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Creating a Foundation for the Causal Relationship Between Libraries and Learning: A Proposed Application of Nursing and Public Health Research Methods

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Abstract:

Thomas Cook, a renowned causal research expert and professor of sociology, psychology, education, and social policy at Northwestern University (USA), called for school library researchers to parallel causality determination efforts in health-related fields. In this paper, we respond to Dr. Cook's challenge with a proposed research design centered on Mixed Research Synthesis (MRS) as part of process validated by the U.S. Department of Education and National Science Foundation's Common Guidelines for Education Research and Development. MRS studies, often used in nursing and public health research to develop causal theories, enable researchers to develop evidence summaries; identify and adjudicate rival and companion theories, and determine the active ingredients and weak links in the implementation chain of interventions, programs, and policies. MRS is the essential first step in a possible ongoing multi-phased research agenda designed to progress from theory building to

theory testing to causal determination. In addition to building on and extending school librarianship's heritage in replicated correlational research and strong affective value, the researchers' proposed MRS implementation will test the usefulness of a technique that has never been used in school settings and will provide a useful entry point for researchers concerned with other types of libraries.

Keywords: school libraries, effectiveness, causality, methodology

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Overview

Learning is a self-directed, ongoing, transferrable, and social process of applying understanding; information, a core element of this process, causes learning (Bransford, et al, 2000). Building on a successful National Forum Planning Grant in the IMLS National Leadership Grant (NLG) category and using current federal guidelines for effective research, the American Association of School Librarians (AASL) has outlined a three year research project within a multi-year research agenda that will establish a foundation to determine the direct link between school library programs and student learning. Results of this research are the unprecedented first steps in a longer agenda to document the vital role that libraries, as learning spaces, have in intellectual development and education.

In 2014, AASL held Causality: School Libraries and Student Success (CLASS), sponsored by an IMLS National Leadership forum grant. The stated outcomes of CLASS were to: 1) produce a white paper reflecting the key investigation points of school libraries and student learning; 2) establish a community of scholars; and 3) further operationalize the investigation points in CLASS II, a subsequent full scale research project designed to investigate the key points outlined in the CLASS white paper. CLASS II will establish a framework for causal research to document ways in which libraries help students learn knowledge, skills, abilities, dispositions, responsibilities, and self-assessments for life, college, and career readiness. We aim to engage library and information practitioners, supporters and advocates, education policy decision-makers, scholars, and lawmakers. The primary beneficiary of this project is the K–12 student.

Statement of Need

Multiple studies have suggested correlational relationships between strong school library program elements and academic achievement. Library Research Services, under the direction of Keith Curry Lance, published the first "Colorado Study" that reported a correlation between school library program components and student achievement (Lance, Wellborn, & Hamilton-Pennell, 1993). Subsequent correlational studies have consistently demonstrated a significant positive correlation between reading test achievement and particular elements of school library programs (Scholastic, 2008). These studies used factor analysis and regression modeling to isolate the external variables, such as poverty, that related to student achievement to isolate statistical significance that pertained to just the library-related results.

Foundational Research Evidence Supports School Libraries' Influence on Student Learning

Subsequent replications of the Colorado study correlated students' higher test scores with: 1) school library staff size (Baxter & Smalley, 2003; Baumbach, 2002; Lance, et al., 2001;

Smith, 2001; Lance, et al., 2000; Lance, et al., 1999); 2) presence of full-time, certified school librarians (Callison, 2004; Rodney, et al., 2002; Lance, et, al., 2000; Lance, et al., 1999); 3) frequency of library-centered instruction (Lance, et al., 1999) and collaborative instruction between school librarians and teachers (Lance, et al., 2005; Lance, et al., 2001; Lance, et al., 2000); 4) size and currency of library collections (Burgin & Bracy, 2003; Smith, 2001; Lance, et al., 2000) 5); networked library access to licensed databases (Lance, et al., 2002); 6) flexible scheduling (Lance, et al., 2005; Rodney, et al., 2003); and 7) school library budget size (Baxter & Smalley, 2003; Lance, et al., 2001). Although criticized for not resulting from an experimental design, the correlational findings strongly suggest that evolving research from a holistic perspective of "school libraries" and "student achievement" to research on specific program elements and learning outcomes unique to the school library is a promising direction.

