The Impact of New York's School Libraries on Student Achievement and Motivation: Phase II—In-Depth Study

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This article reports the results of the second phase of a three-phase study on the impact of the New York State's school libraries' services and resources on student achievement and motivation. A representative sample of more than 1,600 classroom teachers, students, and school library media specialists (SMLSs) from 47 schools throughout New York State participated in the second phase, the in-depth survey. The survey was divided into three sections: Likert-type multiple-choice item, Likert-type rating item, and critical incident item. Results reveal that (1) all groups perceive greater emphasis on skills for finding information than on skills for using or evaluating information; (2) elementary students perceive the SLMS as more autonomy supportive than middle or high school students; (3) students are largely unaware of librarian–teacher collaboration; (4) 69 percent of students visit their school library at least once a week, and most to do research; (5) students perceive "maintaining a neat and orderly collection" and "maintaining a quiet study environment" as the two most important services provided by the LMS; and (6) there is a lack of library services to students with disabilities. Additional findings are reported.

Introduction

This research, funded by a National Leadership Grant from the Institute of Museum and Library Services, builds on the first phase of a three-phase study to investigate if and how New York State's public school library media centers (SLMCs) and school library media specialists (SLMSs) are having an impact on the learning achievement and motivation of their students. Phase I of the study consisted of a general survey that was administered to both SLMSs and to principals. Results supported previous research efforts (e.g., Lance, Wellborn, and Hamilton-Pennell 1993; Baughman 2002) by demonstrating a positive relationship between school libraries and student achievement, regardless of educational

need (e.g., school district, student poverty) and the financial resources of the school district. This research also underscored the value of New York State's K–12 LMS (teaching) certification (not required for those at the elementary level) because of the positive correlation of having this certification with student achievement. It also confirmed that certified SLMSs are more likely than uncertified library personnel to have the knowledge and skills necessary to perform effectively in New York State public school libraries.

To explore areas of interest from the general survey more deeply, phase II comprised in-depth surveys that were administered to SLMSs, classroom teachers, and students in 47 of the more than 1,600 schools that had participated in the general survey. We selected these participating schools on the basis of their representation of geographic locations throughout New York State, grade levels, and poverty level of the school community.

Previous Research

This study builds on the considerable previous research of state school library services by Lance, Wellborn, and Hamilton-Pennell (e.g., 1993), Todd & Kuhlthau (e.g., 2003), and others, stretching from Alaska to Delaware, that consistently determined a positive effect of school libraries on the students and teachers they serve. Our research extends previous work by (1) exploring the contribution of motivation to the quality of library programs and services in one of the largest and most diverse states in the country; (2) investigating the impact of library programs, services, and resources on student learning achievement; (3) identifying perceptions of administrator support; (4) describing the level of service to students with special needs; and (5) providing rich data through conducting three phases of research at different levels of breadth and depth.

Phase I consisted of a general survey administered to 1,612 (38.5 percent) of SLMSs and 832 (13 percent) of principals representing all geographic regions and socioeconomic communities in New York State (Small, Snyder, and Parker 2009). The results of this phase indicated the following:

- Elementary students in schools with certified SLMSs are more likely to have higher English and Language Arts achievement test scores than those in schools with noncertified SLMSs, regardless of resources available.
- Certified SLMSs are more likely than noncertified SLMSs to make a point of selecting materials for their library collections that represent different points of view and that support the general curriculum.
- The SLMSs' perception of the SLMC program's ability to motivate students to learn is significantly correlated with the importance the SLMSs place on teaching information literacy (IL) skills.
- After controlling for the needs/resource capacity (N/RC), elementary SLMSs use more motivation strategies in their teaching than SLMSs in either secondary or K–12 libraries.
- Principals perceive higher autonomy supportiveness (work climate) for the SLMS than SLMSs' perceptions of principals' autonomy supportiveness.

- SLMSs report lower levels of technology and physical accessibility to resources for students with disabilities than other services and resources.
- The SLMC plays an important role in many aspects of technology use in schools.

To provide greater insight into and more depth of understanding of the impact of library programs and services, phase II of this study focused on an in-depth survey administered to educators and students in a selection of 47 of the more than 1,600 schools that participated in the phase I general survey. The research question we attempted to answer from the phase II research was, "In what ways do SLMSs' actions and behaviors affect student learning and motivation?"

Research Method

The purpose of the phase II in-depth survey was to search deeper into seven areas of inquiry explored in phase I but to focus on the specific actions and behaviors of the SLMS rather than aspects of the SLMC program in general. For example, while the phase I survey asked more general, outcome-related questions about how the program motivates students (e.g., "Our school's library media program helps students gain confidence in their IL and research skills"), the in-depth survey allowed us to target inputs that would cause such outcomes, that is, asking whether specific teaching methods were used to build students' confidence (e.g., "When teaching research skills, I provide an appropriate level of challenge to students" and "When teaching research skills, I set up a supportive learning environment for students"). Another example that illustrates the difference in focus between phase I and phase II is in the area of student learning. An item from phase I stated, "Our school's library media program helps students gain the skills required to find answers to their questions" while items on the in-depth survey broke down IL skills learning into three subscales (finding, using, and evaluating information) and targeted the SLMS's role in attaining those skills (e.g., "I teach students how to ask just the right questions to get the information they need," "I teach students to use a variety of strategies to use for locating information needed to solve a problem or answer a question," and "I teach students how to evaluate the information they find").

These more specific questions related to those addressed by the phase I survey's research questions (e.g., learning, motivation and climate, technology, and services to students with disabilities) and others specified by the New York State Education Department's criteria for evaluating SLMC programs (NYSED 2004). The seven areas included (1) learning IL skills (finding, using, and evaluating information); (2) technology use; (3) respect for diversity; (4) collaboration between SLMSs and classroom teachers; (5) librarian professional development; (6) services to students with disabilities, such as individualized education programs (IEPs, written documents mandated by the Individuals with Disabilities Act [IDEA] that specifies a customized educational program designed for a student with special needs), assistive technology, and inclusion and collection development; and (7) students' perceptions of the library's learning climate (the motivational scale for this study). The in-depth survey allowed researchers to explore areas of interest in more depth and detail.

Survey Instruments

We developed three comparable survey instruments to assess perceptions of SLMSs, classroom teachers, and students. We created eleven scales to measure perceptions of the impact of SLMCs on student learning and achievement, with each group receiving a subset of those scales. In addition to demographic questions, each instrument contained three sections: (1) Likert-type, multiple-choice questions, (2) a ten-item rating question, and (3) an open-ended critical incident probe.

Pretests

We conducted a workshop with ten SLMSs participating in the Partners in Achievement: Libraries and Students (PALS) project, a regional library project, during which we provided early versions of the in-depth surveys for review and comment. SLMSs offered suggestions for revising the instruments, such as wording changes for the student version of the survey to make it more easily understood at all three grade levels.

Pilot Tests

We conducted online pilot testing with thirty-three out-of-state SLMSs, two out-of-state classroom teachers, and nine students (ranging from third to eleventh grade) from New York State schools excluded from the study because their SLMSs had participated in the pretesting. Additionally, approximately sixty students from PALS schools completed the survey on paper. Feedback from these three groups led to significant adjustments to content and to questions phrasing. We conducted exploratory factor analyses and reliability tests using the pilot data.

Final Data Collection Instruments

Eleven reliable scales, consisting of Likert-type, multiple-choice items, formed the bulk of the in-depth survey instruments (see table 1). The SLMS instrument included ten of these scales (fifty-seven items); the classroom teacher instrument included seven of those scales (forty items); and the student instrument included six of the scales (thirty-six items). All of the multiple-choice questions had the same six response choices. The following is an example of one of these items from the SLMS survey:

> I teach students how to evaluate the information they find.
>
> - Always true
> - Usually true
> - Sometimes true, sometimes not true
> - Usually not true
> - Never true
> - I don’t know

Examples of items from each of the scales for each participating group appear in figure 1. Each item has slight wording differences (e.g., “My school librarian helps me learn how . . . ” versus “I teach students how . . . ”) depending on the targeted respondent group.

We adapted the motivation scale from Deci and Ryan’s Learning Climate Questionnaire (2008), a validated instrument that assesses the perceptions of students about the degree to which a particular social context (in this case, the SLMC) is autonomy-supportive versus controlling. The questionnaire is based on Deci and Ryan’s self-determination theory (e.g., Deci and Ryan 1985), which states that a person’s motivation, performance, and well-being is influenced by the quality of his or her social context. Therefore the quality of a school library’s program and services can affect students’ learning motivation and performance as well as their general well-being. This study’s adaptation of the Learning Climate Questionnaire consisted of slight word changes (from instructor to school librarian and from past tense to present tense). For example,“My instructor encouraged me to ask questions” was changed to “My school librarian encourages me to ask questions.”

Target Population and Recruitment

A sample of forty-seven SLMSs who participated in the phase I survey volunteered to lead their school’s participation in phase II. We used purposive proportional sampling to ensure an adequate representation of the state population. School library programs were selected to correspond to the state’s demographics as much as possible, using N/RC as the distribution metric. N/RC refers to the grouping of school districts across the state according to variables identified by the state to represent resources available to the district (NYSED 2008). Factors including school district student poverty, the financial resources available to the district, enrollment, and land area are all considered when the state assigns a district to one of six N/RC categories. (A seventh category is reserved for charter schools, a group not represented in this study.)

