set	17
3e – Outcomes are communicated	11
3f – Outcomes are visible	7
Dimension 4: Integrated Curriculum	
4a – Curriculum is articulated	24
4b – Curriculum is integrated	21
4c – Integration is purposeful	15
4d – Integration is in units / lessons	16
4e – Part of written curriculum	9
4f – Accountability	13
Dimension 5: Experiential Learning	
5a – Many learning opportunities	17
5b – Equal learning opportunities	16
5c – Real world problems	21
5d – Technology is dynamic	19
5e – Appropriate methodologies	17
5f – Reflection	14

Table 7 (con't)

Dimension 6: Assessment	
6a – Appropriate assessments	22
6b – Point of learning assessments	22
6c – Variety of assessments	10
6d – Assessment of assessments	23
6e – Use of assessment data	17
6f – Communication of assessment data	11
Dimension 7: Staff Development	
7a – Invest in professional development	25
7b – Time for collaboration	22
7c – Time for curriculum development	13
7d – On-going professional development	21
7e – Use of experts	9
7f – Evaluation of PD program	15
Dimension 8: Program Support & Evaluation	
8a – On-going program evaluation	13
8b – Administrative commitment	28
8c – Adequate funding	20
8d – Flexible schedule	15
8e – Accountability	20
8f – Professionals supported	18

Table 7 (con't)

Dimension 9: Librarian Characteristics	
9a – Librarian interest	11
9b – Librarian experience	15
9c – Librarian management skill	13
9d – Organizational structure	10
9e – Focus on student performance	21
9f – Collaboration	23
9g – Adapt to meet the local needs	16
Dimension 10: Levels of Use	
A Nonuse	Accept
B Pre-use	Accept
C On-going Use	Accept
D Integrations	Accept
E Modifications	Accept
Dimension 11: Innovations	
Collaboration 1: Requested meeting	Accept
Collaboration 2: Looked at content	Accept
Collaboration 3: Deliver lesson	Accept
Leadership 1: Advocated informally	Accept
Leadership 2: Advocated formally	Accept
Leadership 3: Updated competencies	Accept

Table 7 (con't)

Technology 1: Guided use of new tech	Accept
Technology 2: Modeled use of tech	Accept
Technology 3: Learned new tech	Accept
Demographics	
1. School Type	Retained
2. School size.	Retained
3. Grades Served	Retained
4. Language Ability	Added
5. Computer Availability	Added
6. FTE Librarian and Assistant	Added

for clarification per recommendations by the Delphi members. Three demographics were added—language ability, computer availability, and full-time equivalent (FTE) of librarians and assistants—to the list of demographics to be included in the instrument. During the pilot, one of the demographics—FTE Librarians and Assistants—was split into two questions, one each for librarian and library assistant.

Draft Instrument

A first draft of the implementation survey was created from the Delphi results in preparation for the next phase of the study (Appendix P), which was a pilot to assess the general soundness of the instrument. The key construct—indeed, the main theoretical

concept— measured was the degree of implementation of a school information literacy program. This key construct was made up of the implementation factors which were identified as described previously by the expert group. Each of these implementation factors is considered one dimension, quality, or aspect of the key construct of implementation.

Since a construct cannot be observed directly, it must be measured in terms of behaviors associated with it. A set of questions for each dimension or implementation factor were identified by the Delphi group as described above that would—when answered—indicate the degree to which that dimension is present. The questions were written in such a way that they indicate—either individually or together—the degree to which a condition exists. It was expected that each set of questions would theoretically comprise at least one multi-item scale or a set of scales.

The draft instrument resulting from the pilot (Appendix P) was divided into four sections. The first section and the longest—*School Characteristics*—included all questions that could be answered with a seven-point Likert scale. The questions were mixed up by using an on-line number generator to designate the order. The second section—*Implementer Characteristics*—included two questions on implementer knowledge and behavior and was answered by a choice of one of five statements that

described a hierarchy of behaviors and knowledge. The third section—*Information Literacy Activities*—asked respondents to indicate those activities in which they had been engaged during specific periods of time: the past month, the past year, or more than a year/not at all. The fourth section—*Demographics*—included all the identified demographic questions identified in the Delphi phase of the study.

Pilot Study Findings

Pilot Participants

The four participants in the pilot—an administrator, a library-media specialist, a library-media coordinator, and a teacher—were chosen because they represent different professional roles in the life of the school and in implementation of curriculum standards or educational programs. It was only toward the end of the Delphi phase of the study that it became clear that the survey had the potential to be used more widely in one school than previously thought. In its initial design, the intention was to target librarians and curriculum developers—assigned as curriculum specialists in some schools and administrators in others—but not necessarily the teachers. The survey itself however seemed to lend itself to teacher input. For that reason, I chose to include a teacher in the pilot to see if the survey would, in fact, lend itself to teacher input and provide valuable information on that aspect of implementation in a school.

Pilot Study Data Analysis

The participants agreed that the instrument was generally sound, that it was understandable, and that it was formatted in a way that made sense to them. In the pilot participants judgment the instrument had both face and content validity; the instrument measured what it was designed to measure (face validity), and did not leave out any important concepts relevant to information literacy (content validity). All the participants were able to finish the survey within the estimated timeframe of no more than twenty minutes.

Most of the pilot participant's comments were confined to the need for clarification on individual questions. I brainstormed with participants for ways in which some questions could be written with greater clarity. In a few instances, the same questions required clarification for multiple participants. When this happened, I shared suggestions that were generated from previous interviews. In most cases, this further validated the positive impact that the suggested change had on the clarity of the survey question. There were differences in levels of knowledge related to the questions, but not marked differences in their understanding of the questions themselves.

Other discussions and suggestions from pilot participants included incorporating more nuance into survey language and other sorts of semantics issues; the goal was to

increase the clarity of both the questions and the answer options. Some of the changes that resulted from the pilot include: (1) reworking the question on professional position so the survey respondent could mark more than one choice and including the addition of an “other” field in case none of the choices described the survey respondent’s professional role; (2) including a column in the section on implementer characteristics that allowed a respondent to indicate they hadn’t engaged in the activities at all; (3) writing an introductory statement in the survey to provide a definition of what is meant and not meant by information literacy; (4) rewording some questions to ensure that all questions are relevant to all of the various participants—teachers, librarians, administrators—who would respond to the survey.

The instrument was also evaluated for the psychometric properties of reactivity and sensitivity. Reactivity occurs where the process of being measured changes the behavior of the respondent. I attempted to control for reactivity in the survey by promising confidentiality. I also attempted to minimize the respondents’ natural inclination to answer in social desirable ways by evaluating the survey questions to ensure that the tone was both non-threatening and non-judgmental.

Sensitivity refers to the instrument having sufficient ranges of answers so that differences can exist. If there is insufficient sensitivity, differences will not be apparent.

To ensure sensitivity, I asked the pilot group to evaluate the variability of the scale and sub-scales. Fortunately, the administration of the survey for the pilot did not produce either floor or ceiling effects; that is, everyone did not fall above or below the normal range of possible responses.

At the conclusion of the Delphi and Pilot phases of the study, the questions (Table 8) were organized into four sections: (1) school characteristics using a seven-point Likert for thirty-seven questions; (2) personal knowledge and experience using a five-point scale for two questions; (3) information activities using a three point scale for nine questions, and (4) demographics about the school and the professional role within the school of the person completing the survey.

Table 8. *The items in the survey at the conclusion of the Delphi and pilot*

Section I: School Characteristics, Questions 1-37 (7-point Likert).

1. Information literacy goals are defined as standards, understandings, and/or outcomes.
 2. Policy related to information literacy education has been adopted by the school board.
 3. There is adequate accountability for teaching information literacy education.
 4. New technologies are regularly incorporated into learning experiences.
 5. Integration of information literacy skills and knowledge is included in expectations for unit design and lesson planning.
-

Table 8 (con't)

-
6. Cooperative learning, peer mentoring, and/or inquiry-based methods are used to enhance student learning.
 7. The librarian in my division or school has a high level of competency with information literacy.
 8. Appropriate assessments of information literacy outcomes are included within units and/or lessons.
 9. Assessment data is used to evaluate the effectiveness of the school information literacy program.
 10. Appropriate assessments are used to evaluate student progress in meeting information literacy outcomes.
 11. Professional development includes communication of best practice in information literacy teaching and learning.
 12. The librarian is empowered to manage an information literacy program.
 13. All students have many opportunities to practice and apply information literacy skills and knowledge.
 14. Information literacy is part of the curriculum across all relevant curriculum areas.
 15. There is a generally recognized need among the administration that students need to learn or improve their information literacy skills.
 16. Integration of information literacy skills and knowledge is tracked in the implemented curriculum.
 17. The librarian maintains a focus on the impact of information literacy education on student performance.
-

Table 8 (con't)

-
18. Resources are allocated for information literacy professional development.
 19. Information literacy is part of the implemented curriculum and articulated through all grade levels.
 20. Information literacy is part of the school's mission statement or philosophy.
 21. Teachers generally recognize that students need to learn or improve their information literacy skills.
 22. Information literacy policy is communicated at the classroom level.
 23. There is a support system—peer advisor, coach, administrative liaison—in place for librarians and teachers who are implementing information literacy programming.
 24. Information literacy standards and/or outcomes are included in the written or documented curriculum of the school.
 25. There is an understanding among the faculty that students must and will have information literacy knowledge and skills as part of their education in the school.
 26. The school administration is committed to information literacy education.
 27. Information literacy staff development opportunities are evaluated for their effectiveness.
 28. Information literacy assessment tools are evaluated to ensure they measure the identified outcomes.
 29. The librarian cooperates and collaborates with others on information literacy program development.
 30. Priorities or emphasis for implementation of information literacy outcomes or standards are agreed upon by the educators in the school.
-

Table 8 (con't)

-
31. Professional development includes time for collaboration.
32. Information literacy outcomes are communicated throughout the school and community.
33. Information literacy program development receives adequate funding.
34. The librarian adapts information literacy practice to meet the needs of my particular school, culture, and institution.
35. The school administration communicates a need for students to have information literacy skills.
36. Real world (authentic) problems are included in the information literacy curriculum.
37. A definition of information literacy has been agreed upon by teachers, administrators, and parents.
- Section II: Implementers' knowledge and experience, Questions 38-39 (5-point scale).
38. Which statement best describes your current level of knowledge of information literacy?
- a. I have little or no knowledge of information literacy.
 - b. I have some knowledge of information literacy.
 - c. I am fairly comfortable with my knowledge of information literacy.
 - d. I am very familiar with information literacy learning.
 - e. I am intimately familiar with information literacy.
-

Table 8 (con't)

39. Which description below best describes your current behavior and thinking about information literacy?

- a. I have not and do not anticipate learning about or using information literacy programming in my school.
- b. I am acquiring information about information literacy through general professional exposure: written materials, orientation sessions, observing others and/or training sessions. I am preparing to support it, use it, or implement it for the first time in my school.
- c. I support or have an established or stable program that runs in a fairly routine fashion in my school. I support—either directly or indirectly—most of the information literacy programming with which the students for whom I am responsible are engaged.
- d. I work with or support teachers and/or colleagues to create and deliver information literacy lessons that are integrated into or coordinated with their classroom activities and lessons.
- e. I am re-evaluating information literacy learning to find modifications or alternatives that will achieve greater student learning for my particular student population.

Section III: Implementation Activities, Questions #40-48 (3-point scale)

40. Updated personal competencies in information literacy through professional reading or other professional development opportunities.

Table 8 (con't)

-
41. Requested, initiated, or had a meeting with a teacher or teaching colleague for the purpose of communicating, cooperating, or collaborating on information literacy instruction.
 42. Modeled and promoted effective uses of technology for learning and teaching.
 43. Looked at content curriculum goals to find a connection with information literacy.
 44. Learned or support the learning of a new technology or new aspect of an existing technology.
 45. Advocated informally for information literacy education with a colleague or a group of colleagues or teachers.
 46. Collaborated with a teaching colleague or supported teaching colleagues to plan, deliver, or assess an information literacy lesson.
 47. Advocated formally for information literacy education in a curriculum planning session, department/team/divisional meeting, or professional organization.
 48. Guided, encouraged, or supported students and teachers in the use of new media and technologies.

Section IV: Demographics

49. How would you describe your school?
 - a. United States Public (Including Magnet or Charter School)
 - b. United States Private or Independent
 - c. International
 - d. Other _____
-

Table 8 (con't)

50. Which grade level range most closely describes the students served by the

division/school to which you belong?

- a. Elementary
- b. Middle/Junior High School
- c. High School
- d. Other, please specify _____

51. How many students attend your division/school?

- a. Fewer than 200
- b. 200 - 499
- c. 500 - 1,000
- d. More than 1,000

52. What percentage of students is proficient in the language of instruction in your

division/school?

- a. 75 — 100%
 - b. 50 — 74%
 - c. 25 — 49%
 - d. 0 — 24%
-

Table 8 (con't)

53. Are there an adequate number of computers available for students to use in the division/school to which you belong?

- a. Almost always
- b. Sometimes
- c. Rarely
- d. Never

54. How many full-time equivalent (FTE) librarians do you have in your division/school?

- a. No FTE Librarians
- b. Less than 1 FTE Librarian
- c. 1 FTE Librarian
- d. More than 1 FTE Librarian

55. How many full-time equivalent (FTE) support staff do you have in your division/school library?

- a. No support staff
- b. Less than 1 FTE support staff
- c. 1 FTE support staff
- d. More than 1 FTE support staff.

Survey Administration Findings

Introduction

Data gathered from the survey administration were analyzed differently for the various sections into which the questions (Table 8) were organized. The first section and the longest—*School Characteristics*—included all questions that could be answered with a seven-point Likert scale. Analysis for this section included both an item analysis and a factor analysis. The second section—*Implementer Characteristics*—included two questions on implementer knowledge and behavior and was answered by a choice of one of five statements that described a hierarchy of behaviors and knowledge. This section was analyzed by running correlations with the other sections of the survey. The third section—*Information Literacy Activities*—asked respondents to indicate those activities in which they have been engaged during specific periods of time: the past month, the past year, or more than a year/not at all. This section was analyzed using descriptive statistics and computing frequencies. The fourth section—*Demographics*—included all the identified demographic questions identified in the Delphi phase of the study. This section was analyzed by using each demographic to disaggregate the data to discover differences that might exist.

Section I: Questions 1 – 37 (7-point Likert)

Item Analysis

To obtain descriptive statistics and assess the internal reliability of the instrument, an item analysis was conducted for the thirty-seven school characteristics (Table 8, Section I). The purpose of an item analysis is to remove weak items, thereby increasing the reliability of the instrument. The item analysis also helps evaluate which items should be included in a scale. The item analysis consisted of running an inter-item correlation (Cronbach's alpha) for each of the nine identified dimensions of implementation operationalized by questions 1-37 in Section I: School Characteristics. The results are shown in Tables 10 through 18.

The initial examination of the items' performance indicated generally acceptable or strong attributes in a number of areas: Cronbach's alpha for both the scales and individual items was in a range considered very good; item means were close to the center; item variance was strong; and inter-item correlations were high. See tables 9 through 17 and further explanations below.

Table 9. *Item analysis statistics for dimension 1: Recognized need*

Cronbach's Alpha = .91				
Item	Mean	Standard Deviation	Item Total Correlation	Cronbach's Alpha if Deleted.
Q21	4.57	1.74	.757	.90

Table 9 (con't)

Q15	4.37	1.81	.799	.89
Q35	3.71	1.98	.854	.87
Q25	4.07	1.82	.910	.88

Table 10. *Item analysis statistics for dimension 2: Policy*

Cronbach's Alpha = .85				
Item	Mean	Standard Deviation	Item Total Correlation	Cronbach's Alpha if Deleted
Q20	3.54	1.91	.684	.81
Q24	4.02	1.97	.717	.80
Q02	4.10	2.12	.651	.83
Q22	3.45	1.69	.742	.79

Table 11. *Item analysis statistics for dimension 3: Outcomes*

Cronbach's Alpha = .84				
Item	Mean	Standard Deviation	Item Total Correlation	Cronbach's Alpha if Deleted
*Q01	4.99	1.71	***.405	****.91
Q30	3.52	1.73	.799	.75
Q32	3.22	1.75	.810	.75
*Q37	**2.93	1.83	.767	.77

Note. * Item requiring further evaluation due to statistical results in the item analysis; ** Lowest mean in all sub-scale; *** Low Item Total Correlation; **** Item that increases Cronbach's alpha when deleted.

Table 12. *Item analysis statistics for dimension 4: Integration*

Cronbach's Alpha = .90				
Item	Mean	Standard Deviation	Item Total Correlation	Cronbach's Alpha if Deleted
Q19	3.93	1.84	.774	.87
Q14	4.17	1.86	.832	.85
Q05	4.19	1.79	.731	.88
Q16	3.40	1.74	.777	.87

Table 13. *Item analysis statistics for dimension 5: Learning*

Cronbach's Alpha = .82				
Item	Mean	Standard Deviation	Item Total Correlation	Cronbach's Alpha if Deleted
Q04	5.00	1.56	.573	.81
Q06	4.49	1.60	.696	.76
Q13	4.67	1.70	.684	.76
Q36	4.02	1.85	.667	.77

Table 14. *Item analysis statistics for dimension 6: Assessment*

Cronbach's Alpha = .93				
Item	Mean	Standard Deviation	Item Total Correlation	Cronbach's Alpha if Deleted
Q08	3.79	1.62	.821	.91
Q10	3.62	1.79	.900	.89
*Q28	3.10	1.68	.756	****.93
Q09	3.37	1.74	.892	.89

Note. * Item requiring further evaluation due to statistical results in the item analysis;
**** Item that increases Cronbach's alpha when deleted.

Table 15. *Item analysis statistics for dimension 7: Professional development*

Cronbach's Alpha = .88				
Item	Mean	Standard Deviation	Item Total Correlation	Cronbach's Alpha if Deleted
Q11	3.82	1.83	.750	.84
Q18	3.92	1.86	.693	.86
Q27	3.16	1.84	.791	.83
Q31	3.33	1.88	.741	.84

Table 16. *Item analysis statistics for dimension 8: Support*

Cronbach's Alpha = .84				
Item	Mean	Standard Deviation	Item Total Correlation	Cronbach's Alpha if Deleted
Q03	3.61	1.82	.658	.80
Q23	3.22	1.85	.651	.80
Q26	3.94	1.95	.751	.76
Q33	3.30	1.84	.631	.81

Table 17. *Item analysis statistics for dimension 9: Librarian*

Cronbach's Alpha = .82				
Item	Mean	Standard Deviation	Item Total Correlation	Cronbach's Alpha if Del.
*Q07	**5.9	1.11	***.474	****.82
Q12	4.42	1.84	.536	.81
Q17	4.68	1.68	.645	.77
Q29	5.04	1.63	.710	.75
Q34	5.14	1.57	.738	.74

Note. * Item requiring further evaluation due to statistical results in the item analysis; **

Highest mean in all sub-scales. Examined to see cause; *** Low Item Total Correlation;

**** Item that increases Cronbach's alpha when deleted.

Cronbach's Alpha

DeVellis (2003) states that one of the most important indicators of a scale's quality is the reliability coefficient, alpha. Alpha indicates "the proportion of variance in the scale scores that is attributable to the true score" (DeVellis, 2003, p. 95). Although methodologists suggest different acceptable levels for alphas, a generally acceptable value at the low end is .70 (as cited by DeVellis, 2003). In addition, DeVellis (2003) provides the following guidelines for evaluating alpha scores according to the following: below .60, unacceptable; between .60 and .65, undesirable; between .65 and .70, minimally acceptable; between .70 and .80, respectable; between .80 and .90, very good; much above .90, one should consider shortening the scale. In this analysis, seven out of nine Cronbach's alphas for the sub-scales (dimensions) fell between .80 and .90, a range considered very good. The other two Cronbach's alphas were in the range over .90, a range considered very high.

Problems with individual questions tend to reduce alpha. Logically then, eliminating a question that is problematic—a non-central mean, poor variability, weak inter-item correlations—will likely increase Cronbach's alpha. If eliminating an item increases Cronbach's alpha, the item should be evaluated for elimination from the scale. In this analysis, three items—Q01, Q28, and Q07—increased Cronbach's alpha when

eliminated (See Tables 11, 14, and 17). Each of these items was noted for possible elimination from the scale as further analysis was conducted.

Item Means

On a seven-point scale like the one used for all of these items, a mean near 4—the one closest to the center of the range of possible scores—is the best (DeVellis, 2003).

The range of means for all the items in this scale was 2.93 to 5.9 with 86% of the items falling in the range above 3.0 and below 5.0. Of the five items outside of the 3.0-5.0 range, none of the scores—2.93, 5.00, 5.04, 5.14, 5.9—was near an extreme for the range. Thus, the item means in the early stages seemed to indicate acceptably written items, although the two items at the lowest (item Q37 at 2.93) and highest (item Q07 at 5.9) ends of the range were noted as ones to watch as the analysis progressed.

Item Variances

Another valuable attribute of a scale is a relatively high variance among the items (DeVellis, 2003). The three primary measures of variability are range, standard deviation, and variance. In general, a standard deviation closer to zero represents less variability (Shannon & Davenport, 2001). Each of the items in the 9 sub-scales showed standard deviations that exceeded 1.56, a relatively high level of variability.

Inter-item Correlations

Another important attribute of any scale is the degree of correlation among the items comprising the scale. The goal is to have a set of highly correlated items. In this analysis, a corrected inter-item correlation was conducted as indicated in the Item Total Correlation column in Tables 9-17. A “corrected” item correlation means that the item is correlated with all the items in the scale, excluding itself. Although item-total correlations were not used for item reduction purposes, a higher value is more desirable than a lower value (DeVellis, 2003). Consequently, items Q01 (See Table 11) and Q07 (See Table 17), both of which had a value of .40 and .47 respectively, indicated a need to evaluate these questions further for possible elimination from the survey.

Item Q01 (Table 11) asked the respondents if information literacy goals are defined as standards, understandings, and or outcomes. A histogram of the responses to the question (Figure 1) was left-skewed indicating a highly positive response relative to the other items in the sub-scale (Figures 2-4) which were generally right skewed.