Current Social and Education Challenges Demand Causal Research

Causal research is also warranted by two intertwined current reform movements in the United States: 1) the Common Core State Standards (CCSS), adopted by 46 states and influential in the remaining four; and 2) recent state-level requirements to provide evidence of college and career readiness (Advancing Competency-Based Pathways to College and Career Readiness, 2014). The shared goal of these movements is to "close the loop" between education and student learning by discovering causal relationships. Other areas of education have already moved to causal studies focusing on the degree to which educational practices, policies, teaching interventions, or out-of-school factors affect student achievement. Examples of these recent studies include the effects of class size reductions (Shin & Raudenbush, 2011), home environment disruption (Hanscombe, Haworth, Davis, & Plimin, 2011), socio-economic status (Schubert & Becker, 2010), family involvement (Evans, Kelley, Sikora, & Trieman, 2010), and principal leadership (Tubin, 2011). It is imperative for school library research to take its place among these studies. Because students' in-school and out-of-school learning experiences include the school library, it is essential to understand the school library's causal role. Education research that does not consider the school library's contribution is providing an incomplete, and possibly misleading, view of student learning.

Causal research has a vital practical application, too. The recent economic crisis has devastated school libraries. Over the last several years, AASL members have reported concerns about job loss, the trend to measure teacher effectiveness by test scores, and several states' job title reclassification of librarians from instructional staff to support staff which point to the immediate need to understand, demonstrate, and promote the causal relationships between strong school libraries and measurable student achievement.

Prior Efforts Outline an Agenda

The April 2014 AASL CLASS convening of leading school library researchers, practitioners, and educational research experts resulted in a call for causal research. Dr. Thomas Cook, one of the most influential methodologists in education and causality, guided this historic meeting anchored by an expert panel of scholars and practitioners from information science, library studies, and education. The panel was joined by 50 participants, including established and emerging researchers, scholars outside librarianship, state department of education researchers, consultants, and a representative from the American Library Association's Office for Research and Statistics.

CLASS participants discussed, debated, and examined relationships between student learning and school libraries to articulate the need for a research agenda to evidence causal phenomena in school library instruction, resources, and services. The CLASS Forum's discussion culminated in a published white paper[1] that included a consensus plan for a long-term three-phase school library research agenda to investigate causal relationships between school library program features and activities and student learning. This current phase of work, CLASS II, represents the first step on that research agenda.

Impact

The 2014 CLASS forum resulted in a comprehensive research agenda focusing on school libraries and learning, as outlined in Figure 1.