We attempted to make the sample as representative as possible while also selecting schools with cooperative school communities in order to minimize attrition. Additionally, previous knowledge of specific school systems and recommendations from system directors were taken under advisement to build a responsive, targeted, and characteristic sample. Specifically, adjustments were made to ensure adequate representation from smaller populations and that selected schools had adequate support from their administration to fully participate in the process. Representation from urban, suburban, and rural school districts and both elementary and secondary library programs was achieved.

We contacted schools through the school principal with the SLMS acting as liaison throughout the data collection process. In addition to approval from Syracuse University’s Institutional Review Board to conduct research using human subjects, researchers were required to obtain approval for any research conducted in public schools within New York City’s five boroughs from the New York City Department of Education. Once both approvals had been received, the we invited the school principal

and SLMS in the forty-seven selected schools to participate in the study. The SLMS completed the online survey designed for librarians and recruited fourth, eighth, and eleventh grade teachers and fifth, eighth, and eleventh grade students to complete online questionnaires tailored to their role. These grade levels were targeted because of their age appropriateness and to retain the possibility of future analyses focusing on student achievement. Phase I of this study looked at fourth, eighth, and eleventh grade standardized achievement test scores in relation to student motivation to learn (Small, Snyder and Parker, 2009). Fifth (rather than fourth) grade students were recruited because the survey was administered in the beginning of the school year and incoming fourth graders would not have had IL skills instruction, critical for answering the questions. Fourth grade teachers were recruited because they worked with students during the grade of interest.

Results

A total of 47 SLMSs, 134 classroom teachers, and 1,153 students participated in this study, equaling 1,334 completed surveys. We asked them to complete the appropriate survey for their target group (SLMS, classroom teacher, or students) online using Ultimate Survey, a Web-based survey software. The completed data was analyzed using SPSS, a statistical analysis package.

Sample

Table 2 shows the sample size for each group broken down by building level (elementary, secondary, or mixed). Of the 1,153 students participants, 4 did not identify their school or grade level.

To avoid a biased sample of only SLMSs who volunteer because they feel they have exemplary programs (a so-called stacked deck of respondents), we asked the administrators from the forty-one school library systems in New York State to name those SLMSs in their systems that could be categorized as “exemplary” on the basis of the state’s School Library Program Evaluation criteria. These criteria include facility, professional staff, support staff, environment, budget, and collection (see the entire evaluation rubric at www.nyla.org/content/user_19/NYS_LibMediaEvaluationRubric.pdf). Of the 47 SLMSs who volunteered to participate in phase II of the study, 23 were identified as “exemplary.”

One SLMS from each participating school completed the in-depth survey. Of the 47 SLMS participants, 42 were female and 5 were male; the categorized their their ethnicity/race as white (41; 87 percent), African American/black (1; 2 percent), or other (5; 11 percent). When asked how many years of experience they had as an SLMS, 14 (30 percent) responded less than 5 years (one reported less than 1 year) and 14 (30 percent) had 6–10 years of experience. Eighteen (40 percent) had more than 10 years of experience (10 said they had 16 or more years). One SLMS did not respond to this question.

The 134 classroom teachers that volunteered to participate in the study comprised 30 at the elementary level and 99 at the secondary (middle and high school) level. Respondents were 106 (81 percent) female and 28 (19 percent) male. Forty-five (35 percent) of the teacher respondents were under the age of 35 while 42 (30 percent) were between 35–44 and 47 (35 percent) were over 45. Teachers identified their ethnicity/race as white (129; 88 percent), as African American/black (3; 6 percent), Hispanic/Latino/Latina (1; 1 percent), or other (1; 1 percent) as other. Respondents represented a balanced range of teaching experience; 47 (35 percent) respondents had less than five years of experience (6 were in their first year of teaching), 43(32 percent) had 6–10 years of experience, and 44 (33 percent) had more than 10 years of experience, including 20 who had more than 15 years of experience.

A total of 1,153 students voluntarily participated in the study, including 634 boys and 519 girls. Students identified their ethnicity/race as white (792; 69 percent), African-American/black (134; 12 percent), Hispanic/Latino/Latina (92; 8 percent), or other (116; 11 percent). Table 3 identifies student respondents by grade level (4 students failed to specify their grade level).

The sample represents 41 school districts from across New York State, including 9 New York City school districts. Participating schools represented 10 of the 11 regions in New York State. The 10 regions include Niagara, Finger Lakes, Thousand Islands, Adirondacks, Central Leatherstocking, Saratoga-Capital, Catskills, Hudson Valley, Long Island, and New York City (see table 4). The number of classroom teachers responding from participating schools ranged from 0 to 15; the number of student respondents ranged from 0 to 143.

When considering New York State's N/RC categorizations, the sample is highly representative. Table 5 shows proportions for the state as a whole compared to the sample.

Analysis

This study included both qualitative and quantitative data and analyses. The following section provides details of statistical results as well as outcomes of content analysis. At the conclusion of these reports, a summary of all findings from phase II of the study is provided.

Likert-Type Scales

For each of the scales containing Likert-type, multiple-choice items, we compared means across all three participant groups (including breakdowns between elementary and secondary grade levels). Table 6 shows the means and standard deviations for each scale.

We conducted comparisons across all three groups as a series of analyses of variance (ANOVAs). All main effect comparisons were significant ($p > 0.00$). Follow-up pairwise tests (Dunnett's C) revealed that for the Technology Use and Information Literacy—

Using Information measures, SLMSs scored significantly higher than classroom teachers and students, and classroom teachers scoring significantly higher than students. For the Information Literacy—Finding Information scale, there was not a significant difference between SLMS and classroom teacher scores, but both groups scored significantly higher than students. Lastly, for the Information Literacy—Evaluating Information scale, classroom teacher and student scores were not significantly different; however, SLMS scores were significantly higher. (There were no significant differences between the "exemplary" and "nonexemplary" SLMSs.) Details regarding main effect and follow-up tests are shown in table 7 and table 8.

We made additional comparisons to evaluate student scores in terms of grade level. Table 9 shows average scores for the six relevant scales across the three grade levels.

ANOVAs were conducted to compare these means. The ANOVAs helped to evaluate the relationship between grade level and average scale scores. The independent variable, grade level, had three levels: fifth, eighth, and eleventh. The dependent variable was the mean scale score for each of the six valid measures. We conducted follow-up tests (Dunnett's C) to evaluate pairwise differences between the means.

The results of the ANOVAs and follow-up tests indicated a significant ($p < 0.00$) difference between all comparisons except one: fifth and eighth grade student Technology Use scores. Elementary students consistently responded with higher scores than both middle and high school students, and middle school students scored significantly higher than high school students, indicating a more positive perception of the importance of their SLMS to a range of learning activities at the elementary and middle school levels. This may be because of the greater amount of group instruction typically conducted at those levels than at the high school level. Details of the analyses appear in table 10.

Students' mean scores on the Learning Climate scale ranged from 3.12 (eleventh-graders) to 3.90 (fifth-graders); eighth-graders' mean score was 3.49. This indicates that younger students felt their library and their SLMS were more autonomy supportive than did older students. This is not surprising as elementary schools tend to be more nurturing environments than middle and high schools because of the age of the students.

When asked how often they visit their school library, 146 students (13 percent) said "every school day," 231 (20 percent) responded "3–4 times per week," 420 (36 percent) stated "1–2 times per week," 179 (15 percent) said "1–2 times per month," 112 (10 percent) stated "1–2 times per year," and 65 (6 percent) stated that they *never* visited their school library. For students that responded that they visited their school library at least once a week, 834 (72 percent) said they did so to do research, 745 (63 percent) said they did so to use the computers, and 623 (54 percent) said they did so was to read a book or magazine.

We also ran comparisons between SLMS and classroom teacher responses. The Collaboration measure was administered to both groups, and an independent sample t-test

was conducted to evaluate differences between SLMS and teacher means for this scale. The test was significant—$t[142.9] = 2.73$, $p < 0.00$—not assuming equal variance. SLMS scores (N = 47, M = 3.95, SD = 0.63) were significantly higher than teacher scores (N = 134, M = 3.59, SD = 1.12). This suggests that SLMSs perceive that they are more actively attempting to collaborate with classroom teachers than vice versa.

The measures relating to working with students with disabilities were compared across SLMS groups (elementary and secondary). This is an important area of interest given the results of the general survey that revealed that only 34 (3 percent) SLMS respondents reported having any kind of special education training and generally reported less attention paid to adequate physical accessibility and access to assistive technologies for students with disabilities

We conducted an independent sample t-test to evaluate the difference between elementary and secondary librarians for the three scales: IEPs, Assistive Technology, and Inclusion and Collection Development. The first comparison, IEPs, was the only one with significant results—$t(42)= 4.03$, $p<0.00$—with elementary librarian scores (N = 19, M = 3.64, SD = 1.04) significantly higher than secondary librarian scores (N = 25, M = 2.32, SD = 1.11).

Additionally, these three scales relating to services to students with disabilities were evaluated against responses to the following question about the method for working with students with IEPs:

> I provide instruction to students with IEPs:
>
> - At the same time as their non-disabled peers
> - Separately from their non-disabled peers
> - Sometimes at the same time as their non-disabled peers and sometimes separately
> - I do not provide any instruction to students with IEPs
> - I do not know if my students have IEPS

It should be noted that no SLMS reported providing separate instruction to students with IEPs. The only comparison that showed a significant correlation (negative) was the relationship between the IEP scale and the method of working with students with disabilities (Pearson's correlation coefficient was -0.429, $p < 0.00$, N = 45). In other words, SLMSs that worked with students with disabilities at the same time as other students scored higher on the IEP scale, which measured the degree to which SLMSs were involved in creating and using IEPs for students with disabilities.