Figure 1. Histogram for Item Q01

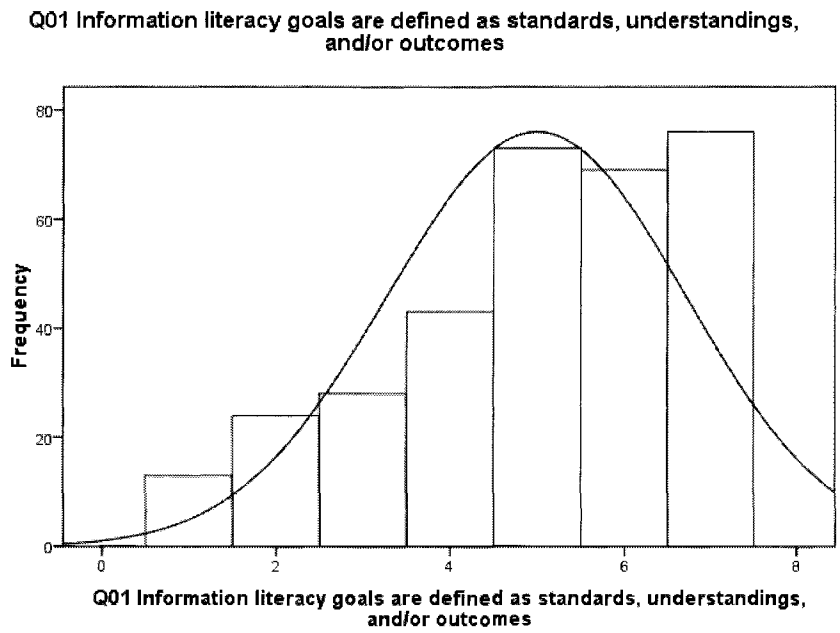


Figure 2. Histogram for Item Q30

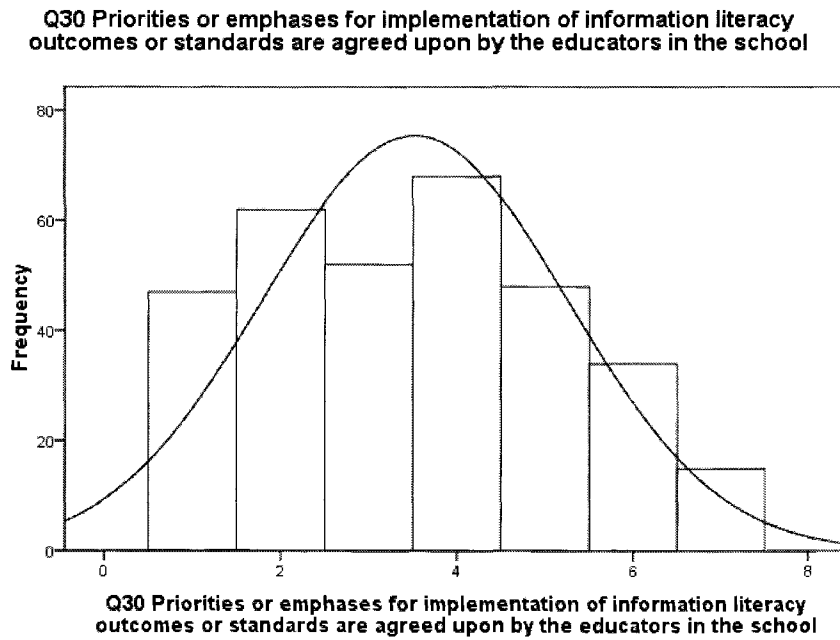


Figure 3. Histogram for Item Q32

Q32 Information literacy outcomes are communicated throughout the school and community

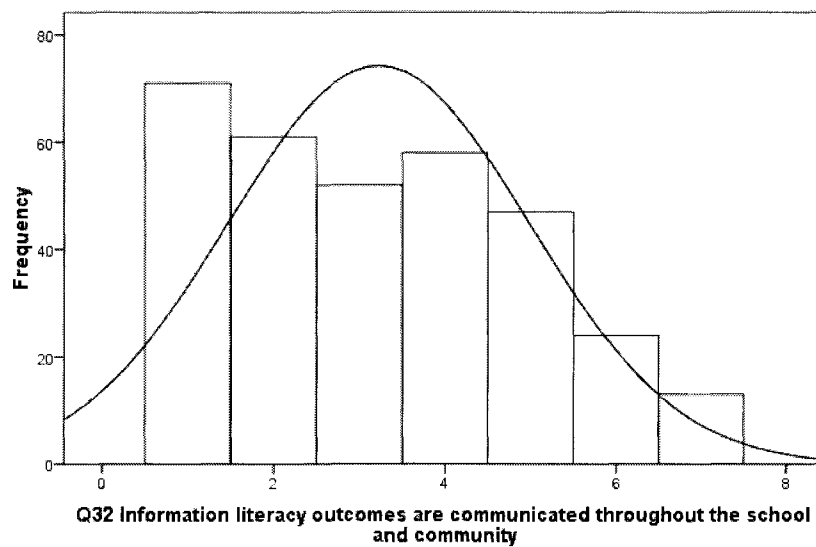
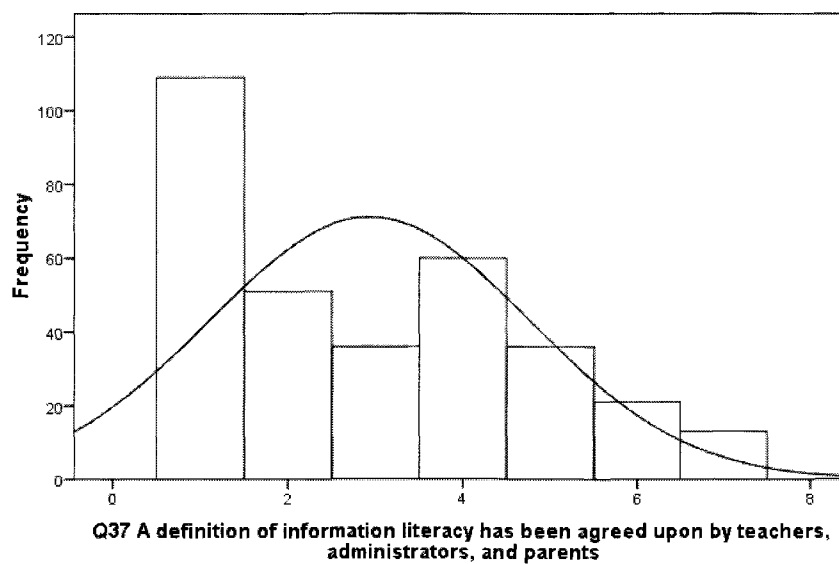


Figure 4. Histogram for Item Q37

Q37 A definition of information literacy has been agreed upon by teachers, administrators, and parents



Although the loading for item Q01 was low in comparison to other items, it was above the threshold of .3 set for retention of items in a factor. In addition, the results for Item Q01 does not necessarily indicate a poorly written or “bad” question. It makes sense that respondents would answer this question positively most of the time since it is quite common within a particular state or school district to have a set of information literacy standards, understandings, or outcomes. Conversely, it might not be common to have community agreement as to a local definition of information literacy (Q37), a set of priorities for emphasis (Q30), or communication of the outcomes (Q32). This question was retained.

Item Q07 asked the respondents to assess the librarian’s level of competency in information literacy. Again, a histogram of the responses to this question (Figure 5) was left-skewed, again indicating a highly positive response as well relative to the other four items (Figures 6-9) in this scale. This dimension is a sub-scale that looks at implementer—generally the librarian—characteristics. In answering this question, some participants are evaluating another person who is the implementer of information literacy programming. In other cases, the participant is self-evaluating. This may account for a lower correlation even though the correlation was within an acceptable range. At this point, I considered eliminating this item, but I ran the factor analysis with all the items

still included to see how they would look in the factor analysis, since a couple were suspect, but none were so significantly out of an acceptable range as to warrant elimination without further analysis.

Figure 5. Histogram for Item Q07

Q07 The librarian in my division or school has a high level of competency with information literacy

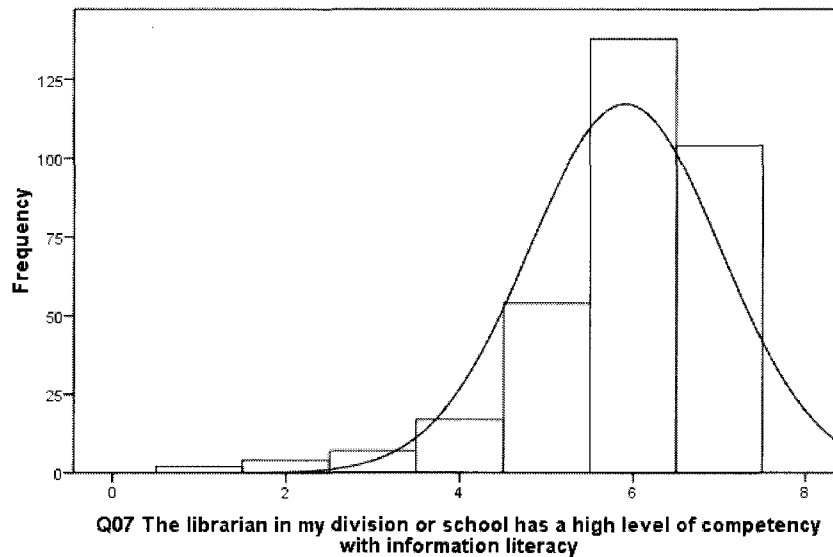


Figure 6. Histogram for Item Q12

Q12 The librarian is empowered to manage an information literacy program

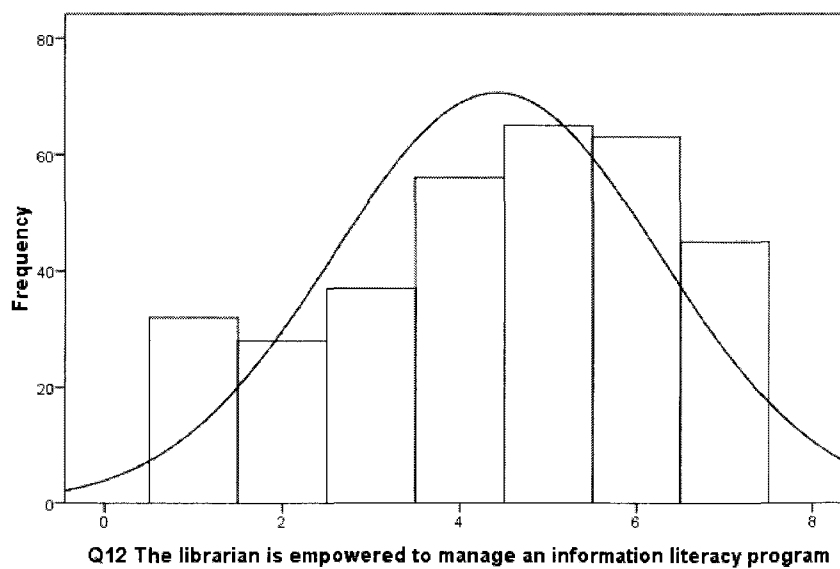


Figure 7. Histogram for Item Q17

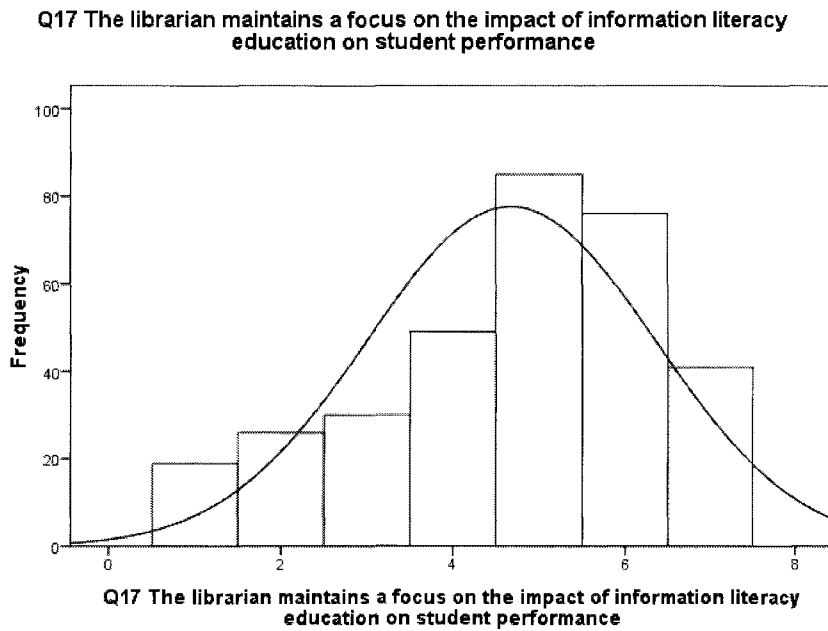


Figure 8. Histogram for Item Q29

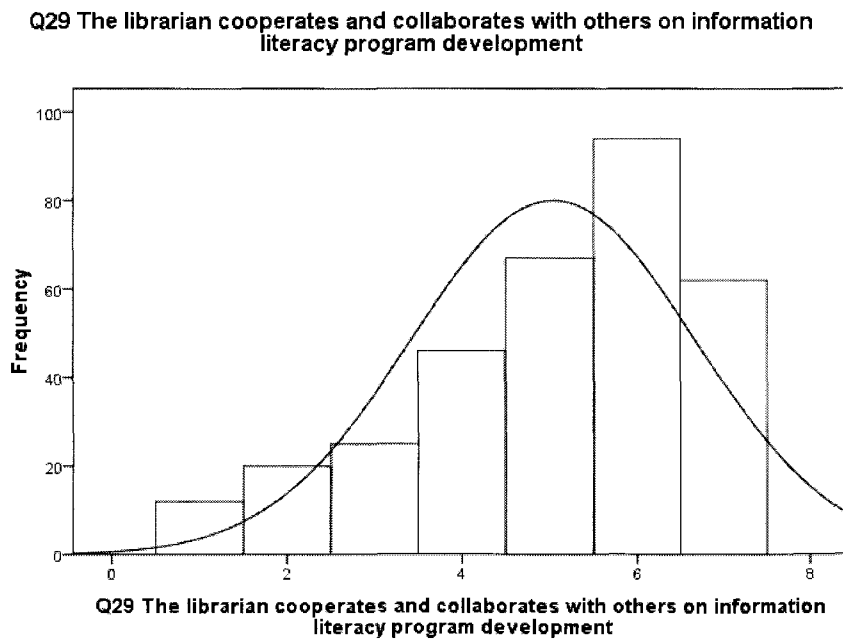
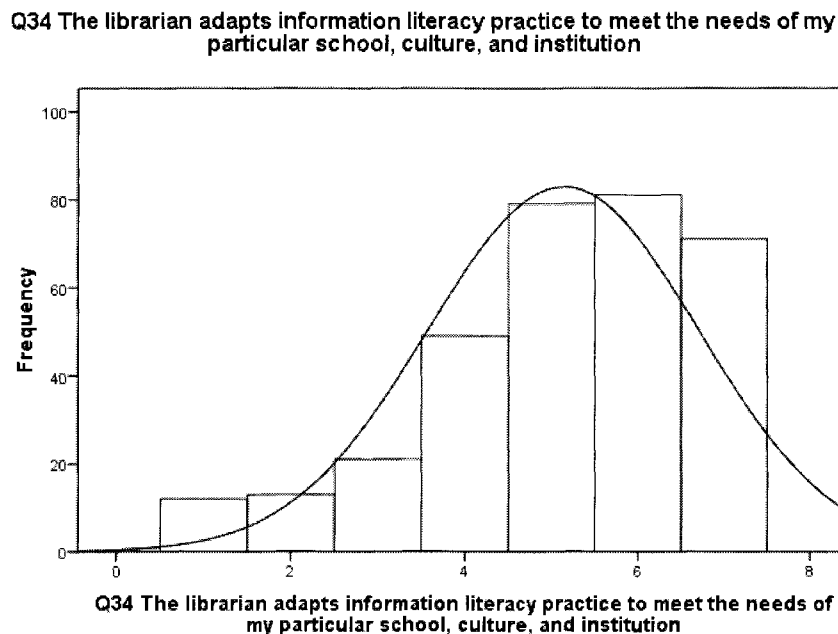


Figure 9. Histogram for Item Q34



Factor Analysis

Factor analysis was run in order to identify underlying themes, dimensions, or factors of implementation represented by the items (variables) in the survey. In essence, a factor analysis distinguishes a factor by identifying sets of variables that have more in common with one another than with the other variables in the analysis (Meyers, Gamst, & Guarino, 2006). The type of factor analysis used in this study was a principal components analysis. To conduct the analysis, data from 326 cases (completed surveys) were used; this is a sample size that is considered *good* following generally accepted guidelines (Meyers, Gamst, & Guarino, 2006, p. 467).

The 37 items analyzed in the factor analysis are the same as those for the item analysis show in Tables 10 through 18 as no items were eliminated as a result of the item analysis. The factor analysis was run through SPSS (2007) using the *Data Reduction: Factor* procedure. The method for determining—or extracting--the appropriate number of factors was to retain factors with eigenvalues greater than 1. An initial run yielded 4 factors with eigenvalues greater than one (Table 18).

Table 18. *Factor analysis results showing 4 factors*

Factor	Eigenvalues	Explained Variance	Cumulative Explained Variance
1	7.03	19.00	19.00
2	6.86	18.55	37.55
3	6.38	17.25	54.80
4	5.26	14.20	69.00

A varimax rotation was used as a statistical method for loading items into a specified set number of factors (Table 19). The lowest loading value within any of the four components was .454, well above the minimally accepted threshold of .30 – .35 based on the sample size of 326 (Hair, Anderson, Tatham, & Black, 1998, p. 112).

Each component was assessed to see what themes or commonalities exist among the items that comprise the component (factor). The following names were given to each of the four factors identified through the factor analysis: Factor 1, *Program Articulation and Development*; Factor 2, *School Culture*; Factor 3, *Curriculum and Instruction*; Factor 4, *Librarian as Key Implementer*. However, three items—items 2, 19, and 36—did not appear to be in an item cluster with the best fit and were moved to create a more logical fit, something that can and should be done when it makes sense to do so (Hair, Anderson, Tatham, & Black, 1998). In each case, the threshold loading of the item on the new component to which it was moved still exceeded .30 as shown in Table 25.

Table 19. *Component items (highlighted) and loading values*

Item	Component			
	1	2	3	4
Q27	.76	.34		
Q28	.73	.31	.35	
Q32	.68	.50		
Q31	.68	.40		
Q23	.64	.30		
Q11	.64		.43	
Q09	.63		.59	
Q37	.62	.47		

Table 19 (con't)

Q30	.60	.47		
Q18	.59			.36
Q16	.59	.45	.43	
Q33	.48	.43		
Q21		.74		
Q35	.45	.73		
Q25	.34	.72	.38	
Q26	.46	.71		
Q15	.32	.70		
Q20	.43	.63		
Q22	.45	.58	.44	
Q24	.33	.56	.40	
Q19	.42	.45	.36	.42
Q05	.36	.33	.67	
Q03	.47		.64	
Q08	.50		.63	
Q01			.63	.32
Q10	.58		.62	
Q06		.34	.58	.31
Q02	.34	.30	.58	
Q14	.35	.49	.54	

Table 19 (con't)

Q04		.30	.52	
Q13		.39	.47	.43
Q34				.80
Q29				.76
Q17	.37			.67
Q07				.67
Q36	.47		.32	.48
Q12	.43			.45

Note: Loadings <.3 are not shown.

At this point, I ran a new inter-item correlation on the four factors in order to check the corrected inter-item correlation and Cronbach's alpha with the newly factored items as shown in Tables 20 through 23.

Table 20. *Factor 1: Program Development, reliability statistics*

Cronbach's Alpha = .95

N of items = 14

Item Total Statistics				
Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected	Cronbach's Alpha if Item Deleted
			Item-Total Correlation	
Q27.	45.16	358.98	.83	.95

Table 20 (con't)

Q28.	45.22	363.17	.84	.95
Q31.	45.00	361.15	.77	.95
Q32.	45.10	359.17	.87	.95
Q23.	45.11	366.51	.71	.95
Q11.	44.51	362.55	.78	.95
Q09.	44.96	365.33	.78	.95
Q37.	45.39	362.41	.78	.95
Q30.	44.80	363.37	.82	.95
Q18.	44.40	366.22	.71	.95
Q16.	44.93	362.52	.83	.95
**Q33.	45.02	371.09	.64	.95
**Q19.	44.40	364.67	.74	.95
*Q02.	44.22	364.50	.63	.95 (loading .34)

Note. * = items in which Cronbach's alpha goes up when the item is deleted; ** = items in which the loading is below .5 in the factor analysis; --- (strike-through) = items removed from the survey.

The results for Factor 1 indicated a continuing problem with Q2 in that Cronbach's alpha increased when the item was deleted. At this point it seemed prudent to eliminate Q02 from the scale given its effect on Cronbach's alpha when deleted combined with the low loading figure seen earlier in the factor analysis. One explanation for the problem with this question might be that the term *policy* in this question can be interpreted two ways: generically as in a guideline or methodology, or as a legal and binding agreement.

Because this question deals with the school board, a body that specifically deals with legal policy, but not generally policy related to specific curriculum (something about which this question asks), this question could be confusing. Regardless of the explanation for a weakness in this question, eliminating it strengthened the scale statistically, so it was eliminated. I also checked Q33 and Q19, two questions that were at the low end of the range (below .5) in the factor analysis. Q33 had a low corrected item-total correlation—well below .7—in relation to the other items and a Cronbach’s alpha that, while it didn’t increase when the item was deleted, did stay the same. Because Cronbach’s alpha for the scale, above .9, indicates that the scale could be shortened (DeVellis, 2003), I made the decision to eliminate Q33 as well. Q19 showed an acceptable corrected item-total correlation—over .7—and a strong Cronbach’s alpha, so it was retained in the scale.

The results for Factor 2 (Table 21) showed nothing remarkable in that there were no weak items evidenced by low corrected item-correlations or Cronbach’s alphas that increased when an item was eliminated.

Table 21. *Factor 2: School Culture, reliability statistics*

Cronbach’s Alpha = .94

N of items = 8

Table 21 (con't)

Item Total Statistics				
Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected	Cronbach's Alpha if Item Deleted
			Item-Total Correlation	
Q21.	27.10	129.28	.74	.94
Q35.	27.96	119.54	.88	.93
Q25.	27.60	123.81	.86	.93
Q26.	27.74	120.36	.88	.93
Q15.	27.31	125.93	.80	.94
Q20.	28.13	126.14	.74	.94
Q22.	28.22	128.32	.80	.94
Q24.	27.65	125.66	.73	.94

The results for Factor 3 (Table 22) showed one item, Q01, in which Cronbach's alpha went up slightly when the item was deleted. Q01 was also one of the weaker items in terms of its corrected item-total correlation. However, its loading value from the previous factor analysis was in the mid-range relative to the other items in the scale, and, most importantly, the question asked something important related to curriculum development; that is, have information literacy goals been defined as standards, understandings, or outcomes? For this reason, Q1 was retained. Items Q13 and Q36 had loading values below .5 in the previous factor analysis, but both showed strong corrected item-total correlations and stable Cronbach's alphas, so they were both retained.

Table 22. *Factor 3: Curriculum and Instruction, reliability statistics*

Cronbach's Alpha = .93

N of items = 10

Item Total Statistics				
Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected	
			Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q05.	38.37	150.62	.81	.92
Q03.	38.96	151.21	.78	.92
Q08.	38.78	154.43	.81	.92
*Q01.	37.57	161.82	.57	.93 (loading .63)
Q10.	38.94	151.08	.80	.92
Q06.	38.07	156.25	.77	.92
Q04.	37.56	163.47	.59	.93
Q14.	37.89	155.68	.73	.92
**Q13	38.39	149.40	.81	.92
**Q36	38.54	153.78	.70	.93

Note. * = items in which Cronbach's alpha goes up when the item is deleted; ** = items in which the loading is below .5 in the factor analysis.

The results for Factor 4 (Table 23) showed one item, Q07, in which Cronbach's alpha went up slightly when the item was deleted. Item Q07 also had a low corrected item-total correlation of .474, and had demonstrated a weakness or problem in the first item analysis as well. For these reasons, item Q07 was eliminated. Item Q12, an item

with a loading below .5 in the factor analysis, showed the lowest corrected item-total correlation among the items in Factor 4, but its Cronbach's alpha was strong and did not go down when the item was deleted. For this reason, it was retained.

Table 23. *Factor 4: Librarian as Key Implementer, reliability statistics*

Cronbach's Alpha = .82

N of items = 5

Item Total Statistics				
Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q34.	20.05	22.89	.73	.74
Q29.	20.14	22.78	.71	.75
Q17.	20.51	23.21	.64	.77
*Q07.	19.28	29.50	.47	.82 (loading .67)
**Q12.	20.76	23.48	.53	.81

Note. * = items in which Cronbach's alpha goes up when the item is deleted; ** = items in which the loading is below .5 in the factor analysis.

After eliminating items from the factors, I ran the 4-Factor analysis to see the loading values at this point as shown in Table 24. Again, a number of items loaded in

Table 24. *Four Factor Solution and Final Loadings (N = 326)*

	Component			
	1	2	3	4
Q27	.77	.33		
Q28	.75	.31		
Q09	.70		.51	
Q32	.69	.50		
Q11	.66		.39	
Q37	.65	.47		
Q31	.64	.40		
Q23	.64	.30		
Q10	.63		.56	
Q16	.60	.44	.37	
Q30	.59	.47		.33
Q18	.50			.44
Q35	.45	.73		
Q21		.73	.34	
Q25	.34	.70	.40	
Q15	.32	.70		
Q26		.70		
Q20	.45	.63		
Q22	.49	.57	.39	

Table 24 (con't)

Q24	.35	.55	.38	
Q05	.41	.30	.67	
Q06		.31	.64	
Q01			.62	
Q08	.53		.62	
Q04			.59	
Q03	.54		.57	
Q14	.35	.48	.57	
Q13		.36	.56	.41
Q34				.80
Q29				.79
Q17				.72
Q36	.41		.34	.53
Q12	.37		.33	.48
Q19	.36	.44	.39	.47

clusters that did not seem to be the best fit and were moved. Item Q10, a question on student assessments was previously in component #3, a seemingly good fit. Although it could logically cluster with component #1, I moved it to component #3 to create a greater balance of the components and as a good fit. Item Q36, a question on the inclusion of real-world problems in the curriculum was moved to component #3, the cluster on

curriculum and instruction. This seemed to be the only logical choice although it was the third highest loading for the item. However, the loading was above .3, the threshold set for inclusion of items. Item Q19, a question about articulation of the curriculum, was moved to component #3, the cluster on curriculum and instruction.

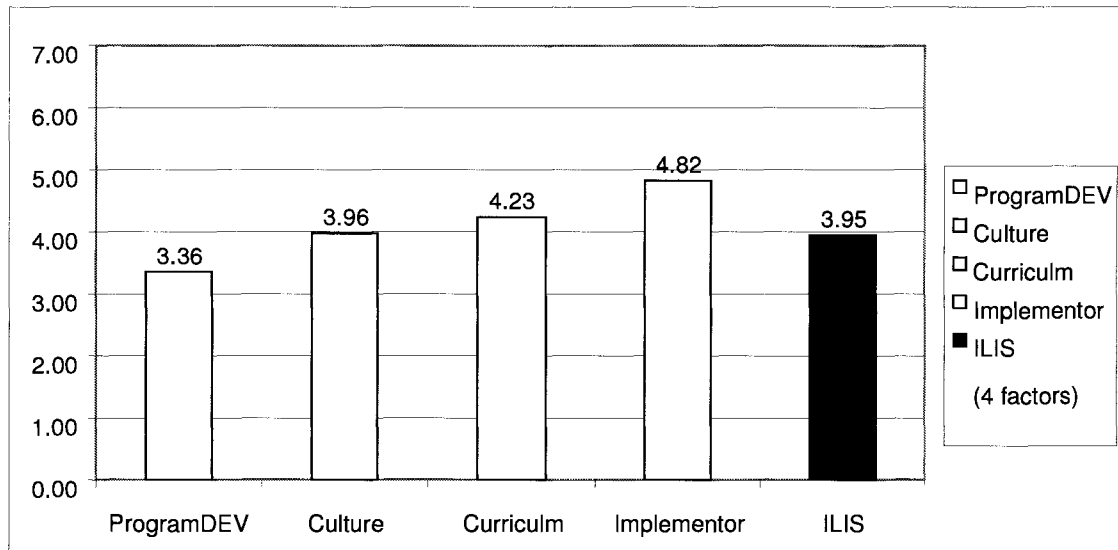
A reliability test was run on each of the new subscales as shown in Table 25.