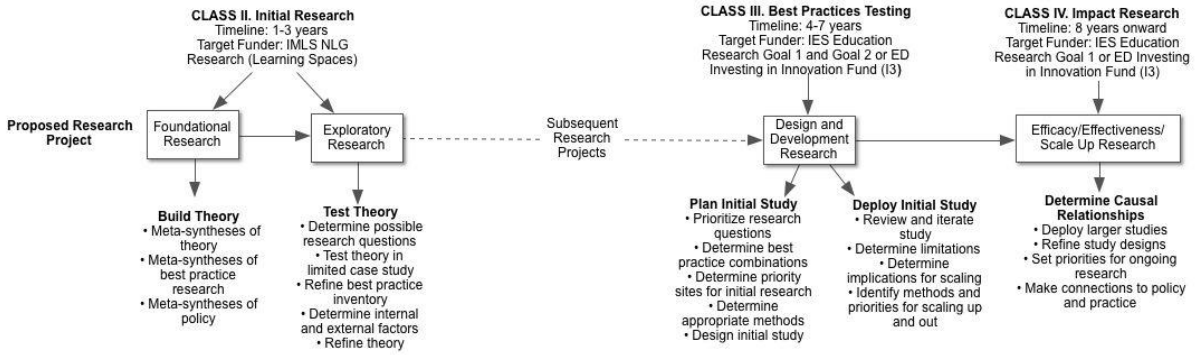

Figure 1. CLASS causal research agenda

As Figure 1 shows, the CLASS II project described in this paper represents two unique phases with long-lasting, sustainable, and precedent-setting impacts for education research. The purpose of CLASS II is to build and test theory around the causal relationship between school library activities and student learning as well as to identify best practices in imparting those causes. This CLASS II research will be followed later by two additional projects: CLASS III will develop the best ways to operationalize those best practices in preservice and professional learning as well as develop methods of assessment. Finally, CLASS IV will allow the researchers to scale up these best practices to reach a large number of professionals and operationalize an ongoing research and assessment agenda. We propose that this entire research plan will take at least eight years; however, without the work outlined in this paper, we can never move toward realizing causal-based understanding of the power of school libraries.

Unprecedented Research for School Library Scholars and Practitioners

Mardis (2007) suggested that "correlation should be the starting point, not the focus of advocacy, since it is so often misinterpreted or over-claimed." The CLASS National Forum was a consensus-building initiative that brought together the best minds in school library research and related fields to start the ongoing dialogue representing a national agenda focusing on libraries and learning. Participants have begun to engage and network with fellow scholars across disciplines to focus on the broad common ground of educating students for the twenty-first century. In June 2014, the CLASS white paper authors

[1] Download at:
http://www.ala.org/aasl/sites/ala.org.aasl/files/content/researchandstatistics/CLASSWhitePaperFINAL.pdf

facilitatied discussion session at the ALA Annual Conference. The powerful combination of influential participants, a published white paper, and the design of a subsequent study justifies CLASS II's efforts to extend prior research by identifying key competencies, categorized as cognitive, interpersonal, and intrapersonal, that relate to knowledge construction and deep learning through the school library.

This initiative moves the national school library research agenda toward the causal analyses underlying the differences school librarians can make for students from diverse backgrounds, poverty, and special needs. As research suggests access to strong school library programs staffed with certified professionals is not equitable (Pribesh, Gavigan, & Dickinson, 2011), CLASS II will provide the library fields and school librarians at all levels and in all kinds of schools a voice, amplified by scientific and generalizable proof, with policy and decision-makers to advocate for adequate resources and equitable access to school library programs to help students be academically successful. Increasing the proliferation of causal school library research will provide cause-effect inferences to decision-makers at all levels and will delineate the evidence that points to the causal effectiveness of the school library program.

This evidence has the potential to result in targeted funding, increased staffing, and operational support for school libraries and the students they serve. Through examination of the methodological strengths and weaknesses of the studies, recommendations can be made about next steps in evaluating the impact of school libraries on student achievement, and help determine methodologies where further research is warranted. Meta-syntheses will help identify key features of educational interventions that can be used as indicators that an intervention is likely to develop the key skills needed to have significant positive impact on student performance.

Building a Community of Practitioner/Scholar Partners

The research outline in this paper will encourage and support continued networking of a community of scholars. The participant scholars will collaborate with the principal researchers to design experimental case studies that exemplify the principles of causal methodologies and that will be a model for future studies. The researchers will use a forum design that allows for constant and iterative feedback that raises the profile and impact of this project. The researchers will also use an iterative process that builds in a level of redundancy, ensuring that all products are completed even if a scholar cannot remain with the project. This iterative process ensures multiple perspectives concerning each research area. CLASS II will foster the rich discussion necessary for the development of causal research and school libraries.

Project Design

Using the process outlined in *Common Guidelines for Education Research and Development* (Institute of Education Sciences & National Science Foundation, 2013) for developing causal research agendas, the CLASS final report specified three phases for a long-term research agenda. In this proposed research, we will address the first phase of that agenda by using meta-syntheses and case study to derive causal theories that will be explored on a small scale; subsequent research projects will test and refine the theories further and culminate with an impact research study in which we will later conduct efficacy/effectiveness research. We project that a long-term structured research agenda will take years to complete and will ultimately place school library research in line with federally-recognized scientifically based

empirical research. Unlike action research or other opportunistic studies, each part of the research agenda builds on the one before, all leading to the ultimate goal of research that clearly denotes the causal implications of school library practice.

