Researching Data sets to Develop State Library Standards

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Meeting:

Abstract:

California is developing school library student outcome standards and quantitative standards for library program factors that provide the conditions for students to meet library outcomes. In an effort to make those program standards empirically based, the researchers analyzed three 2008-9 reputable data sets: California's school library data set, AASL's School Libraries Count data set, and a national School Library Journal data set. Standards were clustered into two sections: baseline factors, and statistical standards for resources. Findings revealed that school libraries that met the "baseline" standard were significantly different from those libraries that did not meet those standards. Once the baseline set of factors were determined, descriptive and correlational statistics were applied to the data sets, with the resultant figures based on the average figures supplied by those libraries that met the baseline factors.

School library media programs support the school's mission, and more specifically, they have their own aligned mission: to help students and staff become effective user of idea and information (American Association of School Librarians (AASL), 1998). The 2009 AASL *Empowering Learners: Guidelines for School Library Media Programs* focuses on developing a flexible learning environment so students can become competent in 21 century learning skills.

AASL, and many states, have defined what learning skills are under the prevue of the teacher librarian – or at least what skills that teacher librarians can address in collaboration with the rest of the school community. Moreover, AASL and states have also created standards for 21st century learning: what students should know and be able to do. The AASL standards include: inquiry and critical thinking, application and creation of knowledge, ethical and productive sharing, and the pursuit of personal and esthetic growth. Each standard is composed of skills, dispositions, responsibilities, and self-assessment strategies.

For those standards to be implemented, teacher librarians are responsible for providing the optimal *conditions* for learning. Thus, not only are there standards for students, but there are standards for library media programs. These standards describe the resources and the services that the library can provide, the supports and interventions that facilitate student learning.

In March, 2009, the California legislation permitted the state Department of Education to develop library standards. The action was possible due to the close reading of the state Education Code by State School Library Consultant Barbara Jeffus and Instructional Services Coordinator Susan Martimo. They quickly recruited a steering committee to develop student learning outcome standards and school library media program (SLMP) standards.

The SLMP standards were predicated on the assumption that certain resources needed to be in place for student library standards to be addressed effectively. Many other states have SLMP standards, but the basis for their factors is not as clear. California wanted to make sure that their standards were data-based, which is now easier to derive since dozens of studies have demonstrated that staffing, collections, services, and facilities impact student learning.

Literature Review on Student Achievement and School Library Media Programs

Numerous studies since the 1950s have established that school library media programs contribute significantly to student academic success. Some practices are straight-forward, such as teaching students how to strategically find and evaluate needed information. Likewise, providing a rich collection of curriculum-supportive resources helps students comprehend academic subject matter better. It should be noted that not only do teacher librarians (TL) *directly* impact student success, but that they contribute *indirectly* by helping classroom teachers succeed in developing and delivering curriculum more effectively because of the library's resources and services such as just-in-time training in technology utilization.

Parsing the SLMP's elements, several variables have been identified as contributing to student academic achievement: staffing; the library facility itself as a physical learning environment; library collections; instruction, collaboration, reading-related and other services; and program administration. (It should be noted that compendiums of studies (e.g., Farmer, 2003; Lance, Rodney & Russell, 2007; Scholastic, 2008) are cited below when several studies have indicated a significant contribution).

The single most important variable is the value-added service of a **full-time credentialed teacher librarian.** Over twenty separate studies with a wide variety of populations attest to this vital factor, noting TL's positive impact on overall student academic achievement, reading performance, information competency and study skills (Farmer, 2003; Scholastic, 2008). Such TLs should not have non-library teaching duties, although they do need to instruct *in* the library (Houston, 2008). Farmer's 2003 literature review identified several specific characteristics of effective TL, such as technological competency, communication skills, and trustworthiness. The other significant aspect of staffing is the value-added service of a **full-time paraprofessional librarian** as a team member alongside a full-time TL (Achterman, 2008; Lance, Rodney & Russell, 2007; Scholastic, 2008).

Another obvious factor is the library **facility** itself, which needs to be **accessible throughout the day** for both classroom and individual use (Callison, 2004; Farmer, 2003;

Lance, Rodney & Hamilton-Pennelll, 2007). To facilitate access, particularly for relevant learning "moments," **flexible scheduling** is necessary (although some fixed scheduling can be offered) (Shannon, 2007).