Table 25. *Reliability of the Sub-scales*

Subscale	Item included	The number of items	Cronbach's alpha
1	9, 11, 16, 18, 23, 27, 28, 30, 31, 32, 37	11	.95
2	15, 20, 21, 22, 24, 25, 26, 35	8	.94
3	1, 3, 4, 5, 6, 8, 10, 13, 14, 19, 36	11	.94
4	12, 17, 29, 34	4	.82

Cronbach's alpha was above .8 for all four components. Finally, I ran an average score for each of the four factors along with a combined weighted-average score for the four factors combined (ILIS score) as shown in Figure 10.

Figure 10. Weighted Average Score of 4 Factors Individually and Combined (ILIS)

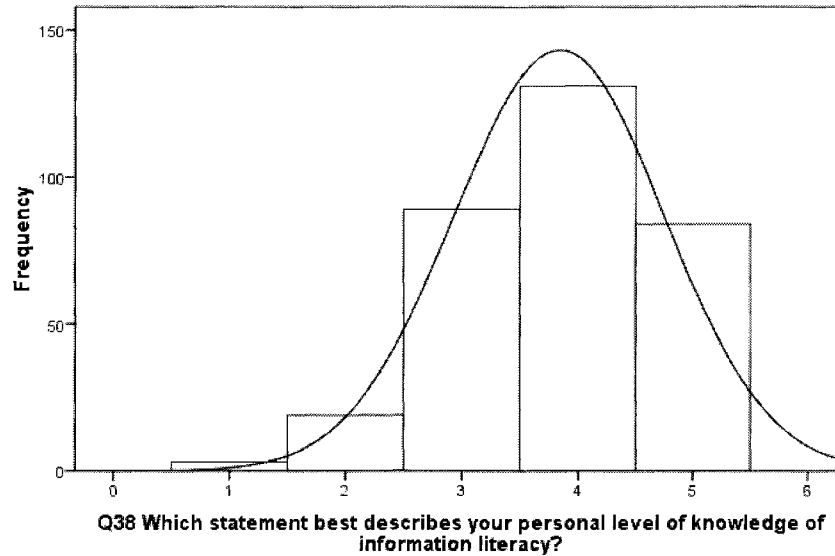


Section II: Questions 38-39 (5 item choice)

Item Q38 was designed to assess the current knowledge of the participant. This question asked the participant to mark the statement on a 5-item scale that best described them. The answer choices for Q38 on level of knowledge included: (1) I have little of no knowledge of information literacy; (2) I have some knowledge of information literacy; (3) I am fairly comfortable with my knowledge of information literacy; (4) I am very familiar with information literacy; (5) I am intimately familiar with information literacy. An histograms for Q38 (Figures 11) shows a normal distribution with a mean of 3.84 for level of knowledge, a better than average score.

Figure 11. Histogram for Item Q38

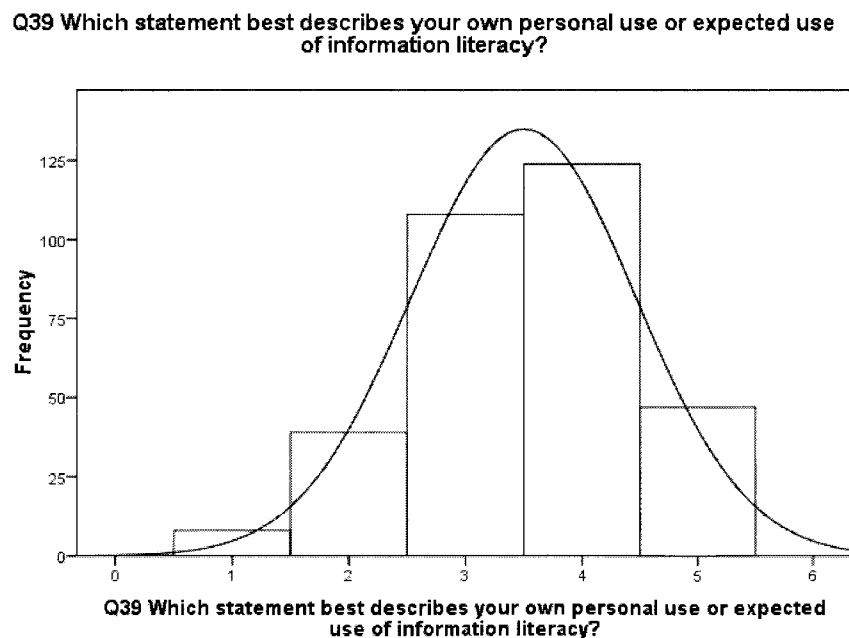
Q38 Which statement best describes your personal level of knowledge of information literacy?



Item Q39 was designed to assess the experience of the survey participants with information literacy. Like Q38, this question asked the participant to mark the statement on a 5-item scale that best described them. The answer choices for Q39 on experience with information literacy included: (1) I have not and do not anticipate learning about or using information literacy programming in my school; (2) I am acquiring information literacy through general professional exposure: written materials, orientation sessions, observing others and/or training sessions. I am preparing to support it, use it, or implement for the first time in my school; (3) I support or have an established or stable program that runs in a fairly routine fashion in my school. I support—either directly or indirectly—most of the information literacy programming with which the students for

whom I am responsible are engaged; (4) I work with or support teachers and/or colleagues to create and deliver information literacy lessons that are integrated into or coordinated with their classroom activities and lessons; (5) I am re-evaluating information literacy learning to find modifications or alternatives that will achieve greater student learning for my particular student population. An histograms for Q39 (Figure 12) shows a normal distribution for experience with a mean score of 3.5 for experience. Again, this is a better than average score.

Figure 12. Histogram for Item Q39



In general, the value of Q38 and Q39 for this study was in demonstrating a normal distribution of the survey participants in terms of their knowledge and experience with

information literacy. However, these two questions functioned more like demographic information and did not contribute to the instrument in terms of measuring implementation. As a result, I did not include these two questions in the final instrument as representing a dimension of implementation.

Section III: Questions 40-48 (3 item choice)

Questions Q40 through Q48 ask participants to identify the frequency of their engagement in activities related to information literacy. The value of the choices was: 3 = in the past month; 2 = in the past year; 1 = more than one year / Not at all. The results of the frequency distributions (Appendix R) show a right skew in all but item Q47. The right skew indicates a lower than average engagement with the activity when compared to a normal distribution for the activity. Item Q43 was right skewed but showed a greater frequency—a distribution closer to a normal distribution—when compared to the results for the other activities. This item asked participants about the frequency with which they have looked at content curriculum goals to find a connection with information literacy. Only one item, Q47, showed a normal distribution. Item Q47 asks participants about the frequency with which they have formally advocated for information literacy education in their schools.

Section IV: Questions 49-55 (Demographics)

Introduction

The demographic questions, Q49-Q55, were analyzed to see if they explain any differences in program implementation or among the sample group. A multiple comparisons, one-way ANOVA was run for each demographics with each of the four factors in the scale and against the combined four factors (ILIS). Significance was established at the $p = .05$ level. The null hypothesis for each of the demographics was that there were no differences in implementation among the schools based on the six demographic factors: school type, grade levels, school size, language proficiency, computer availability, FTE librarians, FTE Support Staff.

Q49: School Description

Demographic question Q49 asked participants how they would describe their school. Answer choices included: (1) United States Public (including magnet and charter schools), (2) United States Private or Independent, (3) International, or (Other). The frequency distribution for Q49 was: U.S. Public = 212, U.S. Private = 15, International = 94, Other = 5, Total = 326. A one-way ANOVA (Table 26) showed a statistical difference in the single factors as well as in overall implementation, a composite of the four factors (ILIS). As such, I was able to reject the null hypothesis that there was no significant difference in mean scores based on school type.

Table 26. ANOVA for Q49 (School Type)

Variable	F-Statistic	Significance Level
Factor 1: Program Development	2.68	.04*
Factor 2: School Culture	11.33	.00*
Factor 3: Curriculum & Instruction	3.90	.00*
Factor 4: Librarian as Key Implementer	6.06	.00*
ILIS: All 4 Factors	5.00	.00*

Note. * Statistical Significance

Q50: Grades Levels

Demographic question Q50 asked participants to describe the grade levels taught in their school or division. Answer choices included: (1) Elementary, (2) Middle / Junior High School, (3) High School, and (4) Other. The frequency distribution for Q50 was: Elementary = 134, Middle / Junior High = 72, High School = 63, Other = 57, Total = 326. A one-way ANOVA (Table 27) showed a statistical difference the single factors as well as in overall implementation, a composite of the four factors (ILIS). I was able to reject the null hypothesis that there was no significant difference in the mean scores based on grade levels.

Table 27. ANOVA for Q50 (Grade Levels)

Variable	F-Statistic	Significance Level
Factor 1: Program Development	5.75	.00*

Table 27 (con't)

Factor 2: School Culture	4.87	.00*
Factor 3: Curriculum & Instruction	3.97	.00*
Factor 4: Librarian as Key Implementer	2.70	.04*
ILIS: All 4 Factors	5.19	.00*

Note. * Statistical Significance

Q51: Student Numbers

Demographic question Q51 asked participants to identify the numbers of students who attend their schools or divisions. Answer choices included: (1) Fewer than 100, (2) 200-499, (3) 500-999, and (4) 1,000+. The frequency distribution for Q51 was: Fewer than 500 = 13, 200-499 = 92, 500-999 = 145, 1,000+ = 76, Total = 326. A one-way ANOVA (Table 28) showed no statistical difference in any single factor or in overall implementation, a composite of the four factors (ILIS). I failed to reject the null hypothesis, and this demographic was not included in the final instrument since the numbers of students in the school did not appear to account for differences among the sample groups.

Table 28. ANOVA for Q51 (Number of Students)

Variable	F-Statistic	Significance Level
Factor 1: Program Development	1.84	.13
Factor 2: School Culture	1.52	.20

Table 28 (con't)

Factor 3: Curriculum & Instruction	1.78	.15
Factor 4: Librarian as Key Implementer	1.64	.18
ILIS: All 4 Factors	1.82	.14

Q52: Language Proficiency

Demographic question Q52 asked participants to identify the percentage of students who are proficient in the language of instruction. Answer choices included: (1) 75—100%, (2) 50—74%, (3) 25—49%, (4) 0—24%. The frequency distribution for Q52 was: 75—100% = 203, 50—74% = 93, 25—49% = 23, 0—24% = 7, Total = 326. A one-way ANOVA (Table 29) showed statistical difference in three factors and in overall implementation, a composite of the four factors (ILIS). I was able to reject the null hypothesis based on language proficiency.

Table 29. ANOVA for Q52 (Language Proficiency)

Variable	F-Statistic	Significance Level
Factor 1: Program Development	2.85	.03*
Factor 2: School Culture	3.97	.00*
Factor 3: Curriculum & Instruction	5.53	.00*
Factor 4: Librarian as Key Implementer	1.68	.17
ILIS: All 4 Factors	4.06	.00*

* Statistical Significance

Q53: Computer Availability

Demographic question Q53 asked participants the how often an adequate number of computers is available for student use. Answer choices included: (1) Almost always, (2) Sometimes, (3) Rarely, and (4) Never. The frequency distribution for Q53 was: Almost always = 184, Sometimes = 104, Rarely = 32, Never = 6, Total = 326. A one-way ANOVA (Table 30) showed no statistical difference in any single factor or in overall implementation, a composite of the four factors (ILIS). I failed to reject the null hypothesis, and this demographic was not included in the final instrument since computer availability did not appear to account for differences among the sample groups.

Table 30. ANOVA for Q53 (Computer Availability)

Variable	F-Statistic	Significance Level
Factor 1: Program Development	1.90	.12
Factor 2: School Culture	.88	.45
Factor 3: Curriculum & Instruction	2.27	.08
Factor 4: Librarian as Key Implementer	2.15	.09
ILIS: All 4 Factors	1.95	.12

Q54: FTE Librarians

Demographic questions Q54 asked participants how many full-time equivalent (FTE) librarians work at the school. Answer choices included: (1) NO FTE Librarians,

(2) Less than 1 FTE Librarian, (3) 1 FTE Librarian, and (4) More than one FTE

Librarian. The frequency distribution for Q54 was: NO FTE Librarians = 3, Less than 1 FTE Librarian = 29, 1 FTE Librarian = 247, and More than one FTE Librarian = 47, Total = 326. A one-way ANOVA (Table 31) showed no statistical difference in three single factors and in overall implementation, a composite of the four factors (ILIS).

However, it did show a significant difference in one factor, Implementer Characteristics.

I was able to reject the null hypothesis.

Table 31. ANOVA for Q54 (FTE Librarians)

Variable	F-Statistic	Significance Level
Factor 1: Program Development	1.59	.19
Factor 2: School Culture	1.72	.16
Factor 3: Curriculum & Instruction	1.59	.19
Factor 4: Librarian as Key Implementer	4.89	.00*
ILIS: All 4 Factors	2.03	.10

Note. * Statistical Significance

Q55: FTE Support Staff

Demographic questions Q55 asked participants how many full-time equivalent (FTE) Support Staff work at the school. Answer choices included: (1) NO FTE Support Staff, (2) Less than 1 FTE Support Staff, (3) 1 FTE Support Staff, and (4) More than one FTE Support Staff. The frequency distribution for Q55 was: NO FTE Support Staff = 69,

Less than 1 FTE Support Staff = 69, 1 FTE Support Staff = 98, and More than one FTE Support Staff = 90, Total = 326. A one-way ANOVA (Table 32) showed a statistical difference in two single factors—School Culture and Curriculum & Instruction as well as in overall implementation, a composite of the four factors (ILIS). I was able to reject the null hypothesis based on FTE support staff.

Table 32. ANOVA for Q55 (FTE Support Staff)

Variable	F-Statistic	Significance Level
Factor 1: Program Development	1.11	.34
Factor 2: School Culture	7.55	.00*
Factor 3: Curriculum & Instruction	2.66	.04*
Factor 4: Librarian as Key Implementer	.92	.43
ILIS: All 4 Factors	3.00	.03*

Note. * Statistical Significance

Comparisons of Teachers with Librarians

There were two sample groups in the survey sample: teachers and librarians. To better understand the implications of including these two groups in the sample, I split the survey data. The results as shown in Table 33 indicated a slightly higher mean score for each of the four factors and for the four-factor scale ILIS and a slightly lower standard deviation for teachers when compared to librarians. Although there may appear to be differences between these two groups, the differences may be explained by other

variables. For instance, the differences in mean scores and variance may be the result of a difference in number of cases for each; the teacher sample includes 59 cases while the librarian sample includes 267. One would expect the mean and standard deviation to be less stable for a small group, so more teacher cases are needed for a more stable comparison of these two groups. Another consideration is that the teacher sample actually represents only two programs with approximately half of the cases evaluating each while theoretically the programs represented by the librarians includes a one to one correspondence. In this study, it would appear that teachers evaluated implementation in their schools' information literacy programs as higher than average.

Table 33. *Descriptive Statistics for Teachers and Librarians*

	Pop_Split	N	Mean	Std. Deviation
Program Dev.	Teacher	59	4.06	1.34
	Librarian	267	3.20	1.48
Culture	Teacher	59	5.18	1.24
	Librarian	267	3.68	1.53
Curriculum	Teacher	59	4.86	1.16
	Librarian	267	4.08	1.39
Implementer	Teacher	59	5.08	1.07
	Librarian	267	4.76	1.40
ILIS	Teacher	59	4.70	1.12
	Librarian	267	3.78	1.34

Independent t-tests were run for each sample group to see if there are differences in correlation between each of the factors and the four-factor scale with implementer activities. As shown in Table 34, teachers showed no correlation in any of the four factors or the four-factor scale. Librarians, however, showed a statistically significant negative correlation in all four factors and the four-factor scale. One explanation for this might be in the level of implementation itself. If the two school programs are as fairly well developed as the teachers seem to indicate, then the activities may be less formal, less frequent, and less systematic. If, however, an information literacy program is not effectively embedded in the curriculum or culture of the school, then the activities, which include advocacy and effort at implementation, may be greater. In this case, the person who would most likely be engaged in these efforts at implementation is the librarian in the school.

Table 34. *Correlations of Activities with Factors and Four-factor Scale (ILIS).*

	Librarians (N=267)		Teachers (N=59)	
	PEARSON r	Sig. (2-tailed)	PEARSON r	Sig. (2-tailed)
Program Development	-.17**	.00	-.06	.60
Culture	-.18**	.00	-.12	.33
Curriculum	-.17**	.00	-.06	.63
Implementer	-.34**	.00	.07	.56

Table 34 (con't)

ILIS	-.21**	.00	-.07	.58
------	--------	-----	------	-----

Note: Correlations are significance at 0.01 level.

I did not have sufficient data to run separate factor analyses for these two sample groups, and although there appear to be some differences between the groups in the results of survey administration, I think they are both important when measuring implementation and should both be included in the survey data. In fact, the results indicate that the survey could be used under different circumstances: to evaluate one program in a school by administering the survey to all of the teachers; or to evaluate multiple programs, perhaps a school district of school libraries or some other identified population by surveying just the librarians or program implementers in the school.

Finalizing the Instrument

The final instrument is shown below in Table 35. The question numbers have been adjusted for the deletions. There are three sections: the first section includes the four-factor scale; the second section includes the implementation activities; and the third section includes the demographics.

Table 35. *Finalized Instrument: Information Literacy Implementation Survey (ILIS)*

Section I: School Characteristics
Factor One: Program Articulation & Development

Table 35 (con't)

1	Assessment data is used to evaluate the effectiveness of the school information literacy program.
2	Professional development includes communication of best practice in information literacy teaching and learning.
3	Integration of information literacy skills and knowledge is tracked in the implemented curriculum.
4	Resources are allocated for information literacy professional development.
5	There is a support system—peer advisor, coach, administrative liaison—in place for librarians and teachers who are implementing information literacy programming.
6	Information literacy staff development opportunities are evaluated for their effectiveness.
7	Information literacy assessment tools are evaluated to ensure they measure the identified outcomes.
8	Priorities or emphasis for implementation of information literacy outcomes or standards are agreed upon by the educators in the school.
9	Information literacy outcomes are communicated throughout the school and community.
10	Professional development includes time for collaboration.
11	A definition of information literacy has been agreed upon by teachers, administrators, and parents.

Table 35 (con't)

Factor Two: School Culture	
12	There is a generally recognized need among the administration that students need to learn or improve their information literacy skills.
13	Information literacy is part of the school's mission statement or philosophy.
14	Teachers generally recognize that students need to learn or improve their information literacy skills.
15	Information literacy policy is communicated at the classroom level.
16	Information literacy standards and/or outcomes are included in the written or documented curriculum of the school.
17	There is an understanding among the faculty that students must and will have information literacy knowledge and skills as part of their education in the school.
18	The school administration is committed to information literacy education.
19	The school administration communicates a need for students to have information literacy skills.
Factor Three: Curriculum & Instruction	
20	Information literacy goals are defined as standards, understandings, and/or outcomes.
21	There is adequate accountability for teaching information literacy education.
22	New technologies are regularly incorporated into learning experiences.

Table 35 (con't)

23	Integration of information literacy skills and knowledge is included in expectations for unit design and lesson planning.
24	Cooperative learning, peer mentoring, and/or inquiry-based methods are used to enhance student learning.
25	Appropriate assessments of information literacy outcomes are included within units and/or lessons.
26	Appropriate assessments are used to evaluate student progress in meeting information literacy outcomes.
27	All students have many opportunities to practice and apply information literacy skills and knowledge.
28	Information literacy is part of the curriculum across all relevant curriculum areas.
29	Information literacy is part of the implemented curriculum and articulated through all grade levels.
30	Real world (authentic) problems are included in the information literacy curriculum.
<hr/> Factor Four: Librarian as Key Implementer	
31	The librarian is empowered to manage an information literacy program.
32	The librarian maintains a focus on the impact of information literacy education on student performance.

Table 35 (con't)

33	The librarian cooperates and collaborates with others on information literacy program development.
34	The librarian adapts information literacy practice to meet the needs of my particular school, culture, and institution.
Section II: Implementation Activities	
35	Updated personal competencies in information literacy through professional reading or other professional development opportunities
36	Requested, initiated, or had a meeting with a teacher or teaching colleague for the purpose of communicating, cooperating, or collaborating on information literacy instruction.
37	Modeled and promoted effective uses of technology for learning and teaching.
38	Looked at content curriculum goals to find a connection with information literacy.
39	Learned or supported the learning of a new technology or new aspect of an existing technology.
40	Advocated informally for information literacy education with a colleague or a group of colleagues or teachers.
41	Collaborated with a teaching colleague or supported teaching colleagues to plan, deliver, or assess an information literacy lesson.

Table 35 (con't)

42	Advocated formally for information literacy education in a curriculum planning session, department/team/divisional meeting, or professional organization.
----	-----------------------------------------------------------------------------------------------------------------------------------------------------------

43	Guided, encouraged, or supported students and teachers in the use of new media and technologies.
----	--------------------------------------------------------------------------------------------------

Section III: Demographics	
---------------------------	--

44.	How would you describe your school? a United States Public (Including Magnet or Charter School) b United States Private or Independent c International d Other _____
-----	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

45.	Which grade level range most closely describes the students served by the division/school to which you belong? a Elementary b Middle/Junior High School c High School d Other, please specify _____
-----	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Table 35 (con't)

46. What percentage of students is proficient in the language of instruction in your division/school?

a 75 — 100%

b 50 — 74%

c 25 — 49%

d 0 — 24%

47. How many full-time equivalent (FTE) librarians do you have in your division/school?

a No FTE Librarians

b Less than 1 FTE Librarian

c 1 FTE Librarian

d More than 1 FTE Librarian

48. How many full-time equivalent (FTE) support staff do you have in your division/school library?

a No support staff

b Less than 1 FTE support staff

c 1 FTE support staff

d More than 1 FTE support staff.

End

Chapter 5

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

The purpose of the study was to develop a valid and reliable instrument to measure implementation of an information literacy program in a school. The instrument was based upon a review of the literature on information literacy, issues of receptivity in schools, and existing measure of implementation. Dimensions of implementation and specific items to measure those dimensions were then developed for use in the survey. A Delphi was conducted to further develop and refine the list of items to be used in the instrument. Using a draft of the instrument, a pilot was conducted in order to assess the general understandability of the instrument. Survey participants were then asked to: rate the degree to which certain conditions were present in their school; assess their own knowledge and behavior related to information literacy, and identify the types of activities related to information literacy in which they had engaged over different periods of time.

Research Questions

Research Question #1

Research Question #1 asks *what are the critical factors or conditions of implementation—hereafter referred to as simply dimensions of implementation—that need to be in place for an information literacy program to be integral, essential, and systemic?* To establish a beginning point from which to answer this question, a review of the literature was conducted, followed by two rounds of a Delphi study. A survey was then constructed that consisted of sets of questions representing each of the dimensions. The dimensions were factored statistically, and the results indicated four primary factors along with additional information about the knowledge, behavior, and specific activities of the librarian.

A review of the literature mentioned in the previous paragraph resulted in a list of thirteen potential dimensions of implementation. To help me generate this initial list of implementation factors, I looked to the literature on information literacy programs, school improvement, and educational program implementation. A Delphi group comprised of experts from the field of library science and education responded to an initial list of thirteen dimensions. Although there was generally a high level of consensus among the group about the value of most of the dimension, two dimensions—adult role models and student leadership—were eliminated in the first round due to a lack of consensus. No new dimensions of implementation were introduced during the Delphi.

The dimensions remaining at the end of Round One of the Delphi—(1) community investment; (2) information literacy policy; (3) identified and defined outcomes; (4) integrated curriculum; (5) experiential learning; (6) assessment; (7) staff development; (8) program support and evaluation; (9) librarian characteristics; (10) levels of use; and (11) innovations—formed the basis of the instrument.

The first nine dimensions lent themselves to a factor analysis in which it was possible to establish statistical relationships among the items representing the factors. The factor analysis resulted in a reduction of the number of dimensions or factors from nine to four—(1) Program Articulation & Development; (2) School Culture; (3) Curriculum & Instruction; and (4) Librarian as Key Implementer—in addition to the remaining dimension of *levels of use* and *innovations*.

Research Question #2

Research question #2 asks *how can the identified critical factors or degrees of implementation be operationalized in order to measure them (i.e., what are the questions that will operationalize the critical factors or degrees of implementation)?* Again, this study answered this question through a review of the literature and the Delphi. At the completion of Round One and after identifying dimensions of implementation, a set of potential questions was developed for each of the first nine dimensions, approximately

six for each with the exception of dimension #9 on librarian characteristics that included several more. Delphi members were asked to prioritize the importance of each question for measuring the dimension. They were given an opportunity to identify each question as irrelevant and to add open-ended comments.

Dimension #10 and #11 did not lend themselves to the same type of format for measuring the dimension. To respond to dimension #10 on levels of use, Delphi members were asked to comment on whether the description of the levels made sense in terms of measuring the dimension. To respond to dimension #11 on innovations Delphi members were asked to identify the types of activities that should be included to measure innovations. After responding to the Round Two questions, Delphi members had an opportunity to respond to one another's comments and responses in two additional follow-up sessions to Round Two of the Delphi.

The Round Two results prioritizing the importance of the questions were used for item reduction, leaving four questions for dimensions #1-8, five for dimension #9, two for dimension #10, and a set of nine activities to represent dimension #11. All Delphi members participated in all rounds and follow-up sessions.