Furthermore, scale scores for SLMSs showed a distinct pattern of consistent positive correlations across most measures, with the exception of the three scales related to services to students with disabilities (IEPs, Assistive Technologies, and Inclusion and Collection Development) and the Respect for Diversity scale. Details of this analyses appear in table 11.

SLMS responses were further analyzed to identify relationships between the number of years spent as an SLMS and scores on both the Technology Use and Collaboration scales, relatively new emphases in the field. Our data indicate no significant correlation between the number of years spent as an SLMS and the use of technology or reported importance of collaborating with classroom teachers.

Rating Items

In addition to the multiple-choice items, the in-depth instrument included a rating question comprising ten statements that describe various services provided by SLMSs. Students, classroom teachers, and SLMSs were asked to give each item a rating, from 10 (most important) to 1 (least important), designating the importance of this task within the scope of SLMS responsibilities. We changed the wording slightly for each audience (e.g., for students, number 7 stated "keeping books in order"), but the substance of each description was consistent across all groups. Mean scores were all above the mid-point (5.0) score. The means and standard deviations for each item for the three response groups are shown in table 12.

For each respondent group, we ordered rating scores by rank based on the means shown above, revealing the order of importance of each item for each audience. These are the ranked responses (as opposed to the raw *rated* responses). Table 13 reveals ranked importance for each service across all three groups (including elementary and secondary levels), with 10 indicating the most important and 1 designating the least important service (each group's most and least important items are bolded). Five items (1, 3, 4, 5, and 9) were rated at 9.0 or above by SLMSs; no items were rated at 9.0 or above by either classroom teachers or students. Four items (4, 5, 7, and 9) were rated above 8.0 by classroom teachers while only item 7 was rated above 8.0 by students overall (although elementary students also rated item 2 above 8.0).

Item 9 (providing information resources for teachers and students), one of the more traditional roles of the SLMS, ranks as most important and item 8 (motivating teachers to use computers) ranks as least important. Interestingly, item 8 was ranked lowest by both teachers and students (but ranked somewhat higher, although still low, by SLMSs). Both SLMSs and classroom teachers ranked item 5 (motivating students to read), also a traditional SLMS role, highly. It is interesting to note that their two lowest ranked items (8 and 10) both related to supporting teachers' use of technology. Students ranked items 7 and 2 highest, both of which related to the library environment.

SLMSs rated item 9 (providing information resources for teachers and students) as their most important service (secondary students and teachers also ranked this highly). Interestingly, item 2 (maintaining a quiet study environment for students) was rated by SLMSs as least important but rated highly by both elementary and secondary students.

Classroom teachers perceived item 5 (motivating students to read) as the most important SLMS role (this also was highly rated by SLMSs and elementary students but rated low by secondary students). This is consistent with the fact that the SLMS plays less of a role

in reading guidance and literature appreciation in the higher grades than at the elementary level.

Teachers rated item 8 (motivating teachers to use computers) as least important, as did students (both elementary and secondary). Surprisingly, students consistently ranked item 7 (maintaining a neat and orderly collection of resources) as most important, while teachers also rated that service highly and SLMSs rated it at about the mid-point.

For three services listed, the difference in ratings across the groups was not statistically significant. Students, teachers, and SLMSs all rated the importance of the following services similarly:

- Item 6: Writing and enforcing policies on copyright and appropriate Internet use.
- Item 7: Maintaining a neat and orderly collection of resources.
- Item 8: Motivating teachers to use computers.

Ratings for item 6 reflected a similarly moderate rating and ranking of importance across all three groups, while item 8 reflects a uniformly high rating and ranking of importance. However, as seen from the ranking of items above, although students, teachers, and SLMSs gave item 7 a similar rating (8.38, 8.39, and 7.98 respectively), the ranking of this item is not consistent across groups. In comparison to the ratings given to other services, item 7 was the most important service according to students but only moderately important according to SLMSs.

To identify differences across groups, we also compared the average rating scores for each item by conducting a series of independent sample t-tests (see table 14 a–j). Elementary students' ratings were significantly higher than those of secondary students for 6 of the 10 items (2, 3, 4, 5, 6, and 10).

Critical Incident Question

The final item on all three forms of the in-depth instrument used an adaption of critical incident technique to ask the respondent to reflect on a particular event or activity in the school library in which the SLMS helped or excited students about learning something new. The critical incident technique requires respondents to answer a set of questions related to an event or type of event. This item was similar to one used in the school library impact study conducted by Todd & Kuhlthau (2003) in Ohio. Todd & Kuhlthau (e.g., 2003) surveyed faculty and students to determine ways in which the library facilitated student learning. In addition to forty-eight Likert-type items, the survey included an open-ended critical incident question that asked students to describe specific incidents in which they were helped in the library.

All versions of the instruments included a critical incident short-answer question that asked the respondent to recall and describe a memorable incident in the school library. Librarians were asked to describe a time when they provided help. Classroom teachers were asked to recount a time when they observed the SLMS help their student learn

something or excite their students about learning something. Students were asked to describe a time when they received help or were really excited by the SLMS to learn something. All respondents were asked to respond to the following questions:

- When did the event happen?
- What was it that you needed or wanted to know or be able to do?
- What help did you get and from whom?
- What did you learn and what did it allow you to do?
- How did you feel about the experience?
- What else can you tell us about this event?

We asked classroom teachers to relate their response to a time when the SLMS helped them or their students. Two coders performed deductive content analyses using ATLAS.ti, a computer-based, qualitative data analysis tool. Coders based their analyses of the critical incident responses on a preestablished coding scheme. The coding scheme mapped to areas of inquiry in the survey and included the following code families: Information Literacy—Finding Information; Information Literacy—Using Information; Information Literacy—Evaluating Information; Technology Use; Respect for Diversity; Learning Climate; Collaboration; Motivation; Individualized Education Programs (IEPs); Assistive Technologies; Physical Access; and Inclusion/Collection Development. Each code family had from six to sixteen related codes, such as SLMS Active on Instructional Team: Positive (Collaboration) and SLMS Teaches Appropriate Computer Use: Negative (Technology Use). A summary of the analyses of SLMS, classroom teacher, and student responses appears below.

SLMS Responses

Using deductive analysis, we originally listed 120 codes, derived from the survey questions, in the coding scheme; however, 78 of those codes were not used during the coding and subsequently removed. Table 15 provides a list of the remaining 42 codes used throughout the analysis of SLMS responses and the number of times those codes appeared in the data.

The main discussion points for the SLMSs centered on the assistance they provided to students during the research process, including computer research skills and their collaboration with classroom teachers. Their role in conducting IL lessons was most frequently mentioned. The following quotes exemplify this:

> *I taught them how to perform various searches in the card catalog and to manipulate the card catalog to show the information needed by them. The importance of using the tables of contents, indexes, skimming, and scanning was emphasized.*
>
> *I demonstrated how to find our books, how to search the OPAC, and how to find our databases.*

Comments on IL skills also made frequent reference to teaching students skills for finding information in electronic format by searching library databases and the Internet. The following quotes illustrate this:

> *I stood next to them and made them log-on, go to Internet Explorer, click on Library Links, then Databases. When they finally got to Culture Grams, on their own, they were so excited.*
>
> *I initiated a database instruction class with the fifth grade that went with their research project in the classroom.*
>
> *I demonstrated how to access and use two databases and to use a pathfinder of resources that is on our library webpage. Students were very excited about the project after we discussed it and seemed relieved to have such easy access to resources.*
>
> *These students need to access full-text journal articles to augment their research. Some think that using search engines such as Yahoo! or Google are acceptable methods of researching. I enlighten them to the wonderful database resources we subscribe to.*

Many of the SLMSs discussed the varied and innovative techniques they used in conducting classes on various subjects. Some comments that illustrate this include the following:

> *The kindergarten just completed a unit on studying apples. We read big books, fiction and nonfiction books, and sang songs. We discussed all the things you can do with apples. The culminating activity was making an apple pie, which we did in the library.*
>
> *I discovered a short (about 5 minutes) film clip on Book Brain Jr. about the nonfiction section, so I showed it as part of a lesson. The kids were so psyched! Then I did a booktalk on nonfiction books.*
>
> *I have a research game that my intermediate students play each week. This year they are playing "Mystery American." Each week there is a new mystery person and each day of the week a new clue in discovering who the person is. I routinely have students shocked that I would help them look up the answers in books.*
>
> *It is an information problem solving game that anyone can play in the library (students, staff and parents play it!). The purpose is to get students to think critically, to read, to infer, to seek help from other sources of information, including their families or they can work with a friend on finding the answer. The game is called Super Sleuth.*

In many cases, reference was made to collaboration with classroom teachers for planning and teaching classroom activities. Collaboration seemed to be a major function of many SLMSs. The following quotes exemplify this:

> *Just recently I designed a multimedia lesson on Leonardo da Vinci for a fifth grade teacher who liked it so much she told the other teachers who then asked to have it presented to their classes.*
>
> *They didn't want to stop when our time was up, so I shared what we had been doing with their teacher, and he signed out the book and continued their creations with them.*
>
> *I worked with a class recently to locate information for a class project on bio systems. It was a rare event because the teacher actually contacted me for assistance despite my continued offerings to assist classes when possible.*
>
> *The social studies, English/language arts teachers and I worked through the entire research project with students from start to finish—and each of us assigned grades for this project based on our unique and combined objectives.*
>
> *I collaborated with an English teacher to design an Internet scavenger hunt to accompany the reading of* Where the Red Fern Grows.