The school community usually thinks of the school library in terms of its **collection**. However, that variable has to be parsed into several aspects in order to be meaningful. For instance, the collection should support the curriculum (Farmer, 2006; Small, 2008). The **larger** the collection, the better (Farmer, 2003) *with the proviso* that materials are **current** (Burgin & Bracy, 2003; Lance, 2001, 2005) and **diverse** (Farmer, 2006; Small, 2008).

Another necessary type of necessary resources these days is **technology**. The school media center needs to provide student access to **Internet-connected computers**, **online subscription database aggregators**, an **online library catalog,** and a **library web portal** (Farmer, 2003; Roberson, Schweinle & Applin, 2003; Lance, Rodney & Russell, 2007; Scholastic, 2008).

Several variables are clustered under the heading of services. The TL needs to **regularly instruct** the school community (Achterman, 2008; Ireland, 2001; Farmer, 2003; Lance, Rodney & Russell, 2007; Scholastic, 2008). This activity can be further divided into **audience** (Farmer, 2003; Lance, Rodney & Hamilton-Pennelll, 2007), **content matter** (Achterman, 2008; Farmer, 2003; Lance, Rodney & Russell, 2007; Scholastic, 2008), and **delivery method** (Farmer, 2003).

Linked with instruction as well as other services is **collaboration**, although this term could be further refined in terms of degrees of interaction (e.g., communication, cooperation, coordination). Nevertheless, collaboration implies interdependent planning and implementation. Because it enables resources to be used more effectively and facilitates student learning, collaboration has identified in dozens of studies as a key variable in academic achievement (Farmer, 2003; Houston, 2008; Lance, Rodney & Russell, 2007; Scholastic, 2006). Less obvious is the means to quantify such collaboration: the frequency, extent, and quality of such collaboration.

Overall service quality, although hard to quantify as such, has identified as a contributing factor to student academic success since the 1960s (McMillen, 1965; Thorne, 1967) to this decade (Achterman, 2008; Farmer, 2006).

Reading-related services is a subset of actions that constitute a significant variable in student academic success (Achterman, 2008; Farmer, 2003; Lance, Rodney & Russell, 2007; McCullouch, 2006; Scholastic, 2008). Some of the supportive services for both academic and recreational reading mentioned in studies include: materials selection, reading guidance, reading promotion (e.g., booktalks, displays, author visits), direct instruction, and support of school community efforts. As with collaboration, the quality and extent of reading services needs to be ascertained in order to validly measure their impact on student learning.

A number of other **services** are also mentioned in studies as contributing to student academic achievement: reference service (Achterman, 2008), interlibrary loan (Baumbach, 2002), and community outreach (Faucette, 2000; Lance, 2001). For instance, when teacher librarians work with parents, students improve academically (Faucette, 2000). In general, teacher librarian expertise insures that students can use library resources more effectively.

It makes sense that running the library efficiently would impact student learning because resources would be organized for easier retrieval, for instance (Callison, 2004; Farmer, 2006). However, the attributes of efficient operations have seldom systematically studied relative to student academic achievement. The one indicator that has been identified is the presence of documented **library policies/ procedures** and a **plan** that included assessment (Farmer, 2006).

Financial support of SLMP has been identified more often as a significant factor with studies giving quantitative values (Farmer, 2003; Lance, Rodney & Russell, 2007; Scholastic, 2008). For example, having a bigger budget enables the teacher librarian to purchase more resources, so students have a greater variety of reading materials to choose from and they are more likely to improve their reading (Baxter & Smalley, 2003; Indiana, 2006; Lance, 2002).

Another source of power comes from **administrative support**. When SLMPs have such backing, they gain value and prestige that can translate into more resource allocations and greater chance for collaboration with the rest of the school community. These factors provide the support that offers a rich learning environment that can impact student achievement (Framer, 2006; Lance, Roday & Russell, 2007).

Goals and Objectives of the Research Project

The goal of the project was to develop baseline standards as well as service and quantitative resource standards for school library media program (SLMP) factors that provide the conditions for students to meet library outcomes, with a focus on California. Several relevant research questions emerged.