Research Question #3

Research question #3 asks *is the newly created instrument valid and reliable?* To establish the measurement validity of the instrument, the study must answer the question *does the instrument measure what we want to measure.* In this study, content validity—the degree to which the instrument covers the dimension of the concept—was addressed through the first round of the Delphi study in which experts in the field established the dimensions of implementation. Face validity—whether the instrument appears to measure what it is intended to measure—was also addressed in the Delphi study and the pilot study in which participants were asked to evaluate the general soundness of the instrument. Construct validity—results based on what we would theoretically expect—was established through the results of the factor analysis in which dimensions of implementation clustered into four primary factors that were distinguishable from one another. Concurrent validity—the use of a parallel or logically related instrument—was not established since I was not able to find an appropriate instrument to use for this purpose.

Reliability refers to the consistency of the instrument. To evaluate the reliability of the instrument, an item analysis was run in order to obtain inter-item correlations for all the items in the scale and sub-scales. In this instrument, seven out of nine Cronbach's alphas for the sub-scales (dimensions) fell between .80 and .90, a range considered very

good (DeVellis, 2003). The other two Cronbach's alphas were in the range over .90, a range considered very high. After elimination of three items and a factor analysis to determine which items clustered together, another item analysis was run on each set of items representing the four subscales in the instrument. Cronbach's alpha for each—factor 1 = .956, factor 2 = .947, factor 3 = .942, factor 4 = .822—exceeded .8, a very good range.

Research Question #4

Research question #4 asks *what demographic data can potentially explain differences in program implementation*. Research question #4 also asks *do the demographic data appear to account for differences among the sample group*. The data were analyzed in sections, the four factors that comprise the section on the school itself, and the activities that describe the behaviors of the implementers. To analyze, then, whether the demographic data account for differences among the sample groups, I used both descriptive statistics and correlational data from the demographic data as well as data for each of the two sections: *School Characteristics* and *Implementer Activities*. Those analyses are described in more detail in the following paragraphs.

I first looked at the scale ILIS including the four factors that comprise the scale. Correlations between the demographic data and *Section I: School Characteristics* of the

ILIS that showed no statistical difference ($<.05$ significance) among populations on the ILIS scale or for any single factor included: (Q51) the numbers of students in the school, and (Q53) the availability of computers. Although I cannot definitively say why the study produced these results, I can speculate as to why significance was or was not established or even what might be occurring.

In terms of the results for (Q51) the numbers of students in the school, it may be that controlling for other factors (i.e., expenditure per pupil, socio-economic conditions, language proficiency) within an answer choice would provide additional information that could reveal a difference based on student numbers. The reason for this is that within any given category, for example a small school with fewer than 200 students, there may be one school that rates high on the ILIS that has very different conditions from another school that rates low on the ILIS. These two schools simply cancel out one another or, in other words, move the category toward center. More information is needed to understand this demographic.

The results for (Q53) the availability of computers, is counter-intuitive and needs to be examined. In looking at the question itself—*Are there an adequate number of computers available for students to use in the division/school to which you belong?*—I would surmise that the structure and word choice of the question did not lend itself to

easily discriminate between schools. It is logical that most programs reflect available resources, so when asked this question, many would say they have enough or nearly enough for the current program. If this question had asked more specifically—e.g., how often or for what period of time computers are available for information literacy instruction—the results might be very different.

There was also no statistical difference between survey groups on the ILIS scale and three of the four factors for (Q54) FTE Librarian. However, there was a statistically significant difference among survey groups on *Factor 4: Librarian as Key Implementer* for (Q54) FTE Librarians. The difference showed up between the extremes of the answer range—*NO FTE Librarians* and *More than one FTE Librarian*—where the number of cases was 3 and 47 respectively. *Factor 4: Librarian as Key Implementer* is designed to measure the level of support given to the librarian as a key implementer of information literacy. These results are logical given that support cannot be given to a position that does not exist. I would also speculate that in a school where there is more than one FTE librarian to handle the management side of the facility, materials, and technology, there would also be more time and opportunity for curriculum development, collaboration, and other activities related to information literacy implementation.

It appears that some of the demographics do appear to account for differences among the survey groups. Correlations between the demographic data and *Section I: School Characteristics* of the ILIS that showed a statistical difference (<.05 significance) among survey groups on the ILIS scale or for any single factor included: (Q49) school type, (Q50) grade levels in the school, (Q52) language proficiency, and (Q55) FTE support staff.

The differences for (Q49) school type existed between the school-type categories *International* and *Other*. The numbers of cases were 94 and 5 respectively and the descriptions of schools identified as *Other* included no particular pattern of schools: ESL school, private: special education school, government school, at risk school, international with primarily one ethnic group. The school type “other” scored generally much lower in single factors and in the whole scale. Given that there were only 5 cases in the school type “other,” it is possible that statistical significance is due to anomalies in the five cases or the fact that they may be outliers. International schools scored higher than US Public Schools for the factor *School Culture*. The factor *School Culture* looks at the school community’s understandings about the need and accountability for information literacy education. This is interesting given the limitations on access to libraries and materials in English that would be typical of international schools in which the host country language

is other than English. In this case, perhaps the school community has greater reliance on electronic information sources and understands the need to develop skills and knowledge to use those resources.

The differences between survey groups for (Q50) *grade levels* were significant for the whole scale (ILIS) and for each of the four factors. The *Other* category of schools showed significant differences on the overall scale (ILIS) as well as a difference in *Factor 1: Program Development*. Descriptions for the *Other* category of schools included diverse configurations of grade ranges including but not limited to: Pre-K-12, combined middle and high school, K-8, All grades, Whole District. Etc. The data showed a difference as well between middle school and high schools in the overall scale (ILIS) as well as in *Factor 2: School Culture*. This would make sense given the typical shift from a more structured curricular program in middle school to a departmentally driven or individual teacher driven program in high school. Interestingly, it did not follow that there existed a significant difference between Elementary and High School in any factor or the overall scale.

The differences between survey groups for (Q52) *language proficiency* were statistically significant for the whole scale (ILIS) and for three of the four factors: Factor 1: Program Development, *Factor 2: School Culture*, *Factor 3: Curriculum and*

Instruction. The one factor in which the data did not show significant differences was in *Factor 4: Librarian as Key Implementer*. In every case, the difference involved the group that included a language proficiency of 0-24%. In other words, when the number of students who were proficient in the language of instruction was identified as 0-24%, then implementation was significantly lower compared to the other groups. Again, it would be important to control for other conditions that might contribute to differences in implementation in order to understand this factor better. One could surmise as well that in a school in which only 0-24% of the students are proficient in the language of instruction there would be a significant barrier to information literacy teaching and learning given that information literacy is language based and language dependent, unlike other disciplines such as mathematics in which it is easier to bridge language gaps.

The differences between survey groups for (Q55) *FTE support staff* were statistically significant for the whole scale (ILIS) and for two of the four factors: *Factor 2: School Culture*, *Factor 3: Curriculum and Instruction*. The two factors in which the data did not show a statistically significant difference were *Factor 1: Program Development*, and *Factor 4: Librarian as Key Implementer*. These results make sense when speculating as to why certain factors are affected and others are not. In terms of *Factor 1: Program Development* which focuses on designing an information literacy

program, it makes sense that the FTE of support staff would make less difference because the librarian would participate on committees or work individually or collaboratively with curriculum coordinators on program design during a relatively restricted number of hours. The other two factors, however, *Factor 2: School Culture*, and *Factor 3: Curriculum and Instruction* involve expectations and delivery of the program itself, two areas that are impacted more by the availability of the librarian to deliver that curriculum. With less FTE support staff who would presumably handle more of the daily operations of the library, less time can be devoted to information literacy planning and instruction.

The Finalized Instrument and the Literature

The finalized instrument consists of one four-factor scale, one summative scale, and a number of demographics. These sections individually and collectively reflect and satisfy various aspects of implementation and information literacy illuminated through the review of the literature.

To begin, information literacy is in many respects like any other educational program, innovation, or change. For that reason, methods for implementation that apply to other educational programs, innovations, or change could and should apply to information literacy implementation. In the finalized instrument, questions #1-34 cover four factors of implementation: program development, school culture, curriculum and

instruction, and implementer characteristics. The first three factors, which constitute the majority of questions in the survey, are concerned with characteristics or school conditions that need to be present in implementation of any program or innovation. The fourth factor, implementer characteristics and the section on implementer activities address qualities unique to or specifically related to information literacy.

Factor 1, Program Development, includes questions (Table 36) designed to measure conditions and characteristics of a clearly defined and communicated information literacy program. This section attempts to measure the degree to which the program has what Fullan (2001b) calls clarity (about goals and means), a necessary condition for successful change, as well as the degree of organizational and formal support for the program. This section includes questions about whether there is an agreed-upon definition of information literacy (Q11), a set of priorities for implementation (Q8), and communicated learning outcomes (Q9), all areas that require local definitions since the literature shows multiple ways in which information literacy can be defined and implemented. This section also includes a number of questions about the degree to which an information literacy program is supported through: professional development (Q2, Q10); resources (Q4), and teacher support (Q5). And finally, this section looks at the use of assessment data for various aspects of program improvement

including: student assessments (Q1), integration (Q3), professional development (Q6),
assessment tools (Q7)

Table 36. *Questions for Factor 1: Program Development*

Factor One: Program Articulation & Development	
Q1	Assessment data is used to evaluate the effectiveness of the school information literacy program.
Q2	Professional development includes communication of best practice in information literacy teaching and learning.
Q3	Integration of information literacy skills and knowledge is tracked in the implemented curriculum.
Q4	Resources are allocated for information literacy professional development.
Q5	There is a support system—peer advisor, coach, administrative liaison—in place for librarians and teachers who are implementing information literacy programming.
Q6	Information literacy staff development opportunities are evaluated for their effectiveness.
Q7	Information literacy assessment tools are evaluated to ensure they measure the identified outcomes.
Q8	Priorities or emphasis for implementation of information literacy outcomes or standards are agreed upon by the educators in the school.
Q9	Information literacy outcomes are communicated throughout the school and community.

Table 36 (con't)

Q10 Professional development includes time for collaboration.

Q11 A definition of information literacy has been agreed upon by teachers, administrators, and parents.

Factor 2, School Culture, includes questions (Table 37) that are designed to measure the degree to which information programs are a part of the educational culture of the school. As noted in the literature, for implementation or change to occur, there must be recognition of a need for change or a need for the innovation (Berends, Kirby, Naftel, & McKelvey, 2001; Fullan, 1998). Factor two includes a number of questions (Q12, Q14, Q17) that are designed to assess the degree to which various stakeholder groups recognize the need for information literacy instruction. Factor two also includes questions that ask about evidence of information literacy as a value of the school culture: is the need of information literacy education part of the school's mission statement or philosophy (Q13); is information literacy included in the written curriculum of the school (Q16); is the need for information literacy communicated to teachers (Q19) and students (Q15). And finally, is it understood that there is commitment by the administration to information literacy instruction (Q18). All of these questions point to what the review of the literature described as the context for change, a place where the organizational

structures of the school support the change and where the systems within the school must be structured in a way that allow for change to occur (Deal & Peterson, 1999 as cited in George, M., 2007).

Table 37. *Questions for Factor Two: School Culture*

Factor Two: School Culture

- Q12 There is a generally recognized need among the administration that students need to learn or improve their information literacy skills.
- Q13 Information literacy is part of the school's mission statement or philosophy.
- Q14 Teachers generally recognize that students need to learn or improve their information literacy skills.
- Q15 Information literacy policy is communicated at the classroom level.
- Q16 Information literacy standards and/or outcomes are included in the written or documented curriculum of the school.
- Q17 There is an understanding among the faculty that students must and will have information literacy knowledge and skills as part of their education in the school.
- Q18 The school administration is committed to information literacy education.
- Q19 The school administration communicates a need for students to have information literacy skills.
-

Factor 3, Curriculum and Instruction, includes questions (Table 38) about: ways in which information literacy is present in the curriculum (Q20, Q23, Q28, Q29), the

variety of methods and technologies used to teach in the school or classroom (Q22, Q24, Q27, Q30) and the extent to which information literacy is assessed at both the individual student level and program level (Q21, Q25, Q26). These questions cover multiple issues of receptivity in schools as discussed in the review of the literature: the relationship of clear program goals to implementation as described by Schmoker (1999) who states that only such goals will allow us to analyze, monitor, and adjust practice toward improvement; constructivism and process learning as described by Eisenberg (2004) who stresses both integration and opportunities for practice when he states that “for students to be successful in the Information Age, information literacy skills must be integrated throughout the curriculum, as well as being reinforced outside of school (p. 55); assessments as indicators of implementation described by Schmoker, “Data are to goals what signposts are to travelers: data are not end points, but are essential to reaching them—the signposts on the road to school improvement (p. 36).

Table 38. *Questions for Factor Three: Curriculum & Instruction*

Factor Three: Curriculum & Instruction

- Q20 Information literacy goals are defined as standards, understandings, and/or outcomes.
- Q21 There is adequate accountability for teaching information literacy education.
- Q22 New technologies are regularly incorporated into learning experiences.
-

Table 38 (con't)

-
- Q23 Integration of information literacy skills and knowledge is included in expectations for unit design and lesson planning.
- Q24 Cooperative learning, peer mentoring, and/or inquiry-based methods are used to enhance student learning.
- Q25 Appropriate assessments of information literacy outcomes are included within units and/or lessons.
- Q26 Appropriate assessments are used to evaluate student progress in meeting information literacy outcomes.
- Q27 All students have many opportunities to practice and apply information literacy skills and knowledge.
- Q28 Information literacy is part of the curriculum across all relevant curriculum areas.
- Q29 Information literacy is part of the implemented curriculum and articulated through all grade levels.
- Q30 Real world (authentic) problems are included in the information literacy curriculum.
-

Factor 4, Librarian as Key Implementer, addresses characteristics of implementation that are specific to information literacy. This factor has only four questions (Table 39) which all focus on aspects of implementation that assume the librarian has a key role in implementation of an information literacy program, something strongly supported in the literature. For implementation to occur, the implementers of the

program must be empowered (Q31) or have administrative support (Oberg, 2000; Taylor, 2006; Todd, 1999). The need for collaboration (Q33) as a condition of implementation of information literacy curriculum is well documented in the literature (Hurren, 1999; Loertscher & Achterman, 2002; Oberg, 1999a; Page, 1999). And finally, for implementation to occur the library program, but particularly the librarian as key implementer of the program should maintain a focus on student learning (Q32) as described in the literature on program development (American Library Association (ALA) & Association for Educational Communications and Technology (AECT), 1998).

Table 39. *Questions for Factor Four: Librarian as Key Implementer*

Factor Four: Implementer Characteristics

- Q31 The librarian is empowered to manage an information literacy program.
 - Q32 The librarian maintains a focus on the impact of information literacy education on student performance.
 - Q33 The librarian cooperates and collaborates with others on information literacy program development.
 - Q34 The librarian adapts information literacy practice to meet the needs of my particular school, culture, and institution.
-

Limitations of the Study

As with all studies this one is not without its limitations. For one, although the group of Delphi experts was chosen according to a criterion for professional expertise

and experience, they were not chosen according to any sampling method. Some members of the panel of Delphi experts self-selected to participate and others were asked to participate. The method of selection allowed for a purposeful or balanced number of participants from the academic field, the field of education, practitioners, district supervisors, publishing field, etc. which I feel served to strengthen the study, but I also acknowledge that it may also be a limitation as well.

Another limitation is the survey sample. This sample was comprised of a number of multiple groups for data gathering and analysis: two whole populations of teaching faculty from one each elementary and middle schools; the whole population of two separate school district of librarians; and the whole populations of listserv members for a number of professional librarian listservs. Although the sample size was sufficient for factor analysis, the largest group of participants—the listserv members—were a convenience sample of self-selected individuals. This method is susceptible to both coverage error—the school librarians' listservs (population frame) do not adequately represent the whole population—and sampling error—the sample group is not large enough to generalize to the whole population. In spite of the fact that some of the data—(Q38) implementer's knowledge of information literacy and (Q39) implementer's experience with information literacy—show a normal distribution of participants in their

knowledge and experience with information literacy, there is still the possibility that the method of sampling will produce an error.

Another limitation in this study comes from the field of library and information science itself. New standards and definitions around what students need to know and to be able to do are evolving. There is a rapid pace of changing technologies that runs parallel to ideas about the need to integrate these new and divergent technologies into our educational programs. This study has tried to maintain a fairly holistic view of information literacy program development, but it cannot predict future educational needs based on technologies that don't exist yet. When looking at program planning to address these needs, this study may be limited by the rate at which this field and technologies that impact the field change and develop.

And finally, this study is based upon a theoretical assumption that a systems approach to program implementation is the way to create systemic change. It does not account for that fact that there may be other approaches that may prove effective in creating system change.

Significance of the Study

The primary purpose of this research is to develop an instrument that will measure the degree of implementation of an information literacy program. To my knowledge no

instrument of this type currently exists. The evaluation tools that do exist for school libraries focus on gathering evidence of individual student learning and perceptions of the library (Everhart, 1998). This instrument evaluates information literacy programs from another angle, the degree to which information literacy is understood and accepted by the learning community of a school. As such, the newly developed instrument provide an additional tool for schools to use to evaluate information literacy as part of the library media program and as part of the whole school curriculum and culture. In other words, this instrument can be used to evaluate the degree to which the program is systemic, an “integral, essential part of the fabric of the school” as Haycock (1998) describes.

More importantly, however, than its usefulness as an evaluative tool, my hope is that the new instrument will be useful as a formative tool, as a way to analyze an individual school, school district, or demographic grouping of school programs. This instrument can be used to collect data on individual areas of strength and weakness as represented by the four factors—program articulation and development, school culture, curriculum and instruction, and implementer characteristics—and the implementer activities. The data can then be used to assist with the design of interventions to address those areas that show a need for improvement.

Another purpose for this research is to add to the body of knowledge on information literacy program implementation. Historically—and perhaps because they lack the authority to do otherwise—librarians have used a fairly grassroots approach to school improvement, one teacher or one collaborative lesson at a time. If the goal of information literacy program development is to eventually reach a level of institutionalization, then this instrument will perhaps provide some insight into a more systemic approach to implementation including identification of factors of implementation that need to be considered before that condition of implementation has been achieved.

Recommendations

Use of the Instrument

This study has produced an instrument that can be used to provide information about the attitudinal engagement and activities by an individual school or a number of schools. When assessing an individual school, the instrument should be administered to all educators responsible for curriculum delivery and development: the administration, curriculum leaders, and all teaching faculty. When assessing a school district, the instrument can and should be administered to the librarians, but it could also be

administered to the educational leaders and other faculty as well depending on the goals of assessment and the resources available.

Although this instrument provides an important piece for evaluating implementation of information literacy programs, it does not provide the whole picture and should be used in conjunction with other data collection methods and tools. For instance, student data and examples of student work provide valuable information about the learning that takes place in the school. Examples of curriculum documents, teaching guides, and assessment tools that are in use in the school contribute to the picture of what is happening in the classroom in the area of information literacy instruction. These kinds of data are important because they are tangible evidence of information literacy teaching and learning that can and do occur within individual classrooms, departments, grade levels or schools even when there is no recognition that the learning is related to the concept of information literacy. In other words, information literacy learning can take place—although I would argue not at a systemic level—even when there is no understanding or recognition of it by the school community

My hope would be that the information collected from administering the instrument would be used as formative data to help program implementers design interventions in specific areas that will promote greater program implementation. The

instrument could be used for program evaluation as well, but evaluation without corresponding interventions to correct deficiencies or areas of concern will not lead to greater implementation. The demographic questions used in this study may or may not be appropriate to use in another assessment and should be used when appropriate for the context of the school or group of schools with which the assessment is used. For instance

It would be a misuse of this instrument to use it to evaluate the performance of a school librarian or any other individual. One assumption in this study is that information literacy is a school program in which the library and librarian have a key role. The instrument is designed to assess community engagement in the implementation of a school program across the school and in the context of the school culture, community, and curriculum, all of which operate outside of the sphere of influence of any one single person. If the performance of the librarian is to be evaluated in terms of information literacy program development, the expectations and criteria for evaluating that performance would need to be established. Using this instrument as a basis for librarian evaluation would be placing unrealistic accountability on one person within the learning community.

Further Research

The goal of this study was to create a valid and reliable instrument to measure implementation of an information literacy program. It was not to assess implementation of a particular group of schools or library programs. An area for future research would be to use the instrument to assess the degree and specific areas of implementation for various groups of schools or school library programs. In addition, a limited number of demographics were used in this study, some of which showed statistical differences among the survey groups. To understand and substantiate those differences and more, additional research is needed.

When this study is replicated, there are several recommendations I would make. First of all, I would conduct the Delphi by having the participants themselves create the initial list of dimensions and questions used to operationalize the dimensions. This may produce a more extensive list of dimensions and questions from which the group can then work toward consensus. To increase the value of the information from the implementer activities section, I would recommend increasing the sensitivity of the item answers, perhaps to five using something like: (1) in the past week, (2) in the past month, (3) in the past semester, (4) In the past year, (5) Never.

More research is needed that will highlight efforts at systemic implementation of information literacy programs including programs in which information literacy is integrated with information technology in the form of an information and communications technology (ICT) program. Using the instrument from this study in that type of research would require reworking the questions in order to incorporate additional items related to technology in both the factor sections and the activities. For example, although the items representing dimensions were designed to reflect current theory on program implementation in general, they also incorporated strategies or perspectives that are closely associated with information literacy theory and practice, such as the use of collaboration as a means for integrating information literacy knowledge and skills. Assuming that information technology—or information and communications technology (ICT)—has its own set of theory and practice, these would need to be reflected in the items that comprise a revised instrument.

And finally, more research is needed to understand the influences that move educational innovations from theoretical and academic conception to local and systemic implementation. Who or what influences adoption of an innovation or the decision to let an innovation fall by the wayside? And to take it back even farther, how do innovations even make it to the awareness level of the administrators and educators who would

implement them? As an international educator in which opportunities for professional development are much more limited, these questions are ones that I believe are important for continuous program development and for the ultimate goal, student learning.

References

- American Association of School Librarians (AASL). (2007). *Standards for the 21st-century learner* [Brochure]. Chicago: ALA. Retrieved February 22, 2008, from American Library Association (ALA) Web site: <http://www.ala.org/>
- American Association of School Librarians (AASL), & Association for Educational Communications and Technology. (1988). *Information power: Guidelines for school library media programs*. Chicago: ALA.
- American Association of School Librarians (AASL), & Association for Educational Communications and Technology (AECT). (1998). *Information power: Building partnerships for learning* (Rev. ed.). Chicago: ALA.
- American Library Association. (1998, March). *A progress report on Information Literacy: An update on the American Library Association (ALA) Presidential Committee on Information Literacy: Final report* (Report). Retrieved July 10, 2005, from <http://www.ala.org>
- American Library Association (ALA). (2004). *Your school library media program and no child left behind (NCLB)* [Brochure]. Chicago, IL: ALA. Retrieved March 21, 2006, from <http://www.ala.org/AASLNCLBbrochureweb.pdf>

- Asselin, M. (2005, January). Teaching information skills in the information age: An examination of trends in the middle grades. *School Libraries Worldwide*, 11(1), 17-36.
- Asselin, M., & Naslund, J., Jr. (2000). A case study of partners in educational change: Teacher-librarians and pre-service teachers. In *Papers presented at the 29th annual conference*. Symposium conducted at International Association of School Librarianship (IASL), Seattle, WA. Retrieved March 10, 2008, from IASL Web site: <http://www.iasl-online.org/>
- Austrom, L. (1999). Secondary school assignments: Cooperatively planned and taught. In K. Haycock (Ed.), *Foundations for effective school library media programs* (pp. 228-244). Greenwood Village, CO: Libraries Unlimited.
- Berends, M., Kirby, S. N., Naftel, S., & McKelvey, C. (2001). *Implementation and performance in New American Schools*. Santa Monica, CA: RAND.
- Burns, T. (1961). Micropolitics: Mechanisms of organizational change. *Administrative science quarterly*, 6, 257-281.
- Callison, D. (2006, February). Questioning revisited. *School Library Media Activities Monthly*, 22(6), 40-43. Abstract retrieved May 30, 2006, from Library, Information Science & Technology Abstracts database. (19831471)

Callison, D., & Preddy, L. (2006). *The blue book on information age inquiry, instruction, and literacy*. Westport, CT: Libraries Unlimited.

Carroll, F. L. (1981). *Recent advances in school librarianship*. New York: Pergamon Press.

Character Plus: School Home Community. (2005). Retrieved July, 2005, from CHARACTERplus Web site: <http://www.characterplus.org>

Compaine, B. M. (2001, July). *Re-examining the digital divide*. Massachusetts Institute of Technology (MIT): Internet and Telecoms Convergence Consortium. Retrieved July 18, 2005, from MIT Sloan School of Management Web site: <http://ebusiness.mit.edu>

Cooperating School District. (1999). *Evaluation resource guide: Tools and strategies for evaluation of a character education program* [Brochure]. St. Louis, MO: Cooperating School District.

Deal, T. E., & Peterson, K. D. (1999). *Shaping School Culture*. San Francisco: Jossey Bass.

Delbecq, A. L., Van de Ven, A. H., & Gustafson, D. H. (1975). *Group techniques for program planning: A guide to nominal and Delphi processes*. Glenview, IL: Scott, Foresman and Co.