In addition to teaching computer research skills, SLMS responses revealed their role in helping students use computers and related technology, mainly as a tool to help students present information gathered from their research. The following excerpts illustrate this:

> *In October, second grade students were introduced to MaxWrite (the simplified version of Microsoft Word).*
>
> *Students were supported during the research process and given the opportunity to express their final project through the creation of team Podcasts. They then recorded their scripts, selected their music, and created their works of art!*

Teacher Responses

We performed a similar analysis of classroom teacher responses using the same coding scheme, but with 63 of the original 120 codes appearing in the data. A summary of results from this content analysis appears in table 16.

In many cases, the teachers discussed the role of the SLMS in terms of teaching IL skills to students as well as their collaboration with teachers in planning lessons. The most frequently discussed activity was assisting students in obtaining information needed for a class project. The following quotes illustrate this:

My students often needed pictures for reference during art. My librarian always helped them research to find the right photographs to help them.

She is available at times when the teacher is not, and she can direct students to find translations of essays and interesting articles to read and compare their originals to . . .

She reads them stories and shows them how to use the research materials, where to find the books in the library, what to include, how to find the information and the opportunity of typing their report at the end.

Our librarian helps students "shop" for free-reading books by enthusiastically engaging their personal interests and then knowing exactly where the books were.

A highlighted theme was the willingness of the SLMS to collaborate with classroom teachers on various projects. In some cases, teachers mentioned that it would have been impossible to teach a particular lesson or accomplish a particular task without the support of the SLMS. The following quotes reflect this:

She (the librarian) is always supportive of units that I develop and has just the right materials to complement my lesson plans.

Every year the library media specialist and myself put together a project that will utilize the students knowledge of World War II. I provide the background knowledge in class and then we put together a newspaper using books, Internet resources, periodicals, etc.

She also is excellent at bringing to my attention specific resources available to me that I had not previously known. She seems to be constantly on the lookout for anything that might help me to be more successful with my students.

Our librarian, Claudine, was of immense help. In September of this year, she sat down with me and helped plan out a unit on environmental issues. Because of Claudine, my students were able to use video cameras and movie maker to make short films of how the environment around them is impacted by issues like global warming and introduced species.

With the collaboration of the librarian, myself, and paraprofessionals, these learning disabled students completed their projects with much success.

This is a project that we usually work on together for weeks at a time. (Students) can get pictures off the Internet, and she shows them the appropriate sites to visit and bookmark. If I did not have her to work with me on this I would not be able to research their topic on the Internet or with library books.

Another frequently occurring theme was the involvement of the SLMS in helping students use computers both as a research tool and as a tool in the organization and presentation of their work. The following quotes exemplify comments about helping students use computers:

> *Students needed to present electronically their research on NYS. He helped show how to use new software and Macs as well as spent lots of extra lunch and recess time helping them to get the project completed.*
>
> *The students worked on a powerpoint project and the librarian walked us through the process of research, and using the program to create an creative end-product.*
>
> *My librarian showed students how to use Microsoft Publisher as well as reliable websites.*

The following quotes are examples of comments about teaching students computer research skills:

> *The head librarian introduced E-Library to my class just last week, and they were quite enthusiastic about it.*
>
> *She taught my students how to use the computer card catalogue to find materials to complete a research paper. My students were excited about how much information was available and how easy it was to find the information with the computer.*
>
> *He led the class in using the Internet and various websites, such as Time for Kids and National Geographic, in researching Mexico.*
>
> *Our librarian has instructed my students on law-related research. She also provided help in navigating JSTOR and LexisNexis in order to do more effective research.*

Still related to IL, many teachers discussed the role of the SLMS in teaching students how to find resources in a variety of formats, including book, magazine, and electronic. The following quotes reflect this:

> *He directed the students to the sport section of the library and helped with signing out appropriate books and also did some individual computer searches for those students who were struggling to find information on their particular sport.*
>
> *She assisted me in finding materials through books already in our library and through information that I could obtain on the Internet.*
>
> *She helped supply websites, movies, and books to support the course and the students in their research of particular disasters.*

The librarian conducted classes on how to carry out the research using a variety of media, print, audiovisual, computer . . .

Student Responses

Table 17 lists the seventy-four codes that resulted from a deductive content analysis of the student responses to the critical incident item.

The top five codes focused on IL and technology use and gave an indication of how students perceived the role and function of the SLMS in guiding them through the research process. By far the most commonly discussed theme was the assistance provided by the SLMS in finding some form of information needed for a class project. The following quotes exemplify this:

I had to do a research paper last year and my librarian helped me find all the information I needed to get my report done. I thought it went well and I found new interesting books in the library.

He really helps when we have a big research paper and sets aside all the books for that topic on a separate cart just for the class.

The library only had two sources about old Lou so she helped me track down more books at the public library. She was a great help.

I went into my school library to research information for possible topics to write about. My librarian helped me by looking in encyclopedias and searching the Web.

Also related to finding information, students made common reference to the ways in which the SLMS teaches students how to find electronic resources by focusing on computer research skills. The skills discussed ranged from using an electronic library catalog to using search engines and useful websites. these comments were typical:

She then told and showed me how to use OPAC and helped me find my book.

The school librarian taught me how to use the virtual library, and it has come in handy ever since for various assignments, mostly in English.

I learned how to search the Web and also that our school site has some nice search engines.

I had to do a research project and I couldn't figure out how to use the computer and he helped me get into a search engine and find every exact thing I needed.

Frequent reference was made to the assistance provided by the SLMS when using the computers in the SLMC for completing class projects and assignments. The assistance

usually involved providing support for a range of software skills. Some quotes which exemplify this are the following:

> *We had to make a menu of food from that time and they were shaped like a brochure. She helped us find the right tools on the computer to make ours look good.*
>
> *By showing me how to use the Internet and other applications on the computer, such as Word, I have used the library quite frequently to do research projects.*
>
> *One time my school librarian really helped me was in after school when she showed all the students this typing program that helps us learn how to type and I'm a lot faster then I was when I started and I don't even have to look at the keyboard any more.*
>
> *This required the use of Microsoft Publisher, in which I was not familiar with, but Mr. Miller took me through the program and showed me how to use it properly, and I was able to successfully complete my project.*
>
> *I wanted to know how to scan a picture. . . . I got help from my librarian. She helped me with every step.*

Another discussion point was that the SLMS usually did not limit them to one source of information, but directed them to a variety of print and electronic resources. This is reflected in the following statements:

> *She helps me look for information on the Web and in the encyclopedia and in articles.*
>
> *She showed me websites, and books that could help and new tips that were really helpful.*
>
> *She gave me the best and appropriate websites and the best and appropriate books that she had and could find.*

Also related to IL, students spoke about the SLMS assisting them in selecting reading material that fit their personal interests. The following quotes exemplify this:

> *Usually when I visit the library, my librarian tells me about new books coming out that will interest me. This gets me to read and coming to the library more.*
>
> *I needed to find a just right book for me but I just couldn't decide. The help that (our librarian) had given me was that she had gone through many of books that she had thought was just right for me and when she gave me a book that she thought was just right for me I had loved it, it was the greatest book that I had read all year.*

I was interested in the Da Vinci Code *and he answered my questions about it and got it from the book shelf so I could take it out and read it.*

Summary of Findings

The main phase II findings supported by both quantitative and qualitative data analyses are the following:

- SLMSs' perceptions of their impact on teaching IL skills (using and evaluating information) are greater than the perceptions of classroom teachers.
- Classroom teachers' perceptions of the impact of SLMSs on teaching IL skills (finding and using information) are greater than the perceptions of students.
- SLMSs' perceptions of their impact on teaching IL skills (finding, using, and evaluating) and technology use are greater than the perceptions of students.
- Fifth and eighth grade students' perceptions of the impact of the SLMS and SLMC on their learning and motivation are greater than the perceptions of eleventh graders on all scales except technology use.
- A majority (797; 69 percent) of fifth, eighth, and eleventh grade students visit their school library at least once a week.
- Most students (834; 72 percent) use the library for doing research.
- SLMSs perceive greater collaboration with classroom teachers than classroom teachers perceive.
- Mean scores by SLMSs for services to students with disabilities accounted for several of the lowest scores on the survey.
- Elementary SLMSs' perceptions of their use of IEPs to provide differentiated instruction to students with disabilities were greater than perceptions of secondary SLMSs.
- No SLMSs reported providing separate instruction to students with IEPs.
- There is no relationship between years of service and either collaboration or technology use.
- All of those surveyed ranked more traditional SLMS roles highest in importance.
- Both SLMS and classroom teachers ranked technology support for teachers as lowest in importance.
- Students ranked the orderliness of the library and its collection as highest in importance.
- All respondents on the critical incident item reported situations related to the SLMS teaching students to find useful information.
- As indicated by responses to the critical incident item, all groups reported frequent use of technology and resources in multiple formats for helping students find information they needed for assignments.
- Although it was not one of the highest scoring areas on the in-depth survey, both SLMSs and classroom teachers described frequent librarian–teacher collaborations in their critical incident responses.