The goal of the research proposed here is to establish a theory of the causal relationships between school libraries and student learning by pursuing the research question "What causal relationships between school-based malleable factors and student learning are present in published research?" This intent of this question is for us to first look outside of school libraries for causes of student learning and then to examine them within the context of school library programs. We define "school-based factors" to mean learning activities that occur within and beyond school, such as classroom instruction, after school programming, or other malleable factors. We will operationalize this goal in two research activities, metasynthesis and explanatory case study.

Research Phase 1: Theory Building with MRS Metasyntheses

In this research activity, we will conduct metasyntheses to distill likely causes of learning from published research. In line with the theory building process outlined in the *Common Guidelines*, CLASS II researchers will first identify activities and features that show promising relationships with student learning using three independent concurrent meta-syntheses of current education policy, theory, and best practices research. The meta-syntheses results will be integrated and refined to establish a list of possible causal features that may be present in school library program activities. This list will provide a foundation for subsequent systematic, causal investigations of school libraries as learning spaces. The meta-syntheses will also screen for methodologies for discovering and documenting what works for the school library learning space.

At the conclusion of the CLASS National Forum event, keynote speaker Dr. Thomas Cook called for researchers to follow parallel causality determination efforts in nursing and public health. This foundational research will be conducted using Mixed Research Synthesis (MRS), a method often used in nursing and public health research (Sandelowski, Voils, & Barroso, 2006). "Mixed" are the objects of synthesis (i.e., the findings appearing in written reports of empirical qualitative, quantitative, and mixed methods studies) as well as the mode of synthesis (i.e., the qualitative and quantitative approaches used in the studies). The MRS method was chosen as a strong way to develop evidence summaries, to develop an understanding of rival theories, and the determination of the active ingredients, effectiveness, and weak links in the implementation chain of interventions, programs, and policies (Pawson, 2006).

MRS Step 1. Aggregation. In this step, researchers will identify peer-reviewed published research on causes of student learning published between 1985 and 2015. Per *Common Guidelines* requirements for foundational research (IES & NSF, 2013), researchers will focus on empirical research arising from applications of theory, best practice reports, and implementations of policy and will conduct searches of the relevant databases and library catalogs. To compile the initial corpus, researchers will agree upon an initial Boolean search phrase such as "cause and student and (learning or achievement)." Researchers will keep track of the searches they conduct by recording date, source, search string and filters, citation, and number of results. Publications will then be reviewed for relevancy to the research question.

MRS Step 2. Synthesis. To identify possible learning outcomes that directly result from library learning space activities, the researchers will review the corpus of studies aggregated in MRS Step 1 using the Integrated MRS design with a top-down configuration synthesis method. In an integrated MRS, studies in a targeted domain are grouped by findings viewed as answering the same research questions, or addressing the same aspects of a target phenomenon (Sandelowski, Voils, & Barroso, 2006). An Integrated MRS with top-down configuration entails counting, tabulating, diagramming, and narrating thematically diverse individual findings, or sets of aggregated findings, into a coherent theoretical rendering. Figure 2 depicts a sample analysis conducted with an Integrated MRS.