- Denbow, K. (2004). The role of school culture in the implementation of a character education program. *Dissertation Abstracts International*, 65 (06), 2034A. (AAT No. 3137694) Abstract retrieved September 19, 2005, from Proquest Dissertations and Theses - Full Text database (766276431): <http://marian.sandiego.edu>
- Dept. of Labor, Washington, DC Secretary's Commission on Achieving Necessary Skills. (1991). *What work requires of schools: A SCANS report for American 2000*. Washington, D.C.: U.S. Dept. of Labor. (ERIC Document Reproduction Service No. ED332054) Retrieved July 10, 2005, from ERIC database.
- DeVellis, R. F. (2003). *Scale development: Theory and applications* (2nd ed.). Applied social research methods series; v.26. Thousand Oaks, CA: Sage Publication.
- Doiron, R., & Davis, J. (1998). *Partners in learning: Students, teachers, and the school library*. Englewood, CO: Libraries Unlimited.
- Doyle, C. S. (1994). *Information literacy in an information society: A concept for the information age*. (Monograph). (ERIC Document Reproduction Service No. ED372763) Retrieved from ERIC database.
- Duffield, C. (1993). The Delphi technique: A comparison of results obtained using two expert panels. *International Journal of Nursing Studies*, 30(3), 227-237. Abstract retrieved October 11, 1993, from CINAHL Plus database. (1993167980)

- Eisenberg, M., Berkowitz, B., & Murray, J. (2000, November/). Applying Big6 skills and information literacy standards to internet standards. *Book Report, 19*(3), 33.
Retrieved February 25, 2008, from Academic Search Premier database. (3720574)
- Eisenberg, M. B., & Brown, M. K. (1992). Current themes regarding library and information skills instruction: Research supporting and research lacking. *School Library Media Quarterly, 20*(2), 103-109.
- Eisenberg, M. B., Lowe, C. A., & Spitzer, K. L. (2004). *Information literacy: Essential skills for the information age*. Westport, CT: Libraries Unlimited.
- Everhart, N. (1998). *Evaluating the school library media center*. Westport, CT: Libraries Unlimited.
- Fenton, R. (2002). *Status of standards implementation in Anchorage secondary schools: A Concerns Based Acceptance Model (CBAM) Review, 2001-2002* (Rep. No. BBB24259). (ERIC Document Reproduction Service No. ED466645) Retrieved October 7, 2006, from ERIC database.
- Frey, B. B., & Schmitt, V. L. (2007, Spring). Coming to terms with classroom assessment. *Journal of Advanced Academics, 18*(3), 402-423. Retrieved February 25, 2008, from Academic Search Premier database. (26214808)

- Frost, C. (2005, May/). Library leaders: Your role in the professional learning community. *Knowledge Quest*, 33(5), 41-42.
- Fullan, M. (2001a). *Leading in a Culture of Change*. San Francisco, CA: Jossey Bass.
- Fullan, M. (2001b). *The New Meaning of Educational Change* (3rd ed.). New York: Teachers' College Press.
- Fullan, M. G., & Stiegelbauer, S. (1991). *The new meaning of educational change* (2nd ed.). London: Cassell.
- George, M. P., White, G. P., & Schaffer, J. J. (2007). Implementing school-wide behavior change: Lessons from the field. *Psychology in the Schools*, 44(1), p 41-51. Retrieved December 8, 2007, from ISI Web of Knowledge database.
- Hair, J. F., Jr., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis*. Upper Saddle River, NJ: Prentice-Hall International.
- Hall, G. E., & Hord, S. M. (1987). *Change in schools: Facilitating the process*. Albany, NY: State University of New York Press. (Original work published 1984)
- Harada, V. H., & Yoshina, J. M. (2004, October). Moving from rote to inquiry. *Library Media Connection*, 23(2), 22-25. Abstract retrieved May 30, 2006, from Library Media Connection database (14588713).

- Harris, A. (2001). Building the capacity for school improvement. *School Leadership and Management, 21*(3), 261-270. Retrieved October 21, 2007, from Academic Search Premier database. (5392942)
- Harris, A. (2006). *Improving schools and educational systems: International perspectives*. New York: Routledge.
- Harris, L., Lee, J. H., & Raines, G. (Eds.). (2000). *Washington notes: News of the U.S. educational technology policy and legislation*. International Society for Technology in Education (ISTE). Retrieved July 19, 2005, from ISTE Web site: <http://www.iste.org>
- Hasson, F. (2000). Research guidelines for the Delphi survey. *Journal of Advanced Nursing, 32*(4), 1008-1015.
- Haycock, C. A. (1988). Cooperative program planning: A model that works. *Emergency Librarian, 16*(2), 29-38.
- Haycock, K. (1998). Research in Teacher-Librarianship. In *Foundations for effective school library media programs* (pp. 12-24). Greenwood Village, CO: Libraries Unlimited.

Hurren, P. (1999). Expanding the collaborative planning model. In K. Haycock (Ed.),

Foundations for effective school library media programs (pp. 182-188).

Greenwood Village, CO: Libraries Unlimited.

Information and Communication Technology (ICT) (n.d.). *Succeeding in the 21st*

Century: What higher education must do to address the gap in information and

communication technology proficiencies. Princeton, New Jersey: Information and

Communication Technology (ICT). Retrieved July 11, 2005, from Educational

Testing Service Web site: <http://www.ets.org//.html>

Information & Communication Technology (ICT) Literacy Assessment. (n.d.).

Educational Testing Service (ETS). Retrieved July 7, 2005, from

<http://www.ets.org/>

Information literacy competency standards for higher education. (2000, January 18).

Retrieved June 9, 2008, from Association of College & Research Libraries Web

site: <http://www.ala.org//acrlstandards/iteracycompetency.cfm>

International ICT Literacy Panel (n.d.). *Information & Communication Technology*.

Retrieved July 13, 2005, from Educational Testing Service (ETS) Web site:

<http://www.ets.org//.html>

ISTE's educational technology standards for students. (n.d.). *iste*. Retrieved June 4, 2008,

from International Society for technology in education Web site:

http://www.iste.org/Content/Standards/_for_Students_2007.htm

Jairath, N., & Weinstein, J. (1994). The Delphi methodology: A useful administrative

approach. *Canadian Journal of Nursing Administration*, 7, 29-42.

Jerkins, D., & Smith, T. (1994). Applying Delphi methodology in family therapy

research. *Contemporary Family Therapy*, 16, 411-430. Abstract retrieved October

11, 2007, from PsycINFO database. (1995-08114-001)

Johnson, D., & Eisenberg, M. (1999). Computer Literacy and Information Literacy: A

Natural Combination. In *Foundations for Effective School Library Media*

Programs (p. 141). Greenwood Village, CO: Libraries Unlimited.

Joyce, M. Z., & Tallman, J. I. (2006). *Making the writing and research connection with*

the I-search process: A how-to-do-it manual (2nd ed.). New York: Neal-

Schuman.

Katz, I. R. (2007, September). Testing information literacy in digital environments:

ETS's iSkills assessment. *Information Technologies & Libraries*, 26(3), 3-12.

Retrieved February 27, 2008, from Academic Search Premier Database.

(27544085)

- Keegan, B., & Westerberg, T. (1991, May). Restructuring and the school library: Partners in an information age. *NASSP Bulletin*, 75(535), 9-14. Retrieved February 25, 2008. doi:10.1177/
- Kuhlthau, C. C. (1991). Inside the research process: Information seeking from the user's perspective. *Journal of the American Society for Information Science*, 42(5), 361-371.
- Kuhlthau, C. C. (1997). Learning in digital libraries: An information search process approach. *Library Trends*, 45(4), 708-724. Retrieved February 24, 2008, from Academic Search Premier Database. (9710022609)
- Lemmons, K. (2005, May/). Technology matters. *Knowledge Quest*, 33(5), 48-49.
- Lickona, T. (1996, March). Eleven principles of effective character education. *Journal of Moral Education*, 25(1), 93-100. Retrieved September 19, 2005, from ERIC database (EJ533384): <http://marian.sandiego.edu>
- Linstone, H., & Turoff, M. (1975). *The Delphi method: Techniques and applications*. Reading, Mass.: Addison-Wesley Pub. Co.
- Loertscher, D. V., & Achterman, D. (2002). *Increasing academic achievement: A guide for teachers*. San Jose, CA: Hi Willow Research & Publishing.

- Loertscher, D. V., & Woolls, B. (2002). *Information literacy: A review of the research: A guide for practitioners and researchers* (2nd ed.). San Jose, CA: Hi Willow Research and Publishing.
- Madaus, G. F., & O'Dwyer, L. M. (1999, May). A short history of performance assessment: Lessons learned. *Phi Delta Kappa*, 80(9), 688-695. Retrieved February 26, 2008, from Academic Search Premier Database. (1832514)
- Marcoux, E. L. A. (1999). *Information literacy standards for student learning: A modified Delphi study of their acceptance by the educational community*. Unpublished doctoral dissertation, The University of Arizona, Tucson, Arizona. Retrieved July 6, 2005, from Dissertations and Theses Full Text database.
- Market Tools, Inc. (1999-2007). *Zoomerang: Easiest way to know, fastest way to ask*. Retrieved June, 2005, from <http://zoomerang.com>
- McNamara, J. F., Erlandson, D. A., & McNamara, M. (1999). *Measurement & evaluation: Strategies for school improvement*. Larchmont, NY: Eye On Education.
- Meyers, L. S., Gamst, G., & Guarino, A. J. (2006). *Applied multivariate research*. Thousand Oaks, CA: SAGE Publications.

Milbury, P. (2005, May/). Collaboration: Ten important reasons to take it seriously.

Knowledge Quest, 33(5), 30-32.

Milstein, M. M. (1993). *Restructuring schools: Doing it right*. Newbury Park, CA:

Corwin Press.

Mitchell, C., & Sackney, L. (2000). *Relationships in the study of learning communities*.

The Netherlands: Swets & Zeitlinger.

Montiel-Overall, P. (2005, July). A theoretical understanding of teacher and librarian

collaboration. *School Libraries Worldwide: Theory, Research, Practice:*

International Association of School Librarianship (IASL), 11(2), 24-48.

Moore, P. (2005, July). An analysis of information literacy education worldwide. *School*

Libraries Worldwide: Theory, Research, Practice: International Association of

School Librarianship (IASL), 11(2), 1-23.

Morris, B. J. (2005, May/). The emerging school library media center: From the past into

the future. *Knowledge Quest*, 33(5), 22-26.

Murphy, M. K., Black, N., Lamping, D. L., McKee, C. M., Sanderson, C., Askham, J., et

al. (1998). Consensus development methods and their use in clinical guideline

development. *Health Technology Assessment*, 2(3).

National Center for Educational Statistics. U.S. Department of Education. (2005, January). *School library media centers: Selected results from the educational longitudinal study of 2002* (Rep. No. 2005-302). Retrieved March 21, 2006, from <http://nces.ed.gov//.pdf>

National Education Goals Panel. (1993). *National education goals report: Building a nation of learners. Volume one: The National Report, 1993*. Washington, D.C.: United States. (ERIC Document Reproduction Service No. ED360394) Retrieved July 19, 2005, from ERIC database.

National Education Technology Standards for Students (NETS). (n.d.). *ISTE: International Society for Technology in Education* (nets for students). Retrieved October 31, 2005, from <http://www.iste.org>

National Study of School Evaluation (NSSE). (1998). *Program evaluation: Library media services*. Schaumburg, IL: NSSE.

Newmann, F., Brandt, R., & Wiggins, G. (1998, August/). An exchange of views on "Semantics, psychometrics, and assessment reform: A close look at 'authentic assessments.'" *Educational Researcher*, 27(6), 19-22. Retrieved February 26, 2008, from JSTOR database: <http://www.jstor.org>

- Newmann, F. M., & Wehlage, G. G. (1993, April). Five standards of authentic instruction. *Educational Leadership*, 50(7), 8-12. Retrieved February, 2008, from Academic Search Premier database. (9306035024)
- Oberg, A. (1999a). The school librarian and the classroom teacher: Partners in curriculum planning. In K. Haycock (Ed.), *Foundations for effective school library media programs* (pp. 167-174). Greenwood, CO: Libraries Unlimited.
- Oberg, D. (1999b). The school library program and the culture of the school. In *Foundations for effective school library media programs* (chap. 4). Greenwood Village, CO: Libraries Unlimited.
- Oberg, D. L., Hay, L., & Henri, J. (2000). The role of the principal in an information literate school community. *School Library Media Research*, 3. Retrieved March 11, 2008, from American Association of School Librarians (AASL) Web site: <http://www.ala.org/////cfm>
- Page, C.-A. (1999). *Foundations for effective school library media programs* (K. Haycock, Ed.). Greenwood Village, CO: Libraries Unlimited.
- Pappas, M. (2000, May). Pathways to Inquiry. *School Library Media Activities Monthly*, 16(9), 23. Retrieved February 24, 2008, from Academic Search Premier Database. (3091019)

Plotnick, E. (1999, February). *Information literacy* (Monograph). (ERIC Document
Reproduction Service No. ED427777) Retrieved February 9, 2008, from
<http://www.ericdigests.org/-4/information.htm>

Powell, C. (2003, February). The Delphi technique: Myths and realities. *Journal of
Advanced Nursing*, 41(4), 376-382. Retrieved February 17, 2006, from Academic
Search Premier Database. (9079422)

Presidential committee on information literacy: Final report. (1989, January 10). (ERIC
Document Reproduction Service No. 315028) Retrieved July 11, 2005, from
Association of College & Research Libraries (ACRL) Web site:
<http://www.ala.org>

*A progress report on information literacy: An update on the American Library
Association Presidential Committee on information literacy: Final report*. (1998,
March). Retrieved July 11, 2005, from Association of College & Research
Libraries (ACRL) Web site: <http://www.ala.org>

Rosenholtz, S. (1989, March). Workplace conditions that affect teacher quality and
commitment: Implications for teacher induction programs. *The Elementary
School Journal*, 89(4), 421-439.

- Rosenholtz, S. J. (1991). *Teachers' workplace: The social organization of schools*. White Plains, NY: Longman. (Original work published 1989)
- Rowe, E. (1994). *Enhancing judgment and decision making: A critical and empirical investigation of the Delphi technique*. Unpublished doctoral dissertation, University of Western England, Bristol.
- Salant, P., & Dillman, D. A. (1994). *How to conduct your own survey: Leading professionals give you proven techniques for getting reliable results*. New York: John Wiley & Sons, Inc.
- Salvaterra, M. E., & Adams, D. C. (1998, April). *Implementing block scheduling: A concern-based model of change*. (ERIC Document Reproduction Service No. ED421781) Retrieved from ERIC database.
- Sarason, S. (1990). *The Predictable Failure of Educational Reform*. San Francisco: Jossey Bass.
- Schack, G. D. (1993, April). Involving students in authentic research. *Educational Research*, 50(7), 29. Retrieved February 25, 2008, from Academic Search Premier Database. (9306035030)

Schmoker, M. (1999). *Results: The Key to Continuous School Improvement* (2nd ed.).

Alexandria, VA: Association for Supervision and Curriculum Development
(ASCD).

School libraries work! (Monograph No. SMGPSLP015). (2006). [Www.scholastic.com/](http://www.scholastic.com/):

Scholastic Research & Results.

Senge, P. M., Cambron-McCabe, N., Lucas, T., Smith, B., Dutton, J., & Kleiner, A.

(2000). *Schools that learn*. New York: Doubleday/.

Seymour, C. (2007, May/). Information technology assessment: A foundation for school

and academic library collaboration. *Knowledge Quest*, 35(5), 32-35. Retrieved

March 28, 2008, from Academic Search Premier Database. (26673573)

Shannon, D. M., & Davenport, M. A. (2001). *Using SPSS to solve statistical problems: A*

self-instruction guide. Upper Saddle River, NJ: Prentice Hall, Inc.

Shapiro, J. J., & Hughes, S. K. (1996, March/). Information literacy as a liberal art:

Enlightenment proposals for a new curriculum. *Educom Review*, 31(2). Retrieved

February 22, 2008, from Educause Web site: <http://www.educause.edu/////html>

Spitzer, K. L., Eisenberg, M. B., & Lowe, C. A. (1998). *Information literacy: Essential*

skills for the information age. Washington, D.C.: Office of Educational

Improvement.

Sprinthall, R. C. (1994). *Basic Statistical Analysis* (4th. ed.). Boston: Allyn and Bacon.

(Original work published 1982)

SPSS (Version 16.0) [Computer software]. (2007). Chicago, IL: SPSS Inc.

Stripling, B. (2004, Fall). Using inquiry to explode myths about learning and libraries.

CSLA Journal, 28(1), 15-17. Abstract retrieved May 30, 2006, from Library,

Information Science & Technology Abstracts Database. (20182741)

Stripling, B. K., & Pitts, J. M. (1988). *Brainstorms and blueprints: Library research as a thinking process*. Englewood, CO: Libraries Unlimited.

Sutton, S. (n.d.). *References to Information Literacy in State Department of Education*

Web Sites. Los Angeles: Pacific Bell /UCLA Initiative for 21st. Century

Literacies. Retrieved July 10, 2005, from University of California, Los Angeles

Web site: <http://www.newliteracies.gseis.ucla.edu>

Taylor, J. (2006). *Information Literacy and the School Library Media Center*. Westport,

CT: Libraries Unlimited.

Thomas, N. (2000, September). A multiplicity of (research) models: Alternative

strategies for diverse learners. *School Library Media Activities Monthly*, 17(1),

25-26.

- Thomas, N. P. (1999). *Information literacy and information skills instruction: Applying research to practice in the school library media center*. Englewood, CO: Libraries Unlimited.
- Thornton, S. (2008, February). Pedagogy, politics and information literacy. *Politics*, 28(1), 50-56. Retrieved February 27, 2008, from Academic Search Premier Database. (27894091)
- Todd, R. (2001, July). *Transitions for preferred futures of school libraries*:. Virtual conference presented at School Libraries OnLine, International Association of School Librarianship (IASL), Auckland, New Zealand.
- Todd, R., Kuhlthau, C. C., & OELMA. (n.d.). *Student Learning through Ohio School Libraries: The Ohio Research Study*. Retrieved February 21, 2004, from Ohio Educational Library Media Association Web site: <http://www.oelma.org//.asp>
- Todd, R. J. (1995, Winter). Integrated information skills instruction: Does it make a difference? *School Library Media Quarterly (SLMQ)*, 23(2). Retrieved July 10, 2005, from American Library Association Web site: <http://www.ala.org//>
- Todd, R. J. (1999, March). Transformational leadership and transformational learning: Information literacy and the world wide web. *NASSP Bulletin*, 4-12. Retrieved March 11, 2008. doi:10.1177/

- van Deusen, & Donham, J. (1995, September/). Prerequisites to flexible planning. *Emergency Librarian*, 23(1), 16-19. Retrieved April 22, 2008, from Academic Search Premier database. (9510125395)
- West, M. (2000, February). Supporting School Improvement: observations on the inside, reflections from the outside. *School Leadership & Management*, 20(1), 43-60. Retrieved April 22, 2008, from Academic Search Premier database. (3034943)
- Wiggins, G. (1997, January). Practicing what we preach in designing authentic assessments. *Educational Leadership*, 54(4), 18-25. Retrieved March, 2008, from Academic Search Premier Database. (9703070945)
- Wilson, P., Blake, M., & Lyders, J. (1999). Principals and teacher-librarians: A study and a plan for partnership. In K. Haycock (Ed.), *Foundations for effective school library media programs* (pp. 271-278). Greenwood Village, CO: Libraries Unlimited.
- Yucht, A. H. (2000, September). Strategy: Flip-it! For collaborative planning strategies. *Teacher Librarian*, 28(1), 48. Retrieved February 23, 2008, from Academic Search Premier database. (3686674)

Zweizig, D. L., & Hopkins, D. M. (1999, November). *The United States National Library Power school program: Research evaluation and implications for professional development and library education*. Paper presented at Third International Forum on Research in School Librarianship, Annual Conference of the International Association of School Librarianship (IASL), Birmingham, AL. (ERIC Document Reproduction Service No. 437055) Retrieved April 22, 2008, from ERIC database.

Appendix A
Expert Group Introductory Letter

[Date]

Dear [Participant Name],

I am a faculty member at Taipei American School and a doctoral student at the University of San Diego. I am writing to see if you would be interested in participating in an expert group to provide feedback on the development of an instrument to assess the level of implementation of an information literacy program. Developing and validating this instrument has become the focus of my dissertation work at the University of San Diego, and I would be honored if you would agree to participate.

This process should not be very time-consuming. Feedback will be gathered and distributed using a quasi-Delphi approach. This involves a series of sequential questionnaires interspersed by controlled feedback from other group members. The goal is to move toward the most reliable consensus of opinion of a group of experts. I expect no more than 2 main rounds although some communication may be needed between rounds in order to clarify additional information gathered during the round. Each main round should take about 30 minutes to complete. I plan to send the first round questionnaire once the members of group have been identified, approximately around mid-January. The second and last round should be completed by mid-March.

You may be assured that every effort will be made to ensure complete confidentiality. Participants will be assigned an identification number when providing feedback to the whole expert group. Your name will never appear on any questionnaire or any other communication during the study.

My hope is that this study—the development of an instrument to measure the degree of implementation of an information literacy program—will make an important contribution to the field of school library science and curriculum planning. If done well, this instrument has the potential to impact a school librarian or curriculum planner's ability to assess the strengths and weaknesses of an information literacy program and to measure the degree to which that program has been implemented. I hope that you agree with the potential value of this work and that you will agree to participate.

I would appreciate it if you could reply to this email to let me know if you wish to participate. In as much as possible, I need participants to commit to completing all rounds of questionnaires once we start.

Please feel free to email me with questions or concerns at aianic@tas.edu.tw or aianic@hotmail.com.

Sincerely,

Candace Aiani

Doctoral Candidate, University of San Diego

Appendix B
Cover Letter for Delphi: Round One

[Date]

Dear [Participant Name],

Thank you for your patience as I needed extra time to prepare for this Delphi and, of course, for agreeing to participate in this study. This email begins the first of two rounds of the Delphi phase of the study. Please read this message in its entirety before completing the Delphi questionnaire. This message provides directions for completing informed consent as well as directions for completing the questionnaire.

In order to ensure confidentiality, your personal identification number is [insert id# here].

Informed consent. Please open and read the attached Informed Consent Form. After reading the form, please use the reply buttons at the top of this email to indicate that you have: (1) Read & Agree or (2) Read & Do Not Agree. I must have your reply to the informed consent form to consider your questionnaire. If you respond Read & Do Not Agree, stop and do not complete the questionnaire.

Directions for completing the Questionnaire

Please find time to complete the whole survey in one sitting as you cannot “save for later” once you begin the questionnaire. The entire questionnaire should take between 20-60 minutes depending on the length or your comments for the questions. To find the questionnaire, click [here](#) or enter the following link in your web browser. <

<http://www.zoomerang.com/survey.zgi?p=WEB226D89QQG2Z>>

Once you have accessed the Zoomerang site, click on “START SURVEY!” to begin. Enter your personal identification number which you can find toward the top of this message.

Follow the directions for each section of the questionnaire. In general the questionnaire asks you to respond by indicating the degree to which a school or librarian characteristic is important when implementing an information literacy program in a school. You are able to add comments or qualify your answers in the space provided after each item. When you have finished the questionnaire, please click on the “submit” button.

When all participants have completed the questionnaire, I will compile and share the results. You will have an opportunity to modify your answers or make additional comments at that time.

If you have any questions before you begin, you can reach me using the contact information below. Thank you again for taking time from your busy schedule to assist me with my research.

Regards,

Candace Aiani

Phone: (+886-2) 2873-9900 #364 or #241

Fax: (+886-2) 2873-1641

Email: aianic@tas.edu.tw

Appendix C
Research Participant Consent Form: Delphi Participants

Research Participant Consent Form: Delphi Participants

Developing an Instrument to Measure the Degree of Implementation of School Information Literacy Programs

Candace Aiani is a doctoral student in Educational Leadership at the School of Leadership and Educational Sciences at the University of San Diego. You are invited to participate in a research project she is conducting for the purpose of exploring the creation of an instrument to measure program implementation in the area of school information literacy program development.

The project will involve participation in a series of rounds for a Quasi-Delphi study in which you will fill out a questionnaire for each round that asks questions about information literacy program implementation. The questionnaire will take about 20 to 30 minutes per round and the number of rounds will be no more than four. The questionnaire also may include some questions about you, such as your area of professional expertise and years of experience. The questionnaire will be distributed electronically via email and can, therefore, be completed in a location of your choosing. Participation is entirely voluntary and you can refuse to answer any question and/or quit at any time. Should you choose to quit, no one will be upset with you and your information will be destroyed right away. If you decide to quit, nothing will change about my personal and professional respect for you as an expert in this field.

The information you give will be analyzed and studied in a manner that protects your identity. That means that a code number will be used and that your real name will not appear on any of the study materials. All information you provide will remain confidential and locked in a file cabinet in the researcher's office for a minimum of five years before being destroyed.

There may be a risk that filling out a questionnaire may make you feel tired. Remember, you can stop completing the questionnaire at any time you feel tired or for any other reason.

The benefit to participating will be in knowing that you helped school librarians and school administrators learn how to better help people with developing information literacy programs that will benefit student learning

If you have any questions about this research, please contact Candace Aiani at (+886-2) 2873-9900 or at aianic@tas.edu.tw. You may also contact Candace's Faculty Advisor, Dr. Fred Galloway, at the University of San Diego (619) 260-7435 or at <Galloway@sandiego.edu>.

I have read and understand this form, and consent to the research it describes to me. I have received a copy of this consent form for my records.

Signature of Participant

Date

Name of Participant (Printed)

Signature of Principal Investigator

Date

Appendix D
Questionnaire for Round One of the Delphi

Information Literacy Expert Group - Round One

1

In order to facilitate discussion later, please enter your personal identification number here. It can be found in the body of the email message that linked to this survey.