- Which SLMP baseline variables significantly support student academic achievement?
- Do SLMPs that meet baseline variable standards differ significantly from SLMPs that do not meet those standards?
- What are the service and quantitative resource standards that are significantly correlated with those SLMPs that meet the baseline variable standards?
- Are California SLMPs significantly different from SLMPs nationally?

Methodology

To answer the research questions, the investigators used a mixed methods approach: a content analysis of relevant literature, and statistical analyses to determine significant differences between populations.

Potentially significant variables were culled from a thorough review of the literature pertaining to SLMP factors that contribute to student academic achievement. Those variables that emerged from the content analysis were used as a tentative set of baseline SLMP standards.

To further validate the variables, a national school library survey sponsored by the *School Library Journal* (SLJ) was consulted (Shontz & Farmer, 2009). SLJ emailed the survey to a sample of more than 2000 of its subscribers. The survey researchers validated 780 responses (250 elementary, 168 middle school, 259 high school, 180 other combination of grades). In comparing the demographics of those responses with the most recent available

statistics about school libraries collection by the National Center for Education Statistics, the researchers found that the sample was representative of schools having professional librarians. To be established as a baseline standard for the current, at least half of the survey respondents had to meet that standard.

Once the baseline set of factors were determined, the California State Department of Education library data set was examined. The California State Education Code directs local governing boards to report on the condition of school libraries. Each year the library services department collects site-based data. The current study investigators had access to the 2007-2008 data set for the purposes of the study. California's data set consisted of 4832 responses (3312 elementary, 842 middle school, 595 high school, 83 other), which represented a response rate of 49% of total number of school libraries. A t-test was performed on the SLJ and California data sets to determine if a significant difference existed between the two, and none was found. A follow-up ANOVA statistical analysis determined the relative significance of the baseline variables, with variables being added one by one.

Next, the two data sets were divided into two sets: one that met all the baseline variable standards (CA1 and SLJ1), and the other set, which did *not* meet all the baseline variable standards (CA0 and SLJ0). A t-test was conducted to determine if a significant difference exists between set 1and set 2 relative to resource and service standards.

The two data sets that met the baseline standards were then examined to determine the quantity of other SLMP variables. Descriptive statistics (including quartiles) and factor analysis were conducted on the quantitative values of the resources of the data sets CA1 and SLJ1 (those that met the baseline standards) in order to determine the relative strength of each variable. For the *School Library Journal* 2009 study, the standards were based on the average resources and services of the set of respondents. For statistical standards (e.g., collection size), the standards were based on the average figures for the "baseline" set of respondents. For the California Department of Education 2007-2008 school library survey, the standards were based on the average resources and services of the "baseline" set of respondents. Findings were used to generate service and quantitative resource standards.

Findings

The following tentative set of standards for school libraries emerged from the meta-analysis and survey data set:

✓ One full-time teacher librarian (AASL, 2008; Achterman, 2008; Farmer, 2003; Lance, Rodney & Russell, 2007; LRS; Scholastic, 2008; Shontz & Farmer, 2009; Smith, 2008)
✓ One full-time paraprofessional (AASL, 2008; Achterman, 2008; Farmer, 2003; Scholastic, 2008; Shontz & Farmer, 2009; Sinclair & Tarr, 2005)
✓ Integrated library management system (cataloging and circulation), including online public access catalog (OPAC) (Lance, Rodney & Russell, 2007; Scholastic, 2008; Shontz & Farmer, 2009)
✓ Internet access for students (AASL, 2008; Achterman, 2008; Scholastic, 2008; Shontz & Farmer, 2009)
✓ Library open 36 hours or more per week (AASL, 2008; Achterman, 2008; Farmer, 2003; LRS; Shontz & Farmer, 2009; Sinclair & Tarr, 2005)