Discussion

This article reports the results of the phase II in-depth survey on the impact of New York State's school library programs and services on student learning achievement and motivation, a follow-up to the phase I general survey. The in-depth survey included three types of questions: Likert-type multiple-choice items, a rating question, and an open-ended critical incident item. Survey participants (SLMSs, classroom teachers, and students) came from forty-seven schools representing all regions of New York State, all levels of schools (elementary, middle, high, and K–12), community types (urban, suburban, and rural), and N/RC levels.

SLMSs, classroom teachers, and students generally perceive the SLMS as having an impact on the teaching of IL skills to students, particularly the skill of finding useful information to complete assignments or satisfy curiosity. The important skills of using (e.g., extracting and synthesizing) information and evaluating the quality of information may need greater emphasis.

It is gratifying that more than two-thirds of student respondents reported visiting their SLMC at least once a week (20 percent visit the SLMC daily). The fact that almost three-quarters of student respondents use their SLMC to do research (the most frequent use) acknowledges the important role the SLMC plays in providing resources and services that support this use.

In the phase I research, Deci's Work Climate Questionnaire (see www.psych.rochester.edu/SDT/measures/paswork.php), from the same series as the Learning Climate Questionnaire used in this study, was administered to SLMS and principals, and we found that principals perceive they give more autonomy support to their SLMS than their SLMS perceive they get. The phase II study focused on students' perceptions of the autonomy supportiveness of the SLMS. The finding that younger students rated the library's learning climate (autonomy supportiveness) higher than their high school counterparts is not surprising. Elementary students are often more frequent visitors (as individuals, small groups, and whole classes) to the SLMC than middle and high school students, and elementary schools tend to be more nurturing and supportive of their students. The critical incident question also produced a number of stories that revealed autonomy supportiveness in the SLMC (e.g., "provides choices and options," "provides opportunities for success," and "maintains supportive learning environment").

Although less evident in the quantitative data, the critical incident question revealed that both SLMSs and classroom teachers acknowledge the willingness of SLMSs to collaborate, and additional data indicate that the likelihood of SLMS to collaborate is not related to the number of years of service. Not surprisingly, students appear to be largely unaware of this collaboration. It may be important for SLMSs to more vigorously promote their collaborations with classroom teachers and make those collaborations more obvious to students. Exploring different ways to promote and publicize librarian–teacher collaborative activities would be an excellent area for future research.

One somewhat surprising outcome stemmed from responses to the ten-item rating exercise that indicated that students perceive maintaining a neat and orderly collection

and maintaining a quiet study environment as the two most important services provided by the SLMS. It is unclear whether students perceive that this is what is most important to the SLMS, that they believe these to be the most important aspects when they visit the SLMC (particularly since the majority of students use the SLMC to do research), or some other reason. This would be an interesting area to pursue in future research.

As in the phase I study, the lack of SLMS services to students with disabilities was concerning. The provision of assistive learning technologies in the SLMC received the lowest scores (1.78) from the SLMS, followed closely by the attention to IEPs (2.89). This may be because of a lack of SLMS awareness of the accessibility and instructional needs of students with disabilities when they visit the library. A review of the curriculum of the top ten preservice school library programs in American universities (U.S. News and World Report 2009) found a serious lack of training in this area. Preservice librarian preparation programs that do not incorporate adequate special education training may need to consider doing so in the future so that these library professionals are best prepared to provide appropriate services to all students.

Phase III of this research, conducted in spring and fall of 2008, included (1) focus groups with SLMSs, teachers, and students; (2) interviews with building principals in ten schools statewide; and (3) longitudinal observations of and interviews with two exemplary SLMSs, focused on their relationship to other educators in their schools (e.g., principals and classroom teachers), examples of ways in which they are actualizing the general survey's eight subscale categories and how 2008 AASL 21st-Century Standards are currently being addressed with students in school libraries. Data are currently being analyzed and will be reported in a subsequent article.

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Table 1. The Eleven Reliable Scales from the In-Depth Survey Instrument

Scale Name	Items Included	Scale description	Reliability (Alpha)		
			SLMS	Teachers	Students
Information Literacy—Finding Information	6 items: 1, 2, 4–7	Measure of the perceived importance SLMSs place on teaching students skills related to finding information from the perspective of SLMSs, students, and teachers.	0.796	0.820	0.881
Information Literacy—Using Information	8 items: 8–15	Measure of the importance SLMSs place on teaching students skills related to using information, from the perspective of SLMSs, students, and teachers.	0.858	0.899	0.909

Information Literacy—Evaluating Information	6 items: 16, 17, 19, 20, 22, 23	Measure of the importance SLMSs place on teaching students skills related to evaluating information, from the perspective of SLMSs, students, and teachers.	0.825	0.877	0.888
Technology Use	6 items: 25, 27, 28, 29, 30, 31	Measure of the importance SLMSs place on teaching skills involving the use of computer, from the perspective of SLMSs, students, and teachers.	0.849	0.862	0.866
Respect for Diversity	4 items: 32–35	Measure of the importance SLMSs place on teaching students respect for diversity, from the perspective of SLMSs, students, and teachers.	0.602	0.806	0.834
Collaboration	7 items: 37, 39–44 on SLMS & Teacher	Measure of the importance SLMSs place	0.875	0.848	N/A

	instruments	on collaborating with other teachers, from the perspective of SLMSs and teachers.			
Professional Development	3 items: 47–49 on SLMS & Teacher Instruments	Measure of the importance SLMSs place on being a leader within the school community, from the perspective of SLMSs and teachers.	0.744	0.870	N/A
Individualized Education Programs (IEPs)	4 items: 72–75 on SLMS instrument only	Measure of the degree to which SLMSs are involved in creating and using IEPs for students with disabilities, from the perspective of SLMSs.	0.880	N/A	N/A
Assistive Technology	3 items: 76–78 on sLMS instrument only	Measure of the level of responsibility SLMSs have for selecting and maintaining assistive technology for students with disabilities, from the perspective of SLMSs.	0.803	N/A	N/A

Inclusion & Collection Development	3 items: 82–84 on SLMS instrument only	Measure of the importance SLMSs place on selecting materials for their collection that address the needs of students with disabilities, from the perspective of SLMSs.	0.775	N/A	N/A
Learning Climate	6 items: 37–42 on Student instrument	Adaptation of Deci's Learning Climate Questionnaire (short form), measure of students' perception of the supportiveness of the learning climate in their school library, from students' perspective	N/A	N/A	0.896

Figure 1. The Eleven Survey Scales and Examples of Items for Each Respondent Group for Each Scale

Scale	Sample Items
Information Literacy—Finding Information	I teach students the skills needed to find information using multiple sources. (SLMS)

	The SLMS teaches my students the skills needed to find information using multiple sources. (Teacher) My SLMS helps me learn how to find the information I need to complete assignments or class projects. (Student)
Information Literacy—Using Information	I teach students how to select appropriate information for solving their problem or answering their question. (SLMS) The SLMS teaches my students how to select appropriate information for solving their problem or answering their question. (Teacher) My SLMS helps me learn how to select just the right information that I need to solve my problem or answer my question. (Student)
Information Literacy—Evaluating Information	I teach students how to evaluate the information they find. (SLMS) The SLMS teaches my students how to evaluate the information they find. (Teacher) My SLMS helps me understand whether the information I find is the best information available. (Student)
Technology Use	I teach students to know when the use of computers is appropriate. (SLMS) The SLMS teaches my students the appropriate use of computers. (Teacher) My SLMS helps me learn when it is appropriate to use computers for my assignments or projects. (Student)
Respect for Diversity	I encourage students to respect the ideas of others. (SLMS) The SLMS encourages my students to respect other people's ideas. (Teacher) My SLMS helps me learn to respect the ideas of others. (Student)
Collaboration	I collaborate with teachers in my school to identify connections across student information needs, curricular content, and learning outcomes. (SLMS) The SLMS collaborates with teachers in my school to help identify connections across student information needs, curricular content, and learning outcomes. (Teacher)
Professional Development	I regularly update my professional knowledge and skills to better serve my school community. (SLMS) The SLMS regularly updates his or her professional knowledge and skills to better serve our school community. (Teacher)
Individualized Education Programs (IEPs)	I regularly review the IEPs of the students to whom I am providing instruction. (SLMS)
Assistive Technology	I collaborate with special educators to select assistive technologies (e.g., screen readers, speech recognition systems, etc.) for students with disabilities to use in the SLMC. (SLMS)

Inclusion & Collection Development	I make a point of choosing materials for the collection that address the learning needs of students with disabilities. (SLMS)
Learning Climate	I feel that my SLMS provides me choices and options. (Student)

Table 2. Characteristics of the Sample, by Group and Building Level

	Total	Elementary	Secondary	Mixed (e.g., K–12, ES/MS)	Unspecified/ Other
SLMSs	47	19 (42.5%)	25 (22.4%)	3 (6.4%)	0 (0.0%)
Teachers	134	30 (22.4%)	99 (73.9%)	5 (3.7%)	0 (0.0%)
Students	1153	489 (42.4%)	660 (57.2%)	0 (0.0%)	4 (0.4%)

Table 3. Student Sample by Grade Level

5th grade	489 (42%)
8th grade	264 (23%)
11th grade	396 (34%)
Unspecified	4 (1%)
Total	1,153 (100%)