The purpose of this survey is to have a group of experts (you) identify those characteristics or conditions that are important for implementation (and measurement) of an information literacy program.

Each question includes a box for comments. Do not feel obliged to include comments for each question but feel free to use them at will to clarify or qualify.

Your responses will be shared with the Delphi group later and you will all have an opportunity to modify your positions based on the whole group response.

For Questions 2-11, please rate the importance of each school characteristic or condition for implementing an information literacy program. You may add comments to explain your answer in the box provided.

2

How important is community investment when implementing an information literacy program?

1	2	3	4	5
Not important at all	Somewhat unimportant	May or may not be important	Somewhat important	Extremely important

Community Investment: School stakeholders--students, teachers,

administrators, and parents--build consensus around goals and priorities for information literacy.

1 2 3 4 5
Additional Comment



3

How important is information literacy policy when implementing of an information literacy program?

1 2 3 4 5
Not important Somewhat May or may not Somewhat Extremely
at all unimportant be important important important

Information Literacy Policy: Information literacy is part of the school's philosophy, goal, or mission statement, including formal or written policy adopted by the school board. The policy should be communicated and supported at the classroom level.

1 2 3 4 5
Additional Comment



4

How important are identified and defined outcomes when implementing an information literacy program?

1 2 3 4 5
Not important Somewhat May or may not Somewhat Extremely
at all unimportant be important important important

Identified and Defined Outcomes: Information literacy goals are identified and defined as standards, understandings, and/or

outcomes. Definitions of the outcomes and priorities for emphasis are agreed upon by the stakeholder groups. Outcomes are communicated and visible throughout the school and community.

1 2 3 4 5
Additional Comment

	▲
	▼

5

How important is an integrated curriculum when implementing an information literacy program?

1	2	3	4	5
Not important at all	Somewhat unimportant	May or may not be important	Somewhat important	Extremely important

Integrated Curriculum: Information literacy is part of the curriculum at all grade levels and across all curriculum areas. Curriculum integration is purposeful and intentional, included in unit design and lesson planning. The integration is documented in the written curriculum and tracked in the implemented curriculum.

1 2 3 4 5
Additional Comment

	▲
	▼

6

How important is experiential learning when implementing an information literacy program?

1	2	3	4	5
Not important at all	Somewhat unimportant	May or may not be important	Somewhat important	Extremely important

Experiential Learning: Students have many opportunities to practice and apply the outcomes of information literacy. Real-world information problems are included in the curriculum and new information technologies are incorporated into learning experiences through a process of constant renewal. Cooperative learning, peer mentoring, and inquiry-based experiences may be important approaches for maximizing learning. Experiential learning includes adequate time for reflection and peer-to-peer sharing of learning experiences.

1 2 3 4 5
Additional Comment

	▲
	▼

7

How important is assessment when implementing an information literacy program?

1 2 3 4 5
Not important at all Somewhat unimportant May or may not be important Somewhat important Extremely important

Assessment: Appropriate assessments are used to evaluate student progress. Assessments include--but are not limited to--authentic, performance-based activities. Assessment tools should be evaluated frequently to ensure that they measure the educational objectives being taught. Assessment data should be used to evaluate and improve the program.

1 2 3 4 5
Additional Comment

	▲
	▼

8

How important are adult role models when implementing an information literacy program?

- 1 Not important at all
- 2 Somewhat unimportant
- 3 May or may not be important
- 4 Somewhat important
- 5 Extremely important

Adult Role Models: Adults within the school community, especially teachers and administrators, model the skills and thinking that are inherent in the objectives for information literacy. Adults need to model systemically and intentionally.

1 2 3 4 5
Additional Comment

▲

▼

9

How important is staff development when implementing an information literacy program?

- 1 Not important at all
- 2 Somewhat unimportant
- 3 May or may not be important
- 4 Somewhat important
- 5 Extremely important

Staff Development: Significant time and resources are allocated for professional development. Professional development should include time for program development as well as the writing and updating of individual units and lessons plans.

1 2 3 4 5
Additional Comment

▲

▼



10

How important is student involvement and leadership when implementing an information literacy program?

1	2	3	4	5
Not important at all	Somewhat unimportant	May or may not be important	Somewhat important	Extremely important

Student Involvement and Leadership: Peer coaching, teaching, and leadership are important components of information literacy. Students and teachers are learners together in the face of ever-changing technologies, so students are involved in all aspects of the program.

1	2	3	4	5
Additional Comment				

11

How important is program support and evaluation when implementing an information literacy program?

1	2	3	4	5
Not important at all	Somewhat unimportant	May or may not be important	Somewhat important	Extremely important

Program Support & Evaluation: Information literacy education must be sustained through on-going evaluation. Program evaluation includes such things: level of commitment from the top; adequate funding; support for curriculum personnel; high-quality and on-going professional development; and a networking and support system for educators who are implementing the program.

1	2	3	4	5
Additional Comment				

For questions 12-14, please rate in your opinion the importance of each library condition or librarian characteristic when measuring implementation of an information literacy program. You may add comments to explain your answer in the box provided.

12

How important are each of the following library or librarian characteristics when implementing an information literacy program?

1	2	3	4	5
Not important at all	Somewhat unimportant	May or may not be important	Somewhat important	Extremely important

(a) The librarian's level of awareness of or interest in information literacy program development?

1
2
3
4
5

Additional Comment

(b) The librarian's knowledge or experience with information literacy?

1
2
3
4
5

Additional Comment

(c) The librarian's sense of being able to manage an information literacy program?

1 2 3 4 5
Additional Comment

	▲
	▼

(d) An organizational structure (schedule, space, etc.) to manage and organize an information literacy program?

1 2 3 4 5
Additional Comment

	▲
	▼

(e) A school or librarian's focus on the impact of information literacy education on student performance?

1 2 3 4 5
Additional Comment

	▲
	▼

(f) The degree to which the librarian is cooperating and collaborating with others on information literacy?

1 2 3 4 5
Additional Comment

	▲
	▼

(g) Adapting the innovation to meet the needs of his/her particular school, culture, or institution?

1 2 3 4 5

Additional Comment

	▲
	▼

13

For any educational innovation, there are those who communicate the innovation (They educate others on its use.) and those who are the users of the innovation (They use the innovation in their teaching.) Assuming the librarian is the "user" of information literacy programs, how important is the librarian's Level of Use (LoU) for measuring implementation of an information literacy program?

1	2	3	4	5
Not important at all	Somewhat unimportant	May or may not be important	Somewhat important	Extremely important

Librarian's Level of Use (LoU): definitions and descriptions of behaviors associated with different levels of use: nonuse, orientation, preparation, mechanical use, routine, refinement, integration, and renewal.

1 2 3 4 5

Additional Comment

	▲
	▼

14

How important is it to know the innovations that are being used when measuring implementation of an information literacy program?

1	2	3	4	5
Not important at all	Somewhat unimportant	May or may not be important	Somewhat important	Extremely important

Innovations during Implementation: As programs are implemented, users often innovate in order to adapt the program to their particular school or culture. Innovations describe what the program looks like after its adoption and are a record of what librarians actually do.

1 2 3 4 5

Additional Comment

For question #15, please mark all that apply. Additional suggestions can be made in the comments box under #16.

15

What demographic information (if any) should be collected that might explain differences among schools in the degree of implementation of an information literacy program? You may use the comment box in #15 to explain your answers or add additional demographics and/or comments.

- Grades Served: Elem, Secondary, Etc.
- School Size
- School Type: US Public, International
- School Location: Country, State, Etc.
- Librarian Education/Certification
- Other, please specify

Provide additional suggestions or commentary in this section. Are there other dimensions of implementation that should be considered? Can you suggest other demographics that might explain differences among implementation?

16

Comments....

A black arrow-shaped button pointing to the right with the word "SUBMIT" written in white capital letters inside.

Appendix E
Delphi: Round One Follow-up Email

Dear Delphi participant,

All of the responses for Round 1 are now in. There is a high level of consensus on some items and a variation of views on others. To complete Round 1, you will now have an opportunity to see all of the results from all Delphi members including comments and explanations. Having read the results from other members of the group, you may wish to modify your original response on individual questions. You will have that opportunity to do so now. When all members have had an opportunity to modify responses, Round One will be complete.

Instructions:

1. Open the attached two documents:
 - *Delphi-Round 1 Summary*. This document summarizes responses for the whole group including all comments. The responses are highlighted in green. Do not modify this document, but use it for your reference.
 - *[Id]Delphi 1 Responses*. This document includes your individual responses. Your responses are highlighted in green. Use this document to compare your responses to those of the group.
2. Make the desired modifications: In the yellow highlighted box following each section, you may modify your original answer. If you do not want to modify an answer, leave the space blank. There are additional demographic suggestions in question #15. Please respond *yes* or *no* to these.
3. Save the document with your modifications and email back to me at aianic@hotmail.com or aianic@tas.edu.tw.
4. The goal for completion of this phase is about two weeks or around August 24. If that is not realistic for you, simply let me know.

I am hoping that the highly stylized formatting in these documents opens legibly for all of you, but let me know right away if you have any trouble with them.

Sincerely,

Candace Aiani

aianic@hotmail.com or aianic@tas.edu.tw

Phone: (Taiwan) (+886-2) 2873-9900 #364

Fax: (Taiwan) (+886-2) 2873-1641

Appendix F

Delphi: Round Two Introductory Email

Dear Delphi Participant,

You will receive round 2 shortly. This round will take a bit longer than the last one to complete, but should not take more than 30-60 minutes to complete.

Your personal identification is [insert]. Be sure to save this number, so you can enter it in the first question.

I have attached the results of Round One for your information. I eliminated two dimensions from Round One: Adult Role Models and Student Leadership. I also kept three of the dimensions which all six respondents agreed on: (1) grades served, (2) school size, and (3) school type.

Regards,

Candace Aiani

Email: aianic@tas.edu.tw

Email: aianic@hotmail.com

Appendix G
Delphi: Round Two Instructions

Dear [participant name] – Round 2.

In Round One of this quasi-Delphi study, you identified important characteristics or conditions for implementation of an information literacy program. In this round, you will be asked to identify behaviors or indicators that demonstrate those important characteristics or conditions. Again, each question or series of questions includes a comments box. As in round 1, your responses will be shared with the Delphi group later and you will have an opportunity to modify your position based on the whole group response.

I have provided approximately five-six statements for each dimension that describe behaviors or conditions. The goal for the final instrument is to have 3-5 behaviors that are good indicators of the dimension.

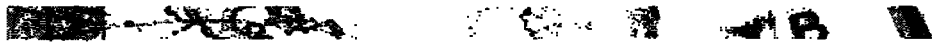
Note: To avoid further technical issues with submitting, this survey is designed to save frequently. You may return to the survey to complete results in more than one sitting. You may use the back button to return to previous pages but only within the same session.

If you have any questions, email me at aianic@hotmail.com

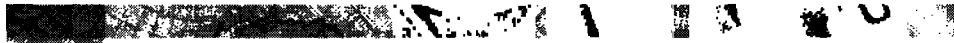
Regards,
Candace

Appendix H
Questionnaire for Round Two of the Delphi

Delphi - Round 2



Thank you in advance for completing the survey.

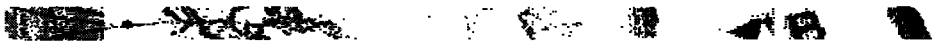


1

Please enter your personal identification number here. It can be found in the body of the introductory email message that preceded this survey.



Delphi - Round 2



Directions for pages 3-10 (questions #2-16):

Each page gives the name of a dimension in bold print. The statements below each dimension represent topics and specific questions that could be used to measure that dimension.

Please do the following:

1. Rank order the statements for their value in measuring the given dimension. The ranking runs from best (beginning with 1) to the worst.
2. If a statement does not--in your opinion--measure the dimension. mark it as "irrelevant."
3. Optional: In the comments box make a suggestion for other ways of measuring that dimension.



Delphi - Round 2

2

Rank order the statements for their value in measuring **Community Investment**

1 2 3 4 5 6 Irrelevant

(a) **Recognized need by students:** To what degree is there a generally recognized need among the students to learn or improve their information literacy skills?

(b) **Recognized need by teachers:** To what degree is there a generally recognized need among the teachers that students need to learn or improve their information literacy skills?

(c) **Recognized need by administration:** To what degree is there a generally recognized need among the administration that students need to learn or improve their information literacy skills?

(d) **Communicated Need:** To what degree has the school administration communicated a need for students to have information literacy skills?

(e) **Understanding around Need:** To what degree is there an understanding among faculty that students must and will have information literacy knowledge and skills as part of their education in the school?

(f) **Stakeholder involvement:** To what degree have all the stakeholders are involved in formulating goals and priorities for information literacy.

3

Include comments or suggestions for **Community Investment** here.

5

Include comments or suggestions for **Information Literacy Policy** here.

[Empty text box for comments]



Delphi - Round 2

6

Rank order the statements for their value in measuring **Identified and Defined Outcomes**.

1 2 3 4 5 6 Irrelevant

(a) **Information Literacy Defined**: A definition of information literacy has been identified and agreed upon by all stakeholder groups.

(b) **Specific Goals**: Information Literacy goals are identified and defined as standards, understandings, and or outcomes.

(c) **Agreed definitions**: Definitions of the outcomes are agreed upon by the stakeholder groups.

(d) **Set priorities**: Priorities for implementation and emphasis are agreed upon by the stakeholder groups.

☐ ☐ ☐ ☐ ☐ ☐ ☐

(e) **Communicated Outcomes**: Outcomes are communicated throughout the school and community.

☐ ☐ ☐ ☐ ☐ ☐ ☐

(f) Visibility: Outcomes are visible throughout the school and community.

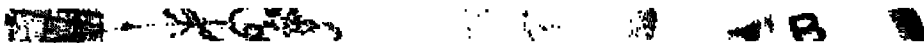


7

Include comments or suggestions for **Identified and Defined Outcomes** here.



Delphi - Round 2



8

Rank order the statements for their value in measuring **Integrated Curriculum**.

1 2 3 4 5 6 Irrelevant

(a) Curriculum Articulation: Information literacy is part of the implemented curriculum and articulate through all grade levels.



(b) Curriculum integration: Information literacy is part of the curriculum across all relevant curriculum areas.



(c) Purposeful Integration: Integration is purposeful and intentional.



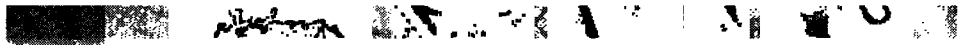
(d) Curriculum Development: Integration is included in unit design and lesson planning.



(e) Written Curriculum: Integration is documented in the written curriculum.



(f) Accountability: Integration is tracked in the implemented curriculum.



9

Include comments or suggestions for Integrated Curriculum here.

Empty text box with scroll arrows on the right side.



Delphi - Round 2



10

Rank order the statements for their value in measuring Experiential Learning.

1 2 3 4 5 6 Irrelevant

(a) Learning opportunities: Students have *many* opportunities to practice and apply IL outcomes.



(b) Equal opportunities: *All* students have opportunities to practice and apply IL outcomes.



(c) Real World Relevancy: Real world problems are included in the information literacy curriculum.



(d) Dynamic Programming: New technologies are regularly incorporated

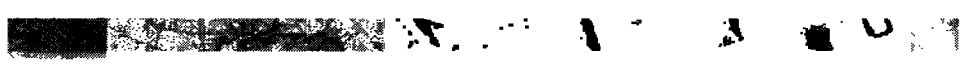
into learning experiences.



(e) Methodologies: Cooperative learning, peer mentoring, and/or inquiry-based methods are used to enhance student learning.



(f) Educational Reflection: Students are provided adequate time for reflection and peer-to-peer sharing of learning experiences.



11

Include comments or suggestions for Experiential Learning here.

Empty text box for comments or suggestions.



Delphi - Round 2



12

Rank order the statements for their value in measuring Assessment.

- 1
- 2
- 3
- 4
- 5
- 6
- Irrelevant

(a) Appropriate assessment: Appropriate assessments are used to evaluate student progress in meeting IL outcomes.



(b) Point-of-learning assessments: Appropriate assessments of IL outcomes are included at the point of learning: within units and/or lessons.



(c) Variety of assessments: Assessments include-but are not limited to-- authentic, performance-based activities.



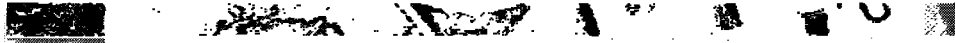
(d) Assessments of the assessments: Assessments tools are evaluated to ensure they measure the identified outcomes.



(e) Use of assessment data: Assessment data is used to evaluate and improve the program.



(f) Communication of assessment data: Assessment data is communicated to the stakeholder groups.



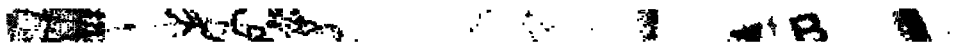
13

Include comments or suggestions for Assessment here.

Empty rectangular text input box



Delphi - Round 2



14

Rank order the statements for their value in measuring Staff Development.

1 2 3 4 5 6 Irrelevant

(a) Staff Development Investment: Time and resources are allocated for information literacy professional development.



(b) Time for Collaboration: Professional development includes time for collaboration and program development.



(c) Time for Curriculum writing: Professional development includes time for writing and updating individual units and lessons.



(d) On-going Staff Development: Professional development includes communication of innovations and best practice in information literacy education.



(e) Use of Experts: Professional development includes the use of consultants or experts in the field of information literacy education.



(f) Evaluation of Staff Development: Staff development opportunities are evaluated for their effectiveness and relevancy.

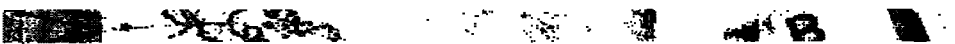


15

Include comments or suggestions for **Staff Development** here.



Delphi - Round 2



16

Rank order the statements for their value in measuring **Program Support and Evaluation**.

- 1
- 2
- 3
- 4
- 5
- 6
- Irrelevant

(a) Program evaluation: Information literacy programs are sustained through on-going evaluation at the building level.



(b) Administrative commitment: The school administration is committed to information literacy education.



(c) Adequate funding: Information literacy education receives adequate funding for resources, curriculum development, and professional development.



(d) Flexible scheduling: The instructional schedule supports best practice in information literacy education, collaboration, and common planning.



(e) Accountability: There is adequate accountability for implementing and teaching information literacy education.



(f) Professional support: There is a networking and supporting system for educators who are implementing information literacy programming.



17

Include comments or suggestions for **Program Support and Evaluation** here.



Delphi - Round 2



Delphi group instructions:

A number of **Librarian Characteristics** were identified by the group as potential predictors of differences in implementation of an information literacy program. Rank order the characteristics from the one with the greatest potential influence on program implementation to the least.



18

Note: The instrument will ask the respondent to indicate the degree to which the following statements describe them or the librarian in the school. It will look something like this: *For each of the statements below, indicate the degree to which this is true of you (or the librarian at your school) right now.*

1 2 3 4 5 6 7 Irrelevant

(a) I (or the librarian in my school) have a high level of awareness and interest in information program development.



(b) I--or the librarian in my school--have a high level of knowledge or experience with information literacy.



(c) I or the librarian in my school have/has a strong sense of being able to manage an information literacy program.



(d) My school has an adequate organizational structure (schedule, space, etc.) to manage and organize an information literacy program.



(e) My focus or that of the librarian in the school is on the impact of information literacy education on student performance.



(f) I--or the librarian in my school--cooperate and collaborate with others on information literacy.



(g) I or the librarian in my school adapt information literacy practice to meet the needs of my particular school, culture, and institution.



19

Include comments or suggestions for Librarian Characteristics here.

Delphi - Round 2



Delphi group instructions

Levels of Use was identified by the group as important for measuring implementation of an information literacy. In the question below, I have described various levels of use (modified from CBAM). In the comments sections, please respond to the following:

1. Does the question make sense to you?
2. Are the category choices clear and distinct?
3. Other comments or suggestions?

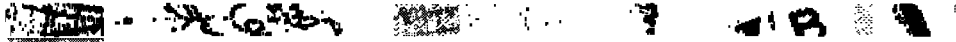


Note: The respondents will be asked to rate the degree to which the descriptions are true for them.

Levels of use:

- (a) Nonuse: I have little or no knowledge of information literacy. I have not and do not anticipate learning about or using information literacy education.
- (b) Pre-use: I am acquiring information about information literacy through written materials, orientation sessions, observing others and / or training sessions. I am preparing to use it for the first time.
- (c) On-going use: I have an established or stable program that runs in a fairly routine fashion. I generally write and deliver all the information literacy lessons with which students are engaged.

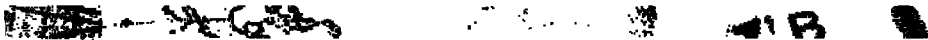
- (d) Integration: I work with teaching colleagues to create and deliver lessons that are integrated into or coordinated with their classroom activities and lessons.
- (e) Modifications: I am re-evaluating information literacy learning to find modifications or alternatives that will achieve greater student learning for my population.



20

1. Does the question make sense to you?
2. Are the choices clear and distinct?
3. Other comments or suggestions?

Delphi - Round 2



Delphi group instructions:

Knowing what librarians actually do was identified by the group as important for measuring implementation of an information literacy. In the questions below, I have described three general activities related to the three basic ideas-- collaboration, leadership, and technology--that underlie the vision for information literacy program development as outlined in *Information Power*. In the comments sections, please respond to the following:

1. Does the question make sense to you?
2. Are the choices clear and distinct?
3. Other comments or suggestions?



21

Which of the following activities describe actions you (or the librarian in your school) have taken in the past two weeks that involve collaboration?

Check all that apply:

- Requested or initiated a collaboration meeting with a teaching colleague.

Looked at content curriculum goals to find a connection with information literacy.

Collaborated with a teaching colleagues to deliver an information literacy lesson.

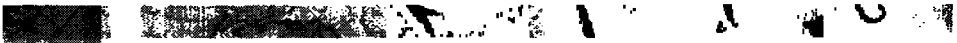
Other, please specify _____



22

Delphi Group: Please comment on "Collaboration" here.

[Empty text box for comment]



23

Which of the following activities describe actions you (or the librarian in your school) have taken in the past two weeks that involve leadership. Check all that apply:

Advocated informally for information literacy education with a colleague or group of colleagues.

Advocated formally for information literacy education in a curriculum planning session or meeting or professional organization.

Updated personal competencies in information literacy through professional reading or other professional development opportunities.

Other, please specify _____



24

Delphi Group: Please comment on "Leadership" here.



25

Which of the following activities describe actions you (or the librarian in your school) have taken in the past two weeks that involve technology. Check all that apply:

- Guided students and teachers in the use of new media and technologies.
- Modeled and promoted effective uses of technology for learning and teaching.
- Learned a new technology or new aspect of an existing technology.
- Other, please specify



26

Delphi Group: Please comment on "Technology" here.



Delphi - Round 2



Delphi group instructions:
A number of specific **Demographics** were identified by the group as potential predictors of differences in implementation of an information literacy program. Six demographic questions were included below. In the comment section below each question, please respond to the following:

1. Does the question make sense to you?
2. Are the choices clear and distinct?
3. Other comments or suggestions?

27

How would you describe your school?

- United States Public School
- United States Private, Magnet, or Charter School
- International Non-Profit or Proprietary School
- Other, please specify

28

Delphi Group: Please comment on "type of school" here.

29

How many students attend your school?

- Fewer than 400 students
- 400-800 students
- Greater than 800

30

Delphi Group: Please comment on "school size" here.

31

Which grade level range most closely describes the students served by your school.

- Elementary (Grades K-5)
- Middle/Junior High School (Grades 6-8)
- High School (Grades 9-12)
- Other, please specify

32

Delphi Group: Please comment on "grades served" here.



Appendix I
Delphi: Round Two Follow-up Email

From: aianic@hotmail.com
Subject: Delphi Group - Follow up to Round 2
Date: Mon, 15 Oct 2007 20:29:21 +0800

Dear Delphi Members,
Please send me an email right away to let me know that you have received this email message. I would appreciate it if you could finish your thoughts on Round Two by Friday, October 26.

I have compiled the results from Round Two which I am sending you now:

(1) *Doc 1 - Round Two Summary W Participants Comments*.

To analyze the results for Round Two, I assigned a value to each of the priority rankings. In this first document, I inserted the tables of raw data for each dimension and the comments by the Delphi members related to that dimension. I highlighted the top four questions for all (except one) of the dimensions. The highlighted cells represent the questions that will be retained for the final instrument. You most likely won't recognize what all the abbreviated headings mean in the table, so I put them in a second document for you.

Note: I need additional input on one of the Dimensions in which it wasn't clear what to retain and what to eliminate. Please look at Dimension 8: Program Support and Evaluation. Three cells are highlighted in green and all received a scoring of 14. Which two (2) of these do you feel are most important for measuring the dimension and should be retained for the instrument?

(2) Doc 2 - Questions Retained & Eliminated.

This document is basically a summary of the ideas and concepts that will go into the final instrument. I grouped the ideas and concepts that will be retained and those that will not. I incorporated some suggestions for word-smithing, and I highlighted some of those in the text. Please look at the questions that will be retained and those that will be eliminated and give me your last thoughts on these.

Also, I had three additional demographic questions to consider for the instrument

per your input in Round One. I would appreciate your thoughts on the question and the categories of answers.