- ✓ At least some flexible scheduling (AASL, 2008; Farmer, 2003; Scholastic, 2008; Shontz & Farmer, 2009)
- ✓ Library web page/portal (Scholastic, 2008; Shontz & Farmer, 2009)
- ✓ Facilities: room and seating for one class and additional individuals, and the collection (AASL, 2008; Scholastic, 2008; Shontz & Farmer, 2009)
- ✓ One class set of computers (at least: 10 computers at the elementary level; 15 computers at the middle school level; 25 computers at the high school level) (AASL, 2008; Shontz & Farmer, 2009)
- ✓ At least two online subscription databases (one video/image based, and at least one periodicals aggregator) (AASL, 2008; Lance, Rodney & Russell, 2007; Scholastic, 2008; Shontz & Farmer, 2009); model baseline for text databases is one for elementary, two for middle school, three for high school (Shontz & Farmer, 2009)
- ✓ Regular planning with at least one grade or department of teachers (20% or more) (AASL, 2008; Farmer, 2003; Scholastic, 2008; Shontz & Farmer, 2009)
- ✓ Required services: readers' advisory/guidance, information literacy instruction, Internet and database instruction (even at elementary) (AASL, 2008; Achterman, 2008; Farmer, 2003; Scholastic, 2008; Shontz & Farmer, 2009; Sinclair & Tarr, 2005)
- ✓ Current set of policies and procedures, and a yearly strategic plan that includes assessment (Farmer, 2003; Shontz & Farmer, 2009)

A significant difference at the .01 level existed between CA1 and CA0, and between SLJ1 and SLJ0. The number of SLMPs that met all the baseline standards (SLJ1) was 209:

- 37 (14.8% of level's sample) elementary,
- 49 (29.2% of level's sample) middle school,
- 114 senior high (44% of level's population), and
- 9 other grade level combinations (8.7% of level's sample).

The number of SLMPs that met all the baseline standards (CA1) was 352:

- 13 elementary (0.4% of level's sample),
- 69 middle school (8.2% of level's sample), and
- 267 senior high (44.9% of level's sample), and
- 3 other grade level combinations (3.6% of level's sample).

The main variable differentiating those SLMPs meeting the baseline standards and those not meeting the standard was the presence of a full-time teacher librarian.

A follow-up ANOVA analysis revealed more nuances differences. For the *SLJ* data set, the only single factors that were significantly different from those libraries that did not meet the baseline standards were book collection size, information literacy instruction, and instruction on Internet use. In contrast, for the California data set, not only were those factors significantly different, but the following additional factors were also significant: flexible scheduling (or mix of flexible and fixed), book and non-book budget, copyright date (i.e., currency of collection), having a library web site/portal, having at least two subscription databases, and planning with teachers. In sum, "baseline" standard school libraries were significantly different from those libraries that do not meet the baseline standards.

Taking the average figure for the variables in data sets CA1 and SLJ1, the following resource standards were generated. When figures were significantly different relative to grade level, each set of figures was noted. When a discrepancy occurred between the two sets, both set of figures were noted. Figures were rounded to two significant figures for ease of reporting. The variables and figures were also validated by several research studies and the 2008 AASL survey of SLMPs.

- ✓ At least two-thirds of the print collection considered current (at least 50% of the collection more current than 1995 copyright date) (AASL, 2008; Achterman, 2008; California, 2008; Scholastic, 2008; Shontz & Farmer, 2009)
- ✓ Collection size base (based on number of volumes): 13,000 for elementary; 15,000 for middle school; 20,000 for high school (AASL, 2008; California, 2008; Farmer, 2003; Lance, Rodney & Russell, 2007; Scholastic, 2008; Shontz & Farmer, 2009; Sinclair & Tarr, 2005)
- ✓ Book collection ratio to number of students: 20 books/elementary student, 18 books/middle school student, 12 books/high school student (AASL, 2008; California, 2008; Shontz & Farmer, 2009)
- ✓ Collection development—adding books to the collection per year: 1 book/elementary student, 1 book/MS student, .5 book/HS student (California, 2008; Shontz & Farmer, 2009)
- ✓ At least $5000 spent on books (all grade levels) (California, 2008); note that on the national level that baseline amount would be $8000 (AASL, 2008; Scholastic, 2008; Shontz & Farmer, 2009)
- ✓ At least $2000 spent on non-books for elementary; $4000 for middle school; $4000 for high school (California, 2008); note that on the national level all grades would be $4000 (AASL, 2008; Shontz & Farmer, 2009); note that since California does not have a statewide subscription database agreement, the elementary figure could be raised to $4000 taking into consideration county subscription databases
- ✓ At least $500 spent on print periodicals (all grade levels) (California, 2008; LMS; Shontz & Farmer, 2009)
- ✓ Total materials budget: standard of $7,000 for elementary, $9,000 for middle school and high school; alternatively $8000 for all levels (the baseline median is $4000 for elementary, $7500 for middle school, $8000 for high school, California, 2008); note that the national average figure is $8000 for all levels, whether the SLMP met baseline standards or not (AASL, 2008; Shontz & Farmer, 2009)
- ✓ Total material budget per student: $12/elementary student, $8/middle school student, $4/high school student (California, 2008); note that the national average figures are $14/elementary student, $12/middle school student, $8/high school student (baseline or not) (Shontz & Farmer, 2009)