Table 4. Participating Schools by New York State Region

Region	Schools
Chautauqua-	0

Allegheny	
Niagara	3
Finger Lakes	13
Thousand Islands	4
Adirondacks	2
Central Leatherstocking	4
Saratoga-Capital	2
Catskills	1
Hudson Valley	4
Long Island	2
New York City	12

Table 5. Characteristics of Schools in Sample, by N/RC*

N/RC	Schools in New York State*	Schools in Sample
1—High/New York City (5 boroughs)	1,225 (28.6%)	9 (19.6%)
2—High/Other Large Cities (Buffalo, Rochester, Syracuse, Yonkers)	206 (4.8%)	3 (6.5%)
3—High/Other Urban & Suburban	357 (8.3%)	3 (6.5%)
4—High/Rural	414 (9.7%)	6 (13.0%)
5—Average	1,447 (33.8%)	20 (41.3%)
6—Low	628 (14.7%)	6 (13.0%)

* Source: www.emsc.nysed.gov/repcrd2004/information/similar-schools/guide.shtml

Table 6. Score Means and Standard Deviations (SD) Presented by Groups (1 = low; 5 = high)

		SLMSs			Teachers			Students		
		All	**Elem.**	**Sec.**	**All**	**Elem.**	**Sec.**	**All**	**Elem.**	**Sec.**
N		**47**	**19**	**25**	**134**	**30**	**99**	**1,151**	**488**	**660**
Information Literacy—Finding Information	Mean	4.33	4.35	4.37	4.40	4.40	4.40	3.95	4.20	3.76
	SD	0.44	0.50	0.39	0.73	0.65	0.77	1.06	0.76	1.20
Information Literacy—Using Information	Mean	3.96	4.16	3.86	3.62	3.63	3.61	3.09	3.46	2.81
	SD	0.58	0.67	0.45	1.20	1.34	1.17	1.28	1.09	1.35
Information Literacy—Evaluating Information	Mean	4.00	3.99	4.01	3.42	3.36	3.42	3.29	3.71	2.98
	SD	0.56	0.75	0.41	1.38	1.50	1.33	1.31	1.03	1.40
Technology Use	Mean	4.28	4.15	4.39	3.95	3.54	4.05	3.18	3.31	3.08
	SD	0.69	0.92	0.49	1.12	1.39	1.02	1.30	1.10	1.43
Respect for Diversity	Mean	4.57	4.45	4.66	4.16	4.38	4.05	3.61	3.91	3.38
	SD	0.59	0.71	0.51	1.23	0.90	1.32	1.34	1.07	1.46
Collaboration	Mean	3.95	3.95	3.97	3.59	3.56	3.60			
	SD	0.63	0.73	0.59	1.12	1.18	1.14			
Professional Development	Mean	4.35	4.31	4.41	4.18	3.92	4.23			
	SD	0.45	0.54	0.39	1.23	1.47	1.16			
Individualized Education Program (IEPs)	Mean	2.89	3.64	2.32						
	SD	1.26	1.04	1.11						
Assistive Technology	Mean	1.78	1.84	1.73						
	SD	1.12	1.15	1.12						
Inclusion & Collection Development	Mean	3.87	3.95	3.81						
	SD	0.86	0.89	0.85						
Learning Climate	Mean							3.54	3.90	3.27
	SD							1.33	1.01	1.47

Table 7. Results of ANOVAs Comparing Scale Means across Three Groups on the Information Literacy, Technology Use, and Respect for Diversity Scales

Scale name	Main effect results	95% confidence intervals for pairwise differences		
Information Literacy—Finding Information	F(2, 1333) = 14.44, p < 0.00, partial h2 = 0.02		**Teachers** Mean = 4.43	**Students** Mean = 3.95
		SLMSs Mean = 4.33	N.S.	.2112 to .5562
		Teachers Mean = 4.43	–	.2885 to .6233
Information Literacy—Using Information	F(2, 1334) = 20.53, p < 0.00, partial h2 = 0.03		**Teachers** Mean = 3.62	**Students** Mean = 3.09
		SLMSs Mean = 3.96	.0175 to .6583	.6522 to 1.0988
		Teachers Mean = 3.62	–	.2758 to .7995
Information Literacy—Evaluating Information	F(2, 1332)= 7.23, p < 0.00, partial h2 = 0.01		**Teachers** Mean = 4.00	**Students** Mean = 3.29
		SLMSs Mean= 4.00	.2386 to .9276	.4969 to .9322
		Teachers Mean = 3.42	–	N.S.
Technology Use	F(2, 1334) = 36.73, p < 0.00, partial h2 = 0.05		**Teachers** Mean = 3.95	**Students** Mean = 3.18
		SLMSs Mean = 4.28	.0035 to .6713	.8455 to 1.3643
		Teachers Mean= 3.95	–	.5217 to 1.0132
Respect for Diversity	F(2, 1332) = 21.83, p < 0.00, partial h2 = 0.03		**Teachers** Mean = 4.16	**Students** Mean = 3.61
		SLMSs Mean = 4.57	N.S.	.7431 to 1.1990

		Teachers Mean = 4.16	–	.2887 to .8254

Table 8. Results of ANOVAs Comparing Scale Means across SLMS and Classroom Teacher Groups on the Collaboration and Professional Development Scales

Scale name	**Main effect results**	**95% confidence intervals for differences**	
Collaboration	F(1, 181) = 4.64, p < 0.05, partial h2 = 0.02		**Teachers** Mean = 4.18
		SLMSs Mean = 3.95	0.024 to 0.706
Professional Development	F(1, 181) = 0.851, N.S., partial h2 = 0.005		**Teachers** Mean = 3.59
		SLMSs Mean = 4.35	N.S.

Table 9. Means and Standard Deviations (SD) for Student Scores on Scales across Grade Levels (1 = low; 5 = high)

	Mean	**SD**	**N**
Info Lit Finding			
5th	4.20	0.77	488
8th	3.94	0.98	264
11th	3.64	1.31	396
Info Lit Using			
5th	3.46	1.08	488

8th	3.04	1.24	264
11th	2.66	1.40	396
Info Lit Evaluating			
5th	3.71	1.03	488
8th	3.33	1.24	264
11th	2.75	1.46	396
Technology Use			
5th	3.31	1.10	488
8th	3.25	1.29	264
11th	2.97	1.50	396
Respect for Diversity			
5th	3.91	1.07	488
8th	3.63	1.25	264
11th	3.21	1.57	396
Learning Climate			
5th	3.90	1.01	488
8th	3.49	1.30	264
11th	3.12	1.56	396

Table 10. Results of ANOVAs Comparing Student Scores across Grade Levels

Scale name	**Main effect results**	**95% confidence intervals for pairwise differences**		
Information Literacy—Finding Information	F(2, 1145) = 33.10, p < 0.00, partial h2 = 0.06		**8th** Mean = 3.94	**11th** Mean = 3.64
		5th Mean = 4.20	.0956 to .4151	.3877 to .7362
		8th Mean = 3.94	–	.0989 to .5143
Information Literacy—Using Information	F(2, 1146) = 47.8, p < 0.00, partial h2 = 0.08		**8th** Mean = 3.04	**11th** Mean = 2.66
		5th Mean = 3.46	.2051 to .6290	.6100 to 1.0112

		8th Mean = 3.04	–	.1498 to .6373
Information Literacy—Evaluating Information	F(2, 1144) = 68.78, p < 0.00, partial h2 = 0.11		**8th** Mean = 3.33	**11th** Mean = 2.75
		5th Mean = 3.71	.1655 to .5839	.7723 to 1.1792
		8th Mean = 3.33	–	.3523 to .8497
Technology Use	F(2, 1146) = 8.73, p < 0.00, partial h2 = 0.02		**8th** Mean = 3.25	**11th** Mean = 2.97
		5th Mean= 3.31	N.S.	.1378 to .5630
		8th Mean= 3.25	–	.0412 to .5563
Respect for Diversity	F(2, 1145) = 33.68, p<0.00, partial h2 = 0.06		**8th** Mean = 3.63	**11th** Mean = 3.21
		5th Mean = 3.91	.0613 to .4845	.4995 to .9331
		8th Mean = 3.63	–	.1847 to .7021
Learning Climate	F(2, 1145) = 42.02, p < 0.00, partial h2 = 0.07		**8th** Mean = 3.49	**11th** Mean = 3.12
		5th Mean = 3.90	.1866 to .6193	.5826 to 1.0083
		8th Mean = 3.49	–	.1290 to .6559

Table 11. Scale Correlations for SLMS Responses to Ten Survey Scales

		InfoLit finding	**InfoLit using**	**InfoLit eval**	**Tech**	**Diversity**	**Collab**	**Prof dev**	**IEP**	**Assistive tech**
Information Literacy—Using	Pearson Correlation	.680**								

	Sig. (2-tailed)	.000								
	N	47								
Information Literacy—Evaluating	Pearson Correlation	.735**	.712**							
	Sig. (2-tailed)	.000	.000							
	N	47	47							
Technology Use	Pearson Correlation	.477**	.383**	.564**						
	Sig. (2-tailed)	.001	.008	.000						
	N	47	47	47						
Respect for Diversity	Pearson Correlation	.292*	.200	.439**	.586**					
	Sig. (2-tailed)	.047	.179	.002	.000					
	N	47	47	47	47					
Collaboration	Pearson Correlation	.609**	.727**	.670**	.499**	.291*				
	Sig. (2-tailed)	.000	.000	.000	.000	.047				
	N	47	47	47	47	47				
Professional Development	Pearson Correlation	.651**	.591**	.764**	.646**	.456**	.622**			
	Sig. (2-tailed)	.000	.000	.000	.000	.001	.000			
	N	47	47	47	47	47	47			
Individualized Education Program (IEPs)	Pearson Correlation	-.077	.020	.043	-.214	-.106	-.053	-.055		
	Sig. (2-tailed)	.609	.893	.774	.149	.479	.723	.714		
	N	47	47	47	47	47	47	47		
Assistive	Pearson	.089	.109	.160	.098	.081	.202	.079	.26	