Most sincerely,

Candace Aiani

aianic@tas.edu.tw

aianic@hotmail.com

(+886-2) 2872-9712

Appendix J
Delphi: Results from Round Two

D1: Community or Recognized Need

Questions Retained

- Recognized need by teachers: To what degree is there a generally recognized need among the teachers that students need to learn or improve their information literacy skills?
- Recognized need by administration: To what degree is there a generally recognized need among the administration that students need to learn or improve their information literacy skills?
- Communicated Need: To what degree has the school administration communicated a need for students to have information literacy skills?
- Understanding around Need: To what degree is there an understanding among faculty that students must and will have information literacy knowledge and skills as part of their education in the school?

Questions Eliminated

- Recognized need by students: To what degree is there a generally recognized need among the students to learn or improve their information literacy skills
- Stakeholder involvement: To what degree have all the stakeholders are involved in formulating goals and priorities for information literacy.

D2: School Policy

Questions Retained

- School's mission: Information Literacy is part of the school's mission statement or philosophy.
- Written curriculum: Information literacy education is included in the written curriculum.
- School Board Adoption: Policy related to information literacy education has been adopted by the school board.
- Adequate Support: Information Literacy policy is communicated and supported at the classroom level.

Questions Eliminated

- Stakeholder investment: Information literacy policy was formulated with stakeholder feedback and participation.
- Policy Incentives: There are incentives in place to promote policy related to information literacy.

D3: Identified and Defined Outcomes

Questions Retained

- IL Defined: A definition of information literacy has been identified and agreed upon by all stakeholder groups.
- Specific Goals: Information Literacy goals are identified and defined as standards, understandings, and/or outcomes.
- Set priorities: Priorities for implementation and emphasis are agreed upon by the stakeholder groups.
- Communicated Outcomes: Outcomes are communicated throughout the school and community.

Questions Eliminated

- Agreed definitions: Definitions of the outcomes are agreed upon by the stakeholder groups.
- Visibility: Outcomes are visible throughout the school and community.

D4: Integrated Curriculum

Questions Retained

- Curriculum Articulation: Information literacy is part of the implemented curriculum and articulate through all grade levels.
- Curriculum integration: Information literacy is part of the curriculum across all relevant curriculum areas.
- Curriculum Development: Integration is included in unit design and lesson planning.
- Accountability: Integration is tracked in the implemented curriculum.

Questions Eliminated

- Purposeful Integration: Integration is purposeful and intentional.
- Written Curriculum: Integration is documented in the written curriculum.

D5: Experiential Learning

Questions Retained

- Learning opportunities: All students have many opportunities to practice and apply IL outcomes.
- Real World Relevancy: Real world problems are included in the information literacy curriculum.

- Dynamic Programming: New technologies are regularly incorporated into learning experiences.
- Methodologies: Cooperative learning, peer mentoring, and/or inquiry-based methods are used to enhance student learning.

Questions Eliminated

- Equal opportunities: *All* students have opportunities to practice and apply IL outcomes.
- Educational Reflection: Students are provided adequate time for reflection and peer-to-peer sharing of learning experiences.

D6: Assessment

Questions Retained

- Appropriate assessment: Appropriate assessments are used to evaluate student progress in meeting IL outcomes.
- Point-of-learning assessments: Appropriate assessments of IL outcomes are included at the point of learning: within units and/or lessons.
- Assessments of the assessments: Assessments tools are evaluated to ensure they measure the identified outcomes.
- Use of assessment data: Assessment data is used to evaluate and improve the program.

Questions Eliminated

- Assessments include-but are not limited to--authentic, performance-based activities.
- Communication of assessment data: Assessment data is communicated to the stakeholder groups.

D7: Staff Development

Questions Retained

- Staff Development Investment: Time and resources are allocated for information literacy professional development.
- Time for Collaboration: Professional development includes time for collaboration and program development.
- On-going Staff Development: Professional development includes communication of innovations and best practice in information literacy education.

- Evaluation of Staff Development: Staff development opportunities are evaluated for their effectiveness and relevancy.

Questions Eliminated

- Time for Curriculum writing: Professional development includes time for writing and updating individual units and lessons.
- Use of Experts: Professional development includes the use of consultants or experts in the field of information literacy education.

D8: Program Support and Evaluation

Questions Retained

- Administrative commitment: The school administration is committed to information literacy education.
- Adequate funding: Information literacy education receives adequate funding for resources, curriculum development, and professional development.
- Accountability: There is adequate accountability for implementing and teaching information literacy education.
- Professional support: There is a networking and supporting system for educators who are implementing information literacy programming.

Questions Eliminated

- Program evaluation: Information literacy programs are sustained through on-going evaluation at the building level.
- Flexible scheduling: The instructional schedule supports best practice in information literacy education, collaboration, and common planning.

D9: Librarian Characteristics

Questions Retained

- I--or the librarian in my school--have a high level of knowledge or experience with information literacy.
- I or the librarian(s) in my school have/has a strong sense of being able to manage an information literacy program.
- My focus or that of the librarian in the school is on the impact of information literacy education on student performance.
- I--or the librarian in my school--cooperate and collaborate with others on information literacy.
- I or the librarian in my school adapts information literacy practice to meet the needs of my particular school, culture, and institution.

Questions Eliminated

- I (or the librarian in my school) have a high level of awareness and interest in information program development.
- My school has an adequate organizational structure (schedule, space, etc.) to manage and organize an information literacy program.

D10: Levels of Use

The respondents will be asked to rate the degree to which the descriptions are true for them.

Levels of use:

- (a) Nonuse: I have little or no knowledge of information literacy. I have not and do not anticipate learning about or using information literacy education.
- (b) Pre-use. I am acquiring information about information literacy through written materials, orientation sessions, observing others and / or training sessions. I am preparing to use it for the first time.
- (c) On-going use: I have an established or stable program that runs in a fairly routine fashion. I generally write and deliver all the information literacy lessons with which students are engaged.
- (d) Integration: I work with teaching colleagues to create and deliver lessons that are integrated into or coordinated with their classroom activities and lessons.
- (e) Modifications: I am re-evaluating information literacy learning to find modifications or alternatives that will achieve greater student learning for my population.

D11: Implemented Use (What librarians actually do)

The respondents will be asked to rate the degree to which the descriptions are true for them.

Which of the following activities describe actions you (or the librarian in your school) have taken in the past two weeks that involve collaboration? Check all that apply:

- Requested or initiated a collaboration meeting with a teaching colleague.
- Looked at content curriculum goals to find a connection with information literacy.
- Collaborated with a teaching colleague to plan, deliver, or assess an information literacy lesson.
- Other, please specify _____

Which of the following activities describe actions you (or the librarian in your school) have taken in the past two weeks that involve leadership? Check all that apply.

- Advocated informally for information literacy education with a colleague or group of colleagues.
- Advocated formally for information literacy education in a curriculum planning session or meeting or professional organization.
- Updated personal competencies in information literacy through professional reading or other professional development opportunities.
- Other, please specify_____

Which of the following activities describe actions you (or the librarian in your school) have taken in the past two weeks that involve technology? Check all that apply.

- Guided students and teachers in the use of new media and technologies.
- Modeled and promoted effective uses of technology for learning and teaching.
- Learned a new technology or new aspect of an existing technology.
- Other, please specify_____

Demographics

Demographics Retained

- How would you describe your school?
 - United States Public, Magnet, or Charter School
 - United States Private or Independent School
 - International Private Independent, or Proprietary School
 - Other
- How many students attend your school?
 - Fewer than 200
 - 200-500
 - 500-1,000
 - More than 1,000
- Which grade level range most closely describes the students served by your school?
 - Elementary (Grades Pre-K-5)
 - Middle/Junior High School (Grades 6-8)
 - High School (Grades 9-12)
 - Other, please specify _____
- What percentage of students is fluent in the language of instruction in your school?
 - 80 – 100%
 - 60 -- 80%

- 40 – 60%
 - Less than 40%
- How often are an adequate number of computers available for students to use in your school?
 - Almost always
 - Sometimes
 - Rarely
 - Never
- How many Full-Time Equivalent (FTE) librarians and staff do you have in your school?
 - No FTE Librarians and Staff
 - Less than 1 FTE Librarian and Staff
 - 1-2 FTE Librarian and Staff
 - More than 2 FTE Librarian and Staff

Appendix K
Pilot: Guiding Questions

Guiding Questions for Pilot

What is your general impression of the instrument?

Is the instrument understandable?

Does the format make sense?

Are the questions clear? Do any questions need clarification?

Are the answer choices clear and appropriate?

Is there a wide enough range of answer choices? Too wide?

Does the survey measure what it is intended to measure in your opinion?

Are there areas left out or areas in which you wanted to clarify but couldn't?

Is there anything about the survey that you would change to make it more understandable or useful?

Appendix L
Research Participant Consent Form: Pilot Test Participants

Research Participant Consent Form: Pilot Test Participants

Developing an Instrument to Measure the Degree of Implementation of School Information Literacy Programs

Candace Aiani is a doctoral student in Educational Leadership at the School of Leadership and Educational Sciences at the University of San Diego. You are invited to participate in a research project she is conducting for the purpose of exploring the creation of an instrument to measure program implementation in the area of school information literacy program development.

The project will involve filling out a survey related to information literacy program implementation and completing an interview that asks questions about your impression of the survey. The survey will take 30 to 60 minutes to complete, and the interview will last about 20 to 30 minutes, and also may include some questions about you, such as your area of professional expertise and years of experience. The survey will be distributed or accessed electronically and can, therefore, be completed in a location of your choosing. The interview will take place at a time and place convenient for you. Participation is entirely voluntary and you can refuse to answer any question and/or quit at any time. Should you choose to quit, no one will be upset with you and your information will be destroyed right away. If you decide to quit, nothing will change about my personal and professional respect for you as a professional in this field.

The information you give will be analyzed and studied in a manner that protects your identity. That means that a code number will be used and that your real name will not appear on any of the study materials. All information you provide will remain confidential and locked in a file cabinet in the researcher's office for a minimum of five years before being destroyed.

There may be a risk that filling out a questionnaire may make you feel tired. Remember, you can stop completing the questionnaire at any time you feel tired or for any other reason.

The benefit to participating will be in knowing that you helped school librarians and school administrators learn how to better help people with developing information literacy programs that will benefit student learning.

If you have any questions about this research, please contact Candace Aiani at (+886-2) 2873-9900 or at aianic@tas.edu.tw. You may also contact Candace's Faculty Advisor,

Dr. Fred Galloway, at the University of San Diego (619) 260-7435 or at
<Galloway@sandiego.edu>.

I have read and understand this form, and consent to the research it describes to me. I
have received a copy of this consent form for my records.

Signature of Participant

Date

Name of Participant (**Printed**)

Signature of Principal Investigator

Date

Appendix M
Listserv Moderator Letter

[Date]

Dear Listserv Moderator of [listserv name],

I am writing to seek permission to post a message on [listserv name] to ask listserv members to participate in a school library-related study.

I am a practicing, international school, library-media specialist and a doctoral student in Leadership Studies at the University of San Diego. I am currently conducting research in information literacy program development. With permission, I would like to extend an invitation to members of [listserv name] to participate in the study by completing a survey.

Is there a protocol for securing permission to conduct voluntary participation by listserv members? If so, could you please provide the steps I must follow and a contact name with an email address?

Most sincerely,
Candace Aiani

Appendix N
Email/Posting to Introduce the Survey

Dear [participant group],

I am writing to ask for your support with my research on information literacy program implementation.

I am a doctoral student in Leadership Studies at the University of San Diego. I am attempting to validate a survey to measure implementation of an information literacy program in a school. The draft survey takes no more than 20 minutes to complete, and individual participants' emails are strictly confidential. Your participation would be of great value and very much appreciated.

To complete the survey, click on the link below or copy it into your internet browser:

<http://www.zoomerang.com/survey.zgi?p=WEB227H9M7QNGC>

If you have any questions about this research, please contact Candace Aiani at (+886-2) 2873-9900 or at aianic@tas.edu.tw or aianic@hotmail.com. Note:

I am currently working at Taipei American School in Taiwan, so the above phone number and email are international.

You may also contact my Faculty Advisor, Dr. Fred Galloway, at the University of San Diego (619) 260-7435 or at galloway@sandiego.edu.

Regards,

Candace Aiani

Doctoral Student, University of San Diego Upper School Librarian, Taipei American School

Appendix O
Research Participant Consent Form: Survey

Research Participant Consent Form: Survey

Developing an Instrument to Measure the Degree of Implementation of School Information Literacy Programs

Candace Aiani is a doctoral student in Educational Leadership at the School of Leadership and Educational Sciences at the University of San Diego. You are invited to participate in a research project she is conducting for the purpose of exploring the creation of an instrument to measure program implementation in the area of school information literacy program development.

The project will involve filling out a survey related to information literacy program implementation. The survey will take 30 to 60 minutes to complete, and also may include some questions about you, such as your area of professional expertise and years of experience. The survey will be distributed or accessed electronically and can, therefore, be completed in a location of your choosing. Participation is entirely voluntary and you can refuse to answer any question and/or quit at any time. Should you choose to quit, no one will be upset with you and your information will be destroyed right away. If you decide to quit, nothing will change about my personal and professional respect for you as a professional in this field.

The information you give will be analyzed and studied in a manner that protects your identity. That means that a code number will be used and that your real name will not appear on any of the study materials. All information you provide will remain confidential and locked in a file cabinet in the researcher's office for a minimum of five years before being destroyed.

There may be a risk that filling out a questionnaire may make you feel tired. Remember, you can stop completing the questionnaire at any time you feel tired or for any other reason.

The benefit to participating will be in knowing that you helped school librarians and school administrators learn how to better help people with developing information literacy programs that will benefit student learning

If you have any questions about this research, please contact Candace Aiani at (+886-2) 2873-9900 or at aianic@tas.edu.tw. You may also contact Candace's Faculty Advisor, Dr. Fred Galloway, at the University of San Diego (619) 260-7435 or at <Galloway@sandiego.edu>.

I have read and understand this form, and consent to the research it describes to me. I have received a copy of this consent form for my records.

Signature of Participant

Date

Name of Participant (**Printed**)

Signature of Principal Investigator

Date

Appendix P
Survey at the Completion of the Delphi

University of San Diego, Doctoral Research
Information Literacy Implementation Survey for Schools

Position (Check your primary position)

Administrator Curriculum Dev. Librarian Teacher

The questions for this survey are designed to be easy to answer.

This survey should take no more than 20 minutes to complete.

Section #1: School Characteristics

Mark the degree to which the following conditions or school characteristics exist in relation to information literacy in your school. You may not have enough information about each question to answer with 100 % accuracy, but please answer to the best of your ability with the information you do have.

	Not at all	→	→	→	→	→	To a great extent						
	1	2	3	4	5	6	7						
1.	Information literacy goals are identified and defined as standards, understandings, and/or outcomes.						1	2	3	4	5	6	7
2.	Policy related to information literacy education has been adopted by the school board.						1	2	3	4	5	6	7
3.	There is adequate accountability for implementing and teaching information literacy education.						1	2	3	4	5	6	7
4.	New technologies are regularly incorporated into learning experiences.						1	2	3	4	5	6	7
5.	Integration is included in unit design and lesson planning.						1	2	3	4	5	6	7
6.	Cooperative learning, peer mentoring, and/or inquiry-based methods are used to enhance student learning.						1	2	3	4	5	6	7
7.	The librarian has a high level of knowledge or experience with information literacy.						1	2	3	4	5	6	7
8.	Appropriate assessments of information literacy outcomes are included at the point of learning: within units and/or lessons.						1	2	3	4	5	6	7
9.	Assessment data is used to evaluate and improve the program.						1	2	3	4	5	6	7
10.	Appropriate assessments are used to evaluate student progress in meeting information literacy outcomes.						1	2	3	4	5	6	7
11.	Professional development includes communication of												

	innovations and best practice in information literacy education.	1	2	3	4	5	6	7
12.	The librarian is able to manage an information literacy program.	1	2	3	4	5	6	7

Continue on the next page.

	Not at all	→	→	→	→	→	To a great extent						
	1	2	3	4	5	6	7						
13.	All students have many opportunities to practice and apply information literacy outcomes.						1	2	3	4	5	6	7
14.	Information literacy is part of the curriculum across all relevant curriculum areas.						1	2	3	4	5	6	7
15.	There a generally recognized need among the administration that students need to learn or improve their information literacy skills.						1	2	3	4	5	6	7
16.	Integration of information literacy skills and knowledge is tracked in the implemented curriculum.						1	2	3	4	5	6	7
17.	The librarian maintains a focus on the impact of information literacy education on student performance.						1	2	3	4	5	6	7
18.	Time and resources are allocated for information literacy professional development.						1	2	3	4	5	6	7
19.	Information literacy is part of the implemented curriculum and articulated through all grade levels.						1	2	3	4	5	6	7
20.	Information literacy is part of the school's mission statement or philosophy.						1	2	3	4	5	6	7
21.	There a generally recognized need among the teachers that students need to learn or improve their information literacy skills.						1	2	3	4	5	6	7
22.	Information literacy policy is communicated and supported at the classroom level.						1	2	3	4	5	6	7
23.	There is a networking and supporting system for educators who are implementing information literacy programming.						1	2	3	4	5	6	7
24.	Information literacy education is included in the written curriculum.						1	2	3	4	5	6	7
25.	There an understanding among faculty that students must and will have information literacy knowledge and skills as part of their education in the school.						1	2	3	4	5	6	7
26.	The school administration is committed to information literacy education.						1	2	3	4	5	6	7

27.	Information literacy staff development opportunities are evaluated for their effectiveness and relevancy.	1	2	3	4	5	6	7
28.	Information literacy assessment tools are evaluated to ensure they measure the identified outcomes.	1	2	3	4	5	6	7
29.	The librarian cooperates and collaborates with others on information literacy program development.	1	2	3	4	5	6	7

Continue on the next page.

	Not at all	→	→	→	→	→	To a great extent						
	1	2	3	4	5	6	7						
30.	Priorities for implementation and emphasis are agreed upon by the stakeholder groups.						1	2	3	4	5	6	7
31.	Professional development includes time for collaboration and program development.						1	2	3	4	5	6	7
32.	Outcomes are communicated throughout the school and community.						1	2	3	4	5	6	7
33.	Information literacy education receives adequate funding for resources, curriculum development, and professional development.						1	2	3	4	5	6	7
34.	The librarian adapts information literacy practice to meet the needs of my particular school, culture, and institution.						1	2	3	4	5	6	7
35.	The school administration communicates a need for students to have information literacy skills.						1	2	3	4	5	6	7
36.	Real world problems are included in the information literacy curriculum.						1	2	3	4	5	6	7
37.	A definition of information literacy has been identified and agreed upon by all stakeholder groups.						1	2	3	4	5	6	7

Section #2: Implementer Characteristics

Implementing information literacy programming is a collaborative process among educators who have varying degrees of knowledge about information literacy. Mark the degree to which the following statements are true for you right now.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
	1	2	3	4	5
1.	I have little or no knowledge of information literacy. I have not and do not anticipate learning about or using information literacy education.				5
2.	I am acquiring information about information literacy				

	through written materials, orientation sessions, observing others and/or training sessions. I am preparing to use it or implement it for the first time.	1	2	3	4	5
3.	I have an established or stable program that runs in a fairly routine fashion. I generally write and deliver or support in some way all the information literacy lessons with which students are engaged.	1	2	3	4	5
4.	I work with or support teaching colleagues to create and deliver lessons that are integrated into or coordinated with their classroom activities and lessons.	1	2	3	4	5
5.	I am re-evaluating information literacy learning to find modifications or alternatives that will achieve greater student learning for my population.	1	2	3	4	5

Continue on the next page.

Section #3: Information Literacy Characteristics

There are many ways to engage in activities that support information literacy learning. A number are listed below. Identify those activities in which you have engaged during the past month?

1.	Updated personal competencies in information literacy through professional reading or other professional development opportunities.	Yes	No
2.	Requested, initiated, or had a meeting with a teaching colleague for the purpose of communicating, cooperating, or collaborating on information literacy instruction.	Yes	No
3.	Modeled and promoted effective uses of technology for learning and teaching.	Yes	No
4.	Looked at content curriculum goals to find a connection with information literacy.	Yes	No
5.	Learned a new technology or new aspect of an existing technology.	Yes	No
6.	Advocated informally for information literacy education with a colleague or group of colleagues.	Yes	No
7.	Collaborated with a teaching colleague to plan, deliver, or assess an information literacy lesson.	Yes	No
8.	Advocated formally for information literacy education in a curriculum planning session or meeting or professional organization.	Yes	No
9.	Guided students and teachers in the use of new media and technologies.	Yes	No

Section #4: Demographics

When looking at implementation it is important to consider the demographics that are shared among groups of schools. Again, you may not know all of these answers with 100% accuracy, but please answer them based on the information that you have.

- How would you describe your school?
 - United States Public (Including Magnet or Charter School)
 - United States Private or Independent
 - International
 - Other _____
- How many students attend your school?
 - Fewer than 200
 - 200-500
 - 500-1,000
 - More than 1,000
- Which grade level range most closely describes the students served by your school?
 - Elementary
 - Middle/Junior High School
 - High School
 - Other, please specify _____

Continue on the next page.

- What percentage of students is proficient in the language of instruction in your school?
 - 75 — 100%
 - 50 — 74%
 - 25 — 49%
 - 0 — 24%
- Are there an adequate number of computers available for students to use in your school?
 - Almost always
 - Sometimes
 - Rarely
 - Never
- How many Full-Time Equivalent (FTE) librarians and staff do you have in your school?
 - No FTE Librarians and Staff
 - Less than 1 FTE Librarian and Staff
 - 1-2 FTE Librarian and Staff
 - More than 2 FTE Librarian and Staff

Thank you for taking the time to complete this survey.

Appendix Q

Survey at the Completion of the Pilot

Information Literacy Implementation Survey (ILIS) for Schools

Thank you in advance for agreeing to complete the Information Literacy Implementation Survey (ILIS).

The questions for this survey are designed to be easy to answer.

This survey should take no more than 20 minutes to complete.

Consent Form

To participate in this study, you must mark "yes" to indicate that you have read, understand, and agree with the *Research Participant Consent Form*. After reading the form, scroll to the bottom of the page to find the response buttons

Research Participant Consent Form: Survey Participants

Candace Aiani is a doctoral student in Educational Leadership at the School of Leadership and Educational Sciences at the University of San Diego. You are invited to participate in a research project she is conducting for the purpose of exploring the creation of an instrument to measure program implementation in the area of school information literacy program development.

The project will involve filling out a survey related to information literacy program implementation. The survey will take no more than 20 minutes to complete, and also may include some questions about you, such as your area of professional expertise. The survey will be distributed or accessed electronically and can, therefore, be completed in a location of your choosing. Participation is entirely voluntary and you can refuse to answer any question and/or quit at any time. Should you choose to quit, no one will be upset with you and your information will be destroyed right away. If you decide to quit, nothing will change about my personal and professional respect for you as a professional in this field.

The information you give will be analyzed and studied in a manner that protects your identity. That means that a code number will be used and that your real name will not appear on any of the study materials. All information you provide will remain confidential and locked in a file cabinet in the researcher's office for a minimum of five years before being destroyed.

There may be a risk that filling out a questionnaire may make you feel tired. Remember, you can stop completing the questionnaire at any time you feel tired or for any other reason.

The benefit to participating will be in knowing that you helped school librarians and school administrators learn how to better help people with developing information literacy programs that will benefit student learning

If you have any questions about this research, please contact Candace Aiani at (+886-2) 2873-9900 or at aianic@tas.edu.tw. You may also contact Candace's Faculty Advisor, Dr. Fred Galloway, at the University of San Diego (619) 260-7435 or at <Galloway@sandiego.edu>.

Yes, I have read and understand this form, and consent to the research it describes to me.

No, I do not consent. Note: If you choose this option, please do not complete the survey.

Professional Role(s)

Please identify your professional role in the division or school that you work by placing a "1" on the line next to the job descriptions listed below. If you have a secondary role, put a "2" next to that job description, and so on. If you mark "other," please describe.

_____ School or Divisional Administrator

_____ Curriculum Development Coordinator

_____ Librarian / Library Media Specialist

_____ Coordinator / District Supervisor of Libraries

_____ Teacher / Support Specialist

_____ Other _____

Information Literacy Defined

"To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (ALA, 1989)

Note: While the use of computers and technology are intimately connected with information literacy, the focus of this survey is not on the development of computer and technology skills per se except to the extent that they impact information literacy competencies. Please keep this distinction in mind when answering the questions below.

Section #1: School characteristics

Questions 1-37 ask about professional and school characteristics.

Mark the degree to which the following conditions or school characteristics exist in relation to information literacy in your school. You may not have enough information about each question to answer with 100 % accuracy, but please answer to the best of your ability with the information you do have.