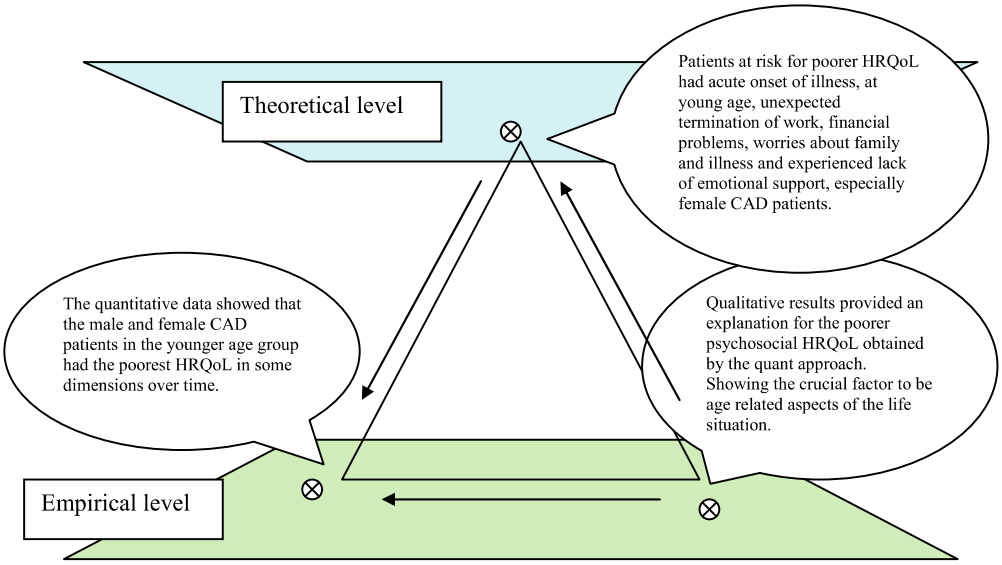

Figure 2. Sample MRS findings integration

Findings in configuration syntheses may contradict, extend, explain, or otherwise modify each other. In configuration synthesis, researchers link findings, even though these links may not have been addressed in any of the primary studies reviewed. This particular approach is well suited for the proposed study because it can identify promising causal relationships that must be extrapolated from the original study context (Sandelowski, Voils, Leeman, & Crandell, 2012).

Research Phase 2: Theory Testing with Explanatory Case Studies

Once the list of promising causal elements has been identified, again guided by the best practices promoted in the *Common Guidelines*, the research team will solicit five case studies in which CLASS II researchers will work collaboratively with practitioners to test the presence of the factors emerging from the MRS meta-syntheses.

The Theory Testing portion will be driven by the research question, "To what extent do the causal relationships between school-based factors and student learning offer possible causal relationships between school libraries and student learning?" In collaboration with the advisory board, the CLASS II research team will develop training, scaffolds, and reporting structures for the case studies. The advisory board will solicit up to five case study proposals from members of the CLASS National Forum Community of Scholars, AASL members, and the national school library community to conduct up to 5 structured explanatory case studies (Yin, 2013) relating to school library program activities and one or more of the causal

elements found through the meta-synthesis process. Case study researchers will work closely with the CLASS II research team to ensure that data are collected and analyzed properly and communicated in a consistent format.

Explanatory case studies are used to gain insight into presumed causal links in real-life interventions. The explanations arising in the case studies will speak to potential links between program implementation and program structure. The outcome of the case studies will be a promising best practice inventory that will be submitted to an implementation advisory committee for dissemination to the field.

Conclusion

In this paper, we outlined CLASS II, a multi-part several-year research agenda through which we propose to investigate the causal relationship between school library program variables and positive student outcomes. This research agenda is guided by the *Common Guidelines for Educational Research and Development* produced by the U.S Department of Education and National Science Foundation. We established the warrant for the agenda in April 2014 with CLASS, a National Forum of scholars and practitioners, and propose the next step of generating possible theoretical relationships using the MRS research synthesis technique, a method adapted from research in nursing and public health validated explanatory case studies conducted by school librarians in the U.S. We posit that looking to these two adjacent disciplines will allow researchers from school librarianship to establish the causal evidence crucial to create and maintain policymaking priorities.

The mixed method research design employed in this project will test the usefulness of the MRS technique, which has never been used in school settings, and of confirmation through explanatory case study. The MRS technique and the researchers' implementation will provide a very useful entry point for researchers concerned with other types of libraries, as will the researchers' use of subsequent data gained through best practice case studies. This project would create a model for causality research in schools. Just as the correlational studies began to be recreated, it is expected that this model would also be repeated in additional studies. The foundation provided by the 2014 CLASS Forum ensures that this thoughtful approach is the most efficient, effective, and reasonably appropriate to the scope of the project.

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