Technology	Correlation								2	
	Sig. (2-tailed)	.551	.465	.283	.512	.590	.174	.597	.075	
	N	47	47	47	47	47	47	47	47	
Inclusion & Collection Development	Pearson Correlation	.429**	.407**	.478**	.233	.188	.308*	.409**	-.034	.136
	Sig. (2-tailed)	.003	.005	.001	.115	.206	.035	.004	.823	.362
	N	47	47	47	47	47	47	47	47	47

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Table 12. Means and Standard Deviations (SD) for Rated Items (1 = most important; 10 = least important)

	SLMS (N = 47)		**Teachers (N = 134)**		**Students (N = 1,147)**		**Student Elem. (N = 488)**		**Student Sec. (N = 659)**	
Rated Item	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
1. Working with teachers to teach research skills to students	9.23	1.05	7.55	2.59	6.32	3.00	6.33	3.16	6.31	3.88
2. Maintaining a quiet study environment for students	5.53	2.48	7.63	2.17	7.88	2.61	8.10	2.61	7.72	2.61
3. Helping students use computers responsibly	9.00	1.22	7.70	2.64	6.64	3.02	6.89	3.00	6.44	3.02
4. Promoting school library resources and activities within the school	9.09	1.23	8.22	1.87	7.16	2.72	7.40	2.70	6.97	2.75
5. Motivating students	9.64	0.64	8.83	1.83	6.67	3.26	7.75	2.86	5.87	3.32

to read										
6. Writing and enforcing policies on copyright and appropriate Internet use	7.62	2.21	7.52	2.75	7.03	3.07	7.41	3.09	6.75	3.03
7. Maintaining a neat and orderly collection of resources	7.98	1.85	8.39	1.73	8.38	2.42	8.62	2.30	8.21	2.50
8. Motivating teachers to use computers	6.30	3.00	5.90	3.16	5.43	3.37	5.10	3.46	5.66	3.28
9. Providing information resources for teachers and students	9.67	0.94	8.60	1.73	7.16	2.76	7.31	2.73	7.05	2.78
10. Providing computer support to teachers	5.87	3.45	6.52	3.34	5.58	3.35	5.26	3.413	5.81	3.28

Table 13. Item Rankings across Three Response Groups (Highest and Lowest Scores Bolded)

Rated Item	Overall	SLMS	Teacher	Student	Elem.	Sec.
1. Working with teachers to teach research skills to students	5	8	4	3	3	4
2. Maintaining a quiet study environment for students	3	**1**	5	9	9	9
3. Helping students use computers responsibly	6	6	6	4	4	5
4. Promoting school library resources and activities within the school	7	7	7	7	6	7
5. Motivating students to read	9	9	**10**	5	8	3
6. Writing and enforcing policies on copyright and appropriate Internet use	4	4	3	6	7	6
7. Maintaining a neat and	8	5	8	**10**	**10**	**10**

orderly collection of resources						
8. Motivating teachers to use computers	**1**	3	**1**	**1**	**1**	**1**
9. Providing information resources for teachers and students	**10**	**10**	9	8	5	8
10. Providing computer support to teachers	2	2	2	2	2	2

Table 14 a | b | c | d | e | f | g | h | i | j

Table 14a. Item 1: Working with Teachers to Teach Research Skills to Students

		N	Mean	Std. Deviation
SLMS		47	9.23	1.05
Teacher		134	7.54	2.589
Elem.		488	6.33	3.156
Sec.		659	6.31	2.88
		t	**df**	**Sig. (2-tailed)**
SLMS	**Elem.**	13.877†	150.815	.000
	Sec.	15.425†	106.659	.000
	Teacher	6.238†	175.570	.000
Elem.	**Sec.**	.107†	992.347	.915

† Equal variances not assumed

Table 14b. Item 2: Maintaining a Quiet Study Environment for Students

	N	Mean	Std. Deviation

SLMS	47	5.53	2.48
Teacher	134	7.63	2.171
Elem.	488	8.10	2.605
Sec.	659	7.72	2.61

		t	**df**	**Sig. (2-tailed)**
SLMS	**Elem.**	-6.484	533	.000
	Sec.	-5.561	704	.000
	Teacher	-5.504	179	.000
Elem	**Sec.**	2.445	1145	.015

† Equal variances not assumed

Table 14c. Item 3: Helping Students Use Computers Responsibly

	N	**Mean**	**Std. Deviation**
SLMS	47	9.00	1.22
Teacher	134	7.70	2.644
Elem.	488	6.89	3.001
Sec.	659	6.44	3.02

		t	**df**	**Sig. (2-tailed)**
SLMS	**Elem.**	9.457†	112.186	.000
	Sec.	12.011†	94.019	.000
	Teacher	4.490†	166.628	.000
Elem.	**Sec.**	2.462	1145	.014

† Equal variances not assumed

Table 14d. Item 4: Promoting School Library Resources and Activities within the School

	N	**Mean**	**Std. Deviation**
SLMS	47	9.09	1.231

Teacher		134	8.22	1.869
Elem.		488	7.40	2.698
S		659	6.97	2.753
		t	**df**	**Sig. (2-tailed)**
SLMS	**Elem.**	7.744†	96.505	.000
	Sec.	10.095†	83.966	.000
	Teacher	3.598†	122.773	.000
Elem.	**Sec.**	2.634	1145	.009

† Equal variances not assumed

Table 14e. Item 5: Motivating Students to Read

		N	**Mean**	**Std. Deviation**
SLMS		47	9.64	.640
Teacher		134	8.83	1.833
Elem.		488	7.75	2.859
Sec.		659	5.87	3.317
		t	**df**	**Sig. (2-tailed)**
SLMS	**Elem.**	11.858†	291.027	.000
	Sec.	23.661†	311.030	.000
	Teacher	4.405†	178.999	.000
Elem.	**Sec.**	10.277†	1,118.895	.000

† Equal variances not assumed

Table 14f. Item 6: Writing and Enforcing Policies on Copyright and Appropriate Internet Use

	N	**Mean**	**Std. Deviation**
SLMS	47	7.62	2.212
Teacher	134	7.52	2.747
Elem.	488	7.41	3.090

Sec.		659	6.75	3.034
		t	**df**	**Sig. (2-tailed)**
SLMS	**Elem.**	.595†	64.697	.554
	Sec.	2.520†	59.092	.014
	Teacher	.213	179	.832
Elem.	**Sec.**	3.596	1,145	.000

† Equal variances not assumed

Table 14g. Item 7: Maintaining a Neat and Orderly Collection of Resources

		N	Mean	Std. Deviation
SLMS		47	7.98	1.847
Teacher		134	8.39	1.734
Elem.		488	8.62	2.302
Sec.		659	8.21	2.497
		t	**df**	**Sig. (2-tailed)**
SLMS	**Elem.**	-1.843	533	.066
	Sec.	-.621	704	.535
	Teacher	-1.369	179	.173
Elem.	**Sec.**	2.858†	1,091.721	.004

† Equal variances not assumed

Table 14h. Item 8: Motivating Teachers to Use Computers

	N	Mean	Std. Deviation
SLMS	47	6.30	2.999
Teacher	134	5.90	3.164
Elem.	488	5.10	3.455
Sec.	659	5.66	3.282

		t	df	Sig. (2-tailed)
SLMS	**Elem.**	2.290	533	.022
	Sec.	1.303	704	.193
	Teacher	.746	179	.457
Elem.	**Sec.**	-2.759	1145	.006

† Equal variances not assumed

Table 14i. Item 9: Providing Information Resources for Teachers and Students

		N	Mean	Std. Deviation
SLMS		47	9.66	.939
Teacher		134	8.60	1.747
Elem.		488	7.31	2.730
Sec.		659	7.05	2.782
		t	**df**	**Sig. (2-tailed)**
SLMS	**Elem.**	12.730†	142.453	.000
	Sec.	14.958†	118.408	.000
	Teacher	5.177†	149.385	.000
Elem.	**Sec.**	1.604	1,145	.109

† Equal variances not assumed

Table 14j. Item 10: Providing Computer Support to Teachers

		N	Mean	Std. Deviation
SLMS		47	5.87	3.449
Teacher		134	6.51	3.342
Elem.		488	5.26	3.413
Sec.		659	5.81	3.279
		t	**df**	**Sig. (2-tailed)**

SLMS	**Elem.**	1.169	533	.243
	Sec.	.131	704	.896
	Teacher	-1.125	179	.262
Elem.	**Sec.**	-2.735	1,145	.006