	Not at all	→	→	→	→	→	To a great extent						
	1	2	3	4	5	6	7						
1	Information literacy goals are defined as standards, understandings, and/or outcomes.						1	2	3	4	5	6	7
2	Policy related to information literacy education has been adopted by the school board.						1	2	3	4	5	6	7
3	There is adequate accountability for teaching information literacy education.						1	2	3	4	5	6	7
4	New technologies are regularly incorporated into learning experiences.						1	2	3	4	5	6	7
5	Integration of information literacy skills and knowledge is included in expectations for unit design and lesson planning.						1	2	3	4	5	6	7
6	Cooperative learning, peer mentoring, and/or inquiry-based methods are used to enhance student learning.						1	2	3	4	5	6	7
7	The librarian in my division or school has a high level of competency with information literacy.						1	2	3	4	5	6	7
8	Appropriate assessments of information literacy outcomes are included within units and/or lessons.						1	2	3	4	5	6	7
9	Assessment data is used to evaluate the effectiveness of the school information literacy program.						1	2	3	4	5	6	7
10	Appropriate assessments are used to evaluate student progress in meeting information literacy outcomes.						1	2	3	4	5	6	7
11	Professional development includes communication of best practice in information literacy teaching and learning.						1	2	3	4	5	6	7
12	The librarian is empowered to manage an information literacy program.						1	2	3	4	5	6	7
13	All students have many opportunities to practice and apply information literacy skills and knowledge.						1	2	3	4	5	6	7
14	Information literacy is part of the curriculum across all relevant curriculum areas.						1	2	3	4	5	6	7
15	There is a generally recognized need among the administration that students need to learn or improve												

	their information literacy skills.	1	2	3	4	5	6	7
16	Integration of information literacy skills and knowledge is tracked in the implemented curriculum.	1	2	3	4	5	6	7
17	The librarian maintains a focus on the impact of information literacy education on student performance.	1	2	3	4	5	6	7
18	Resources are allocated for information literacy professional development.	1	2	3	4	5	6	7
19	Information literacy is part of the implemented curriculum and articulated through all grade levels.	1	2	3	4	5	6	7
20	Information literacy is part of the school's mission statement or philosophy.	1	2	3	4	5	6	7
21	Teachers generally recognize that students need to learn or improve their information literacy skills.	1	2	3	4	5	6	7
22	Information literacy policy is communicated at the classroom level.	1	2	3	4	5	6	7
23	There is a support system—peer advisor, coach, administrative liaison—in place for librarians and teachers who are implementing information literacy programming.	1	2	3	4	5	6	7
24	Information literacy standards and/or outcomes are included in the written or documented curriculum of the school.	1	2	3	4	5	6	7
25	There is an understanding among faculty that students must and will have information literacy knowledge and skills as part of their education in the school.	1	2	3	4	5	6	7
26	The school administration is committed to information literacy education.	1	2	3	4	5	6	7
27	Information literacy staff development opportunities are evaluated for their effectiveness.	1	2	3	4	5	6	7
28	Information literacy assessment tools are evaluated to ensure they measure the identified outcomes.	1	2	3	4	5	6	7
29	The librarian cooperates and collaborates with others on information literacy program development.	1	2	3	4	5	6	7
30	Priorities or emphasis for implementation of information literacy outcomes or standards are agreed upon by the educators in the school.	1	2	3	4	5	6	7
31	Professional development includes time for collaboration.	1	2	3	4	5	6	7
32	Information literacy outcomes are communicated throughout the school and community.	1	2	3	4	5	6	7
33	Information literacy program development receives adequate funding.	1	2	3	4	5	6	7

34	The librarian adapts information literacy practice to meet the needs of my particular school, culture, and institution.	1	2	3	4	5	6	7
35	The school administration communicates a need for students to have information literacy skills.	1	2	3	4	5	6	7
36	Real world (authentic) problems are included in the information literacy curriculum.	1	2	3	4	5	6	7
37	A definition of information literacy has been agreed upon by teachers, administrators, and parents.	1	2	3	4	5	6	7

Thank you. You have completed a major portion of the survey. Submit this page and move to the next section.

Section #2: Personal knowledge and experience with information literacy.

Implementing information literacy programming is a collaborative process among all educators in the division or school who have varying degrees of knowledge about and experience with information literacy. The next two questions ask you to describe your knowledge and experience with information literacy. (Questions #38-39)

38. Which statement best describes your current level of knowledge of information literacy?

- I have little or no knowledge of information literacy.
- I have some knowledge of information literacy.
- I am fairly comfortable with my knowledge of information literacy.
- I am very familiar with information literacy learning.
- I am intimately familiar with information literacy.

39. Which description below best describes your current behavior and thinking about information literacy?

- I have not and do not anticipate learning about or using information literacy programming in my school.
- I am acquiring information about information literacy through general professional exposure: written materials, orientation sessions, observing others and/or training sessions. I am preparing to support it, use it, or implement it for the first time in my school.
- I support or have an established or stable program that runs in a fairly routine fashion in my school. I support—either directly or indirectly—

most of the information literacy programming with which the students for whom I am responsible are engaged.

_____ I work with or support teachers and/or colleagues to create and deliver information literacy lessons that are integrated into or coordinated with their classroom activities and lessons.

_____ I am re-evaluating information literacy learning to find modifications or alternatives that will achieve greater student learning for my particular student population.

Section #3: Information Literacy Activities

There are many ways to engage in activities that support information literacy learning. A number are listed below. Identify those activities in which you have engaged during the past month and during the past year. Mark only one.

	I have engaged in this activity in the past...	month?	year?	Not at all / Year +
1.	Updated personal competencies in information literacy through professional reading or other professional development opportunities.	Yes (month)	Yes (year)	No
2.	Requested, initiated, or had a meeting with a teacher or teaching colleague for the purpose of communicating, cooperating, or collaborating on information literacy instruction.	Yes (month)	Yes (year)	No
3.	Modeled and promoted effective uses of technology for learning and teaching.	Yes (month)	Yes (year)	No
4.	Looked at content curriculum goals to find a connection with information literacy.	Yes (month)	Yes (year)	No
5.	Learned or support the learning of a new technology or new aspect of an existing technology.	Yes (month)	Yes (year)	No
6.	Advocated informally for information literacy education with a colleague or a group of colleagues or teachers.	Yes (month)	Yes (year)	No
7.	Collaborated with a teaching colleague or supported teaching colleagues to plan, deliver, or assess an information literacy lesson.	Yes (month)	Yes (year)	No
8.	Advocated formally for information literacy education in a curriculum planning session, department/team/divisional meeting, or professional organization.	Yes (month)	Yes (year)	No

9.	Guided, encouraged, or supported students and teachers in the use of new media and technologies.	Yes (month)	Yes (year)	No
----	--------------------------------------------------------------------------------------------------	----------------	---------------	----

Section #4: Demographics

When looking at implementation it is important to consider the demographics that are shared among groups of schools. Again, you may not know all of these answers with 100% accuracy, but please answer the questions based on the information that you do have. If you are assigned to and responsible for students or teachers in one division (in a school with multiple divisions), answer these for your division only.

1. How would you describe your school?
 - United States Public (Including Magnet or Charter School)
 - United States Private or Independent
 - International
 - Other _____

2. Which grade level range most closely describes the students served by the division/school to which you belong?
 - Elementary
 - Middle/Junior High School
 - High School
 - Other, please specify _____

3. How many students attend your division/school?
 - Fewer than 200
 - 200-499
 - 500-1,000
 - More than 1,000

4. What percentage of students is proficient in the language of instruction in your division/school?
 - 75 — 100%
 - 50 — 74%
 - 25 — 49%
 - 0 — 24%

5. Are there an adequate number of computers available for students to use in the division/school to which you belong?
 - Almost always
 - Sometimes
 - Rarely
 - Never

6. How many full-time equivalent (FTE) librarians do you have in your division/school?
 - No FTE Librarians
 - Less than 1 FTE Librarian
 - 1 FTE Librarian
 - More than 1 FTE Librarian

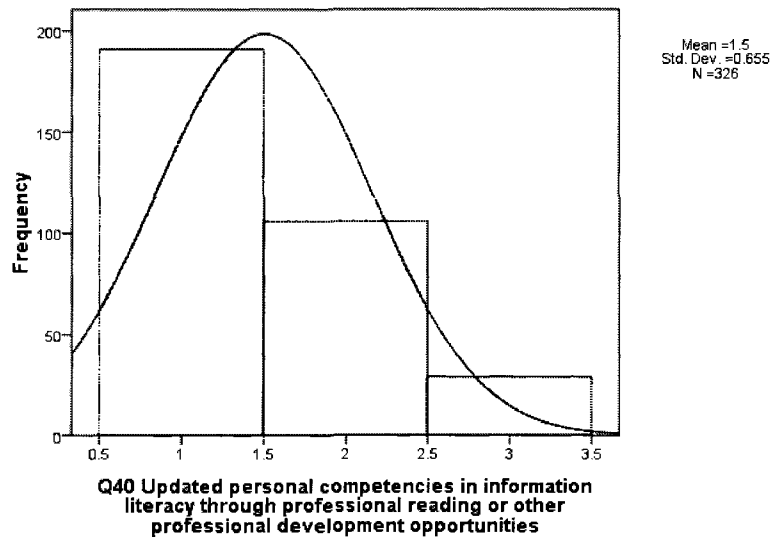
7. How many full-time equivalent (FTE) support staff do you have in your division/school library?
 - No support staff
 - Less than 1 FTE support staff
 - 1 FTE support staff
 - More than 1 FTE support staff

Thank you for taking the time to complete this survey.

Appendix R
Histograms for Items Q40-Q48

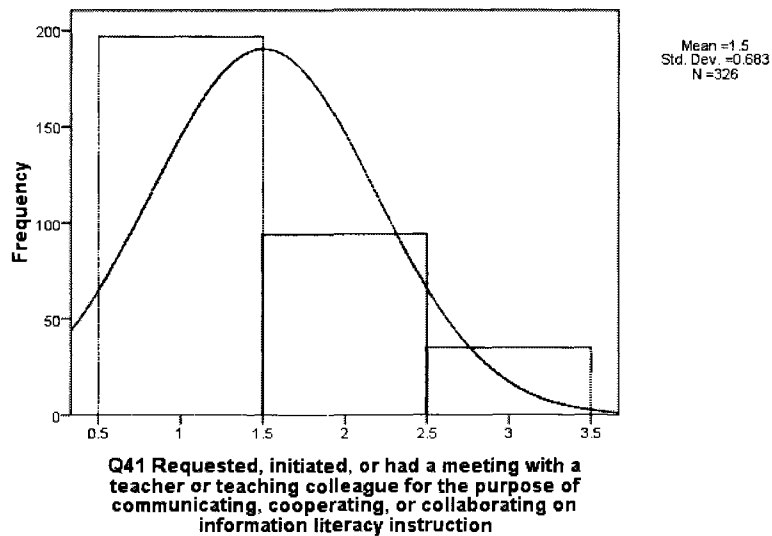
Histogram for Item Q40

Q40 Updated personal competencies in information literacy through professional reading or other professional development opportunities



Histogram for Item Q41

Q41 Requested, initiated, or had a meeting with a teacher or teaching colleague for the purpose of communicating, cooperating, or collaborating on information literacy instruction



Histogram for Item Q42

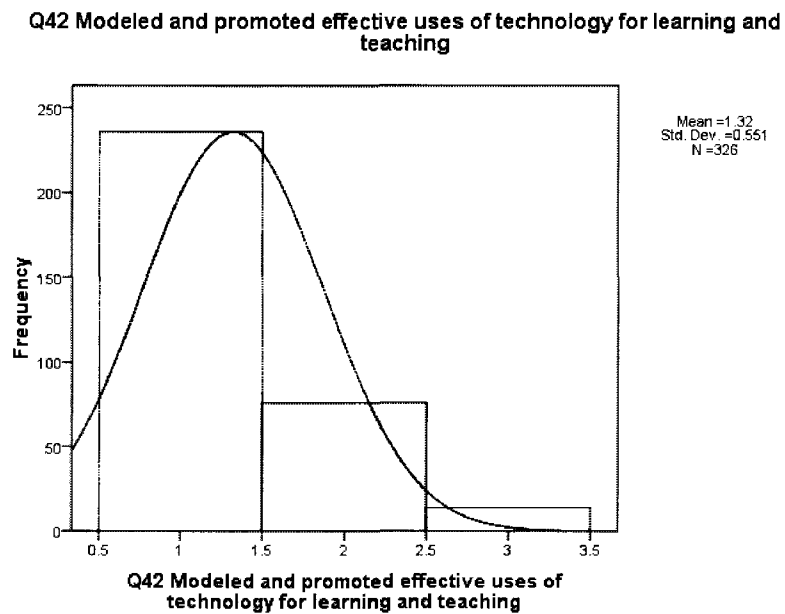


Figure 16. Histogram for Item Q43

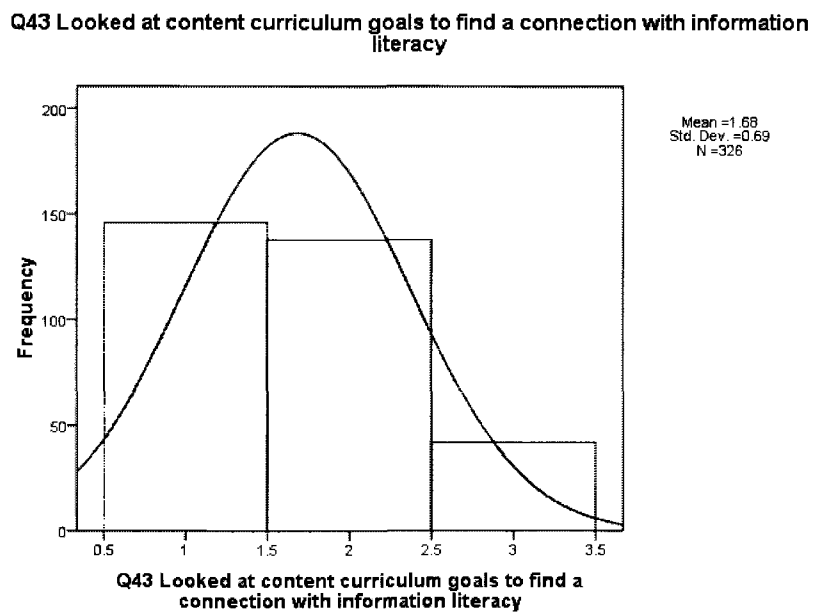
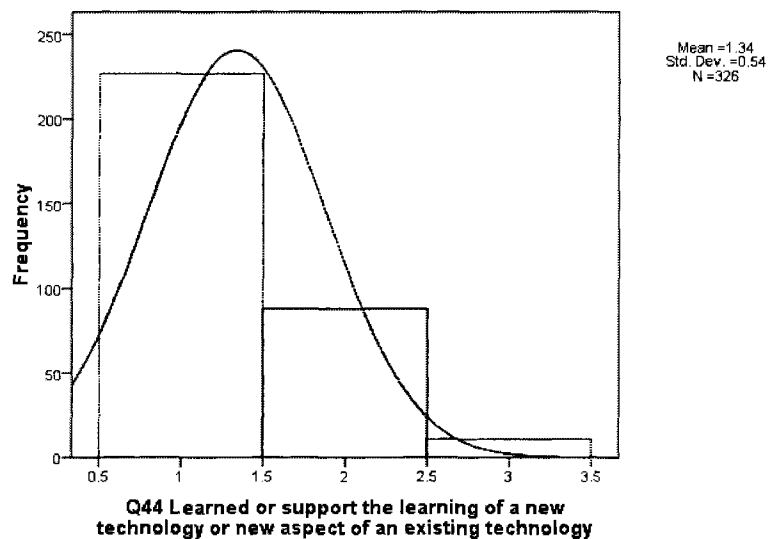


Figure 17. Histogram for Item Q44

Q44 Learned or support the learning of a new technology or new aspect of an existing technology

Figure 18. Histogram for Item Q45

Q45 Advocated informally for information literacy education with a colleague or a group of colleagues or teachers

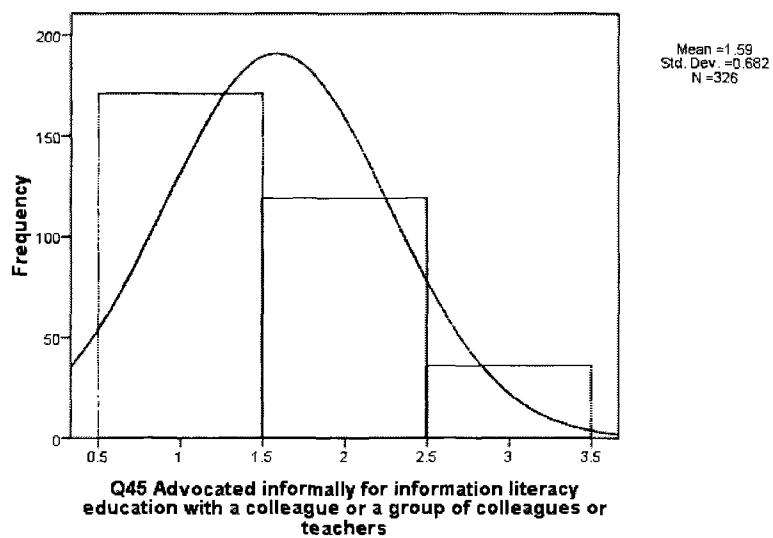


Figure 19. Histogram for Item Q46

Q46 Collaborated with a teacher or supported other professional colleagues to plan, deliver, or assess an information literacy lesson

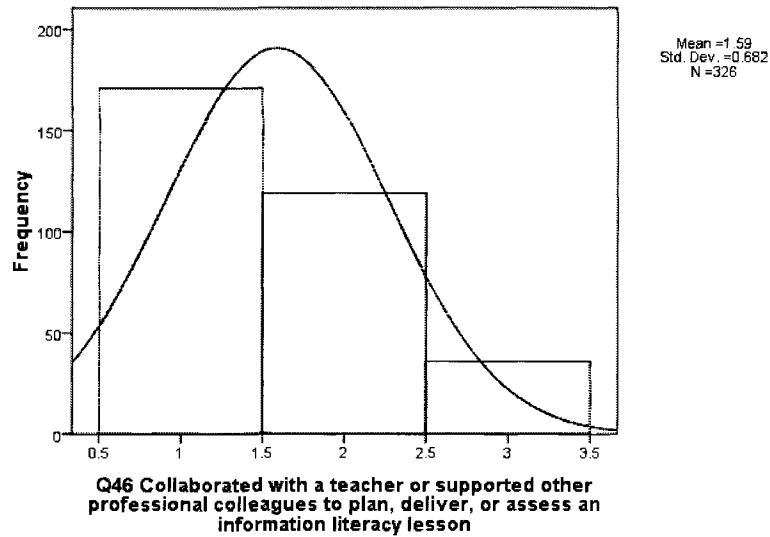


Figure 20. Histogram for Item Q47

Q47 Advocated formally for information literacy education in a curriculum planning session, department/team/divisional meeting, or professional organization

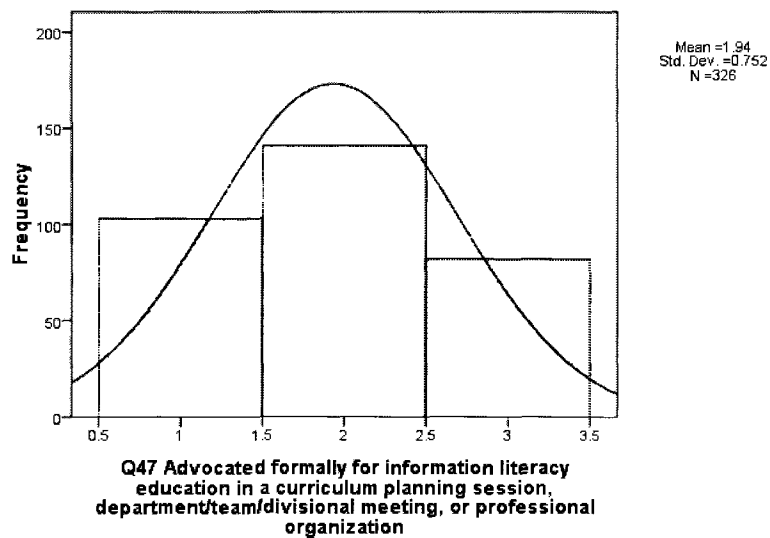
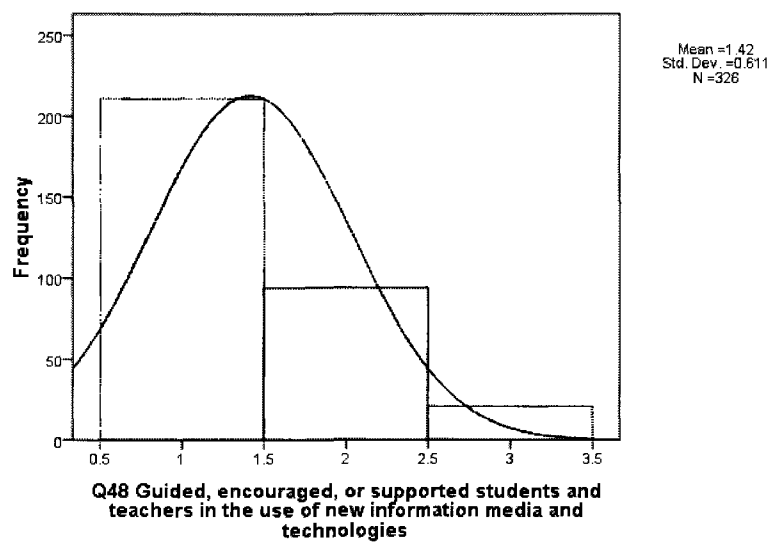


Figure 21. Histogram for Item Q48

Q48 Guided, encouraged, or supported students and teachers in the use of new information media and technologies



Appendix S

Finalized Instrument: Information Literacy Implementation Survey (ILIS)

Information Literacy Implementation Survey (ILIS)

Section I: School Characteristics

Factor One: Program Articulation & Development

- 1 Assessment data is used to evaluate the effectiveness of the school information literacy program.

- 2 Professional development includes communication of best practice in information literacy teaching and learning.

- 3 Integration of information literacy skills and knowledge is tracked in the implemented curriculum.

- 4 Resources are allocated for information literacy professional development.

- 5 There is a support system—peer advisor, coach, administrative liaison—in place for librarians and teachers who are implementing information literacy programming.

- 6 Information literacy staff development opportunities are evaluated for their effectiveness.

- 7 Information literacy assessment tools are evaluated to ensure they measure the identified outcomes.

- 8 Priorities or emphasis for implementation of information literacy outcomes or standards are agreed upon by the educators in the school.

- 9 Information literacy outcomes are communicated throughout the school and community.

- 10 Professional development includes time for collaboration.

-
- 11 A definition of information literacy has been agreed upon by teachers, administrators, and parents.
-

Factor Two: School Culture

- 12 There is a generally recognized need among the administration that students need to learn or improve their information literacy skills.
-
- 13 Information literacy is part of the school's mission statement or philosophy.
-
- 14 Teachers generally recognize that students need to learn or improve their information literacy skills.
-
- 15 Information literacy policy is communicated at the classroom level.
-
- 16 Information literacy standards and/or outcomes are included in the written or documented curriculum of the school.
-
- 17 There is an understanding among the faculty that students must and will have information literacy knowledge and skills as part of their education in the school.
-
- 18 The school administration is committed to information literacy education.
-
- 19 The school administration communicates a need for students to have information literacy skills.
-

Factor Three: Curriculum & Instruction

- 20 Information literacy goals are defined as standards, understandings, and/or outcomes.
-
- 21 There is adequate accountability for teaching information literacy education.
-
- 22 New technologies are regularly incorporated into learning experiences.
-
- 23 Integration of information literacy skills and knowledge is included in
-

expectations for unit design and lesson planning.

24 Cooperative learning, peer mentoring, and/or inquiry-based methods are used to enhance student learning.

25 Appropriate assessments of information literacy outcomes are included within units and/or lessons.

26 Appropriate assessments are used to evaluate student progress in meeting information literacy outcomes.

27 All students have many opportunities to practice and apply information literacy skills and knowledge.

28 Information literacy is part of the curriculum across all relevant curriculum areas.

29 Information literacy is part of the implemented curriculum and articulated through all grade levels.

30 Real world (authentic) problems are included in the information literacy curriculum.

Factor Four: Librarian as Key Implementer

31 The librarian is empowered to manage an information literacy program.

32 The librarian maintains a focus on the impact of information literacy education on student performance.

33 The librarian cooperates and collaborates with others on information literacy program development.

34 The librarian adapts information literacy practice to meet the needs of my particular school, culture, and institution.

Section II: Implementation Activities

- 35 Updated personal competencies in information literacy through professional reading or other professional development opportunities
-
- 36 Requested, initiated, or had a meeting with a teacher or teaching colleague for the purpose of communicating, cooperating, or collaborating on information literacy instruction.
-
- 37 Modeled and promoted effective uses of technology for learning and teaching.
-
- 38 Looked at content curriculum goals to find a connection with information literacy.
-
- 39 Learned or supported the learning of a new technology or new aspect of an existing technology.
-
- 40 Advocated informally for information literacy education with a colleague or a group of colleagues or teachers.
-
- 41 Collaborated with a teaching colleague or supported teaching colleagues to plan, deliver, or assess an information literacy lesson.
-
- 42 Advocated formally for information literacy education in a curriculum planning session, department/team/divisional meeting, or professional organization.
-
- 43 Guided, encouraged, or supported students and teachers in the use of new media and technologies.
-

Section III: Demographics

44. How would you describe your school?
-

a United States Public (Including Magnet or Charter School)

b United States Private or Independent

c International

d Other _____

45. Which grade level range most closely describes the students served by the division/school to which you belong?

a Elementary

b Middle/Junior High School

c High School

d Other, please specify _____

46. What percentage of students is proficient in the language of instruction in your division/school?

a 75 — 100%

b 50 — 74%

c 25 — 49%

d 0 — 24%

47. How many full-time equivalent (FTE) librarians do you have in your division/school?

a No FTE Librarians

b Less than 1 FTE Librarian

c 1 FTE Librarian

d More than 1 FTE Librarian

48. How many full-time equivalent (FTE) support staff do you have in your

division/school library?

a No support staff

b Less than 1 FTE support staff

c 1 FTE support staff

d More than 1 FTE support staff.

End