Discussion

The California and national data sets confirmed the findings of dozens of studies correlating school library variables and student academic achievement.

The two linked base standard variables most likely to be absent were staffing: having both a full-time teacher librarian and a librarian paraprofessional. In general, about three-quarters of California high school libraries have teacher librarians; national and state percentages of school libraries that met base standards was about the same: 44. That

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percentage of teacher librarians drops down to about half in middle schools and 17 percent in elementary settings. Therefore, it is no surprise that less than a half percent of California elementary school libraries met all the base standards, as opposed to almost fifteen percent of counterparts nationwide. That situation also differentiates California and national school libraries at the middle school level; less than 10 percent statewide versus almost thirty nationwide. Indeed, the teacher librarian per student ratio is the lowest in the nation, largely due to lack of professional staff at lower levels. Furthermore, teacher librarians are less likely to have a paraprofessional librarian on staff in California.

Almost every school library in the national data set had an integrated library management system and adequate facility. Statewide licenses enabled most school libraries to have subscription databases; California is one of the few states not to have such agreements. Concurrently, most libraries had computers, at least for the staff. Internet-connected computers and student access to online information were also the norm nationwide, although less likely in elementary than in middle and high schools. Similarly, fixed scheduling was more likely in elementary than higher level schools.

Because several of the base standards were normal among the nationwide sample, the differentiation between those that did or did not meet the standard for both state and national data sets – at all school levels -- were book collection size and instruction: about information literacy and Internet use. This finding held, regardless of the school enrollment. With more resources, more instruction existed for students to know how to use those resources. Having more resources would also imply that more management was required, thus the need for qualified and trained professionals.

California libraries were more uneven in terms of the presence of base standard variables, so that more differentiated factors emerged when comparing CA1 and CA0 item by item. Some California schools have a limited web presence along with no online subscription databases, so their school library would be less likely to have a website or portal. Technicians are not required at each school either, so web page development can also be impacted. A few years ago, a state "digital high school" initiative assisted schools in cabling, but that project did not reach down fully to middle schools and did not touch elementary sites. Along with library staff possibly not having web design training, it is not surprising that library portals would be a differentiating variable. A greater proportion (usually elementary) had only fixed scheduling. This situation sometimes arose because the teacher librarian was the supervising teacher when the regular classroom teacher had a preparation period. The same situation would also explain why teacher librarians were less able to plan with classroom teachers: little common time existed to plan together. Because library funding is usually site- or district-determined, rather than state-mandated, library budgets also varied significantly between CA1 and CA0. Some teacher librarians are wary of thorough de-selection/weeding of materials, fearing that the shelves would look barren, so older books remain, making the overall collection less current.

Other school library variables represented a range of values (e.g., periodical budget) rather the existence of a variable or lack thereof (e.g., library web portal). Thus, to generate valid quantitative figures that would represent base standards, the average figure of SLJ1 and CA1 data points were used. Each variable was handled independently, although correlations between variables did exist. However, the assumption was made that if half of the sample had the variable, it was a reasonable expectation. Nevertheless, a cumulative effect did exist. Only ONE California school library, a reputable middle school site in a well-to-do county,

met all of the base standards and the average quantitative values. California state has a long way to go to insure that its school libraries provide the conditions needed to enable students can succeed academically.

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