† Equal variances not assumed

Table 15. Codes Used for Content Analysis of SLMS Responses

Finding Useful Information - Positive	23	Finding Differentiated Reading Materials - Positive	14	SLMS Helps Students Use Computers - Negative	3	Asking Right Questions - Positive	1
SLMS Teaches Computers Research Skills - Positive	14	Leadership Vision of SLMS - Positive	14	SLMS Provides Choices - Positive	3	Frequency of School Library Visits for Academic Reasons	1
SLMS Uses Varied Teaching Methods - Positive	14	SLMC as Resource - Positive	14	SLMS Provides Opportunities for Success - Positive	3	Frequency of School Library Visits for Recreational Reading	1
SLMS' Willingness to Collaborate - Positive	14	SLMS Active on Instructional Team - Positive	14	SLMS Provides Opportunities to Use Research Skills - Positive	3	Identify Information Need - Positive	1
SLMS Helps Students Use Computers - Positive	13	SLMS as Technology Role Model - Positive	13	SLMS Provides Recognition - Positive	2	SLMS Conveys Usefulness of Skills to Students - Positive	1
Finding Resources in Multiple Formats - Positive	8	Evaluate Quality of Artifact - Positive	8	SLMS Teaches Computers Research Skills - Negative	2		
Information Organization - Positive	8	Identify Innacurate Information - Positive	8	SLMS Team Teaches - Positive	2		
SLMS Collaborates for Instructional Design - Positive	8	SLMS Builds on Students' Prior Knowledge - Positive	8	SLMS Updates Knowledge/Skills - Positive	2		
Communicating Information in Appropriate Format - Positive	7	SLMS Clarifies Expectations - Positive	7	SLMS Uses IEPs to Inform Instruction - Negative	2		
		SLMS Collaborates with Teachers for	7	SLMS Uses IEPs to	2		

SLMS Provides Recognition and Presentations Choices - Positive	7	Inform Instruction - Positive	2
Evaluate Resources - Positive	5	Recognize Relevant Information - Positive	1
Find Diverse Viewpoints - Positive	5	Sharing Information - Positive	1
SLMS as Research Role Model - Positive	5		
SLMS Provides Enrichment Opportunities - Positive	5		
Creating Artifacts from Information - Positive	4		
Information for Personal Interest - Positive	4		
SLMS Challenges Students - Positive	4		
SLMS Stimulates Student Curiosity - Positive	4		

Assessment - Positive	2
SLMS Collaborates with Teachers to Map Curriculum - Positive	2
SLMS Encourages Questions - Positive	2
SLMS Has Access to IEPs - Negative	2
SLMS Maintains Supportive Learning Environment - Positive	2
SLMS Models Enthusiasm - Positive	2
SLMS Provides Choices and Options - Positive	2
SLMS Reviews IEPs Regularly - Negative	2
SLMS Seeks Feedback from Teachers - Positive	2
SLMS Shows Confidence in Student Abilities - Positive	2
Respect Copyright/Citing Sources - Positive	2
Time as SLMS	2

Table 16. Codes Used for Content Analysis of Teacher Responses

Finding Useful	67	SLMS Chooses	3	Frequency of School	1

Information - Positive		Materials that Address Learning Needs - Positive		Library Visits for Academic Reasons	
SLMS' Willingness to Collaborate - Positive	39	SLMS Collaborates with Teachers to Map Curriculum - Positive	3	Identify Innacurate Information - Positive	1
SLMS Helps Students Use Computers - Positive	29	SLMS Encourages Curiousity - Positive	3	SLMC as Resource - Negative	1
SLMS Teaches Computers Research Skills - Positive	28	SLMS Stimulates Student Curiousity - Positive	3	SLMS Challenges Students - Negative	1
Finding Resources in Multiple Formats - Positive	25	SLMS Team Teaches - Positive	3	SLMS Collaborates with Teachers for Assessment - Positive	1
Communicating Information in Appropriate Format - Positive	21	SLMS Updates Knowledge/Skills - Positive	3	SLMS Conveys Importance of Research Skills - Positive	1
Content Area Taught	14	Distinguish Fact, Opinion, P.O.V. - Positive	2	SLMS Encourages Questions - Positive	1
SLMS Collaborates for Instructional Design - Positive	14	Finding Useful Information - Negative	2	SLMS Models Enthusiasm - Negative	1
SLMS Maintains Supportive Learning Environment - Positive	14	Frequency of School Library Visits	2	SLMS Promotes Relevance of Skills - Positive	1
SLMS Uses Varied Teaching Methods - Positive	14	SLMS Active on Instructional Team - Positive	2	SLMS Provides Opportunities to Use Research Skills - Positive	1
Finding Differentiated Reading Materials - Positive	13	SLMS Builds on Students' Prior Knowledge - Positive	2	SLMS Provides Recognition and Presentations Choices - Positive	1
Creating Artifacts from Information - Positive	11	SLMS Clarifies Expectations - Positive	2	SLMS Providses Enrichment Opportunities - Positive	1
Information for Personal Interest - Positive	11	SLMS Computer Mastery - Positive	2	SLMS Shows Confidence in Student Abilities - Positive	1
Evaluate Resources - Positive	9	SLMS Provides Recognition - Positive	2	SLMS Trains	1
		SLMS Seeks	2		

Find Diverse Viewpoints - Positive	9	Feedback from Teachers - Positive		Teachers - Positive	
Information Organization - Positive	8	SLMS Teaches Appropriate Computer Use - Positive	2	Recognize Relevant Information - Positive	1
SLMS Models Enthusiasm - Positive	5	SLMS Understands Students' Opinions - Positive	2	Respect Copyright/Citing Sources - Positive	1
SLMS as Research Role Model - Positive	4	Selecting Appropriate Information - Positive	2	Respect Others' Ideas - Positive	1
SLMS Provides Choices and Options - Positive	4	Sharing Information - Positive	2	Special Educator	1
SLMS Provides Opportunities for Success - Positive	4	Time at Current School/Position	2		
SLMC as Resource - Positive	3	Alternative Information Seeking Options - Positive	1		
SLMS as Technology Role Model - Positive	3	Asking Right Questions - Positive	1		
		Finding Resources in Multiple Formats - Negative	1		

Table 17. Codes Used for Content Analysis of Student Responses

Code	Count	Code	Count	Code	Count
Finding Useful Information - Positive	795	Recognize Relevant Information - Positive	12	Completeness of Information - Negative	1
SLMS Teaches Computers Research Skills - Positive	220	SLMS as Research Role Model - Positive	11	Evaluate Quality of Artifact - Positive	1
Grade Level	203	SLMS Challenges Students - Positive	11	Find Diverse Viewpoints - Negative	1
SLMS Helps	161				

Students Use Computers - Positive		SLMS Relates Skills to Students' Needs/Interests - Positive	11	Information for Personal Interest - Negative	1
Finding Resources in Multiple Formats - Positive	142	Identify Innacurate Information - Positive	10	SLMS as Technology Role Model - Negative	1
Information for Personal Interest - Positive	105	SLMS Shows Confidence in Student Abilities - Positive	10	SLMS Challenges Students - Negative	1
Communicating Information in Appropriate Format - Positive	66	Respect Copyright/Citing Sources - Positive	10	SLMS Chooses Materials that Address Learning Needs - Negative	1
SLMS Provides Opportunities for Success - Positive	64	SLMS Teaches Computers Research Skills - Negative	7	SLMS Encourages Questions - Negative	1
SLMS Provides Choices and Options - Positive	56	Completeness of Information - Positive	6	SLMS Models Enthusiasm - Positive	1
Information Organization - Positive	51	SLMS Promotes Relevance of Skills - Positive	6	SLMS Provides Choices - Positive	1
SLMS Maintains Supportive Learning Environment - Positive	33	SLMS Provides Recognition - Positive	6	SLMS Provides Recognition and Presentations Choices - Positive	1
Frequency of School Library Visits	31	SLMS as Technology Role Model - Positive	5	SLMS Shows Confidence in Student Abilities - Negative	1
Finding Differentiated Reading Materials - Positive	29	SLMS Computer Mastery - Positive	5	SLMS Trains Teachers - Positive	1
Frequency of School Library Visits for Academic Reasons	29	SLMS Encourages Questions - Positive	5	SLMS Updates Knowledge/Skills - Negative	1
SLMC as Resource - Positive	24	Distinguish Fact, Opinion, P.O.V. - Positive	4	SLMS Updates Knowledge/Skills - Positive	1
SLMS Understands Students' Opinions - Positive	24	SLMS Clarifies Expectations - Positive	4	SLMS Uses IEPs to Inform Instruction - Negative	1
Frequency of School Library Visits for Computer Use	22	SLMS Helps Students Use Computers -	4	SLMS Uses Varied Teaching Methods - Positive	1

Frequency of School Library Visits for Recreational Reading	22
Find Diverse Viewpoints - Positive	19
Evaluate Resources - Positive	18
SLMS Teaches Appropriate Computer Use - Positive	18
SLMC as Resource - Negative	17
Creating Artifacts from Information - Positive	16
SLMS Ties Effort to Success - Positive	13
Selecting Appropriate Information - Positive	13
Finding Useful Information - Negative	12

Negative	
SLMS Maintains Supportive Learning Environment - Negative	4
Finding Resources in Multiple Formats - Negative	3
Average Grades	2
Content Area Taught	2
SLMS Builds on Students' Prior Knowledge - Positive	2
SLMS Maintains Atmosphere of Acceptance - Positive	2
SLMS Teaches Appropriate Computer Use - Negative	2
SLMS Understands Students' Opinions - Negative	2
SLMS' Willingness to Collaborate - Positive	2
Respect Others' Ideas - Positive	2
Alternative Information Seeking Options - Positive	1
Asking Right Questions - Positive	1

Respect Copyright/Citing Sources - Negative	1
Sharing Information - Positive	1