IES PRS

Application Profile

Application Number: R372A05146

Competition: 84.372A05 **Date Entered:** 6/30/2005

Organization Information

Organization Name: Wisconsin Department of Public Instruction

Organization Unit: Information Technology

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Collaboration Organization(s)

Organization Name	Organization Type	State	Country	Key Personnel	Role on Project
University of Wisconsin System	Public College or University	WI	United States of America	Meyer, Robert	PI, coordinate collaborative cross-state research
				Thorn, Christopher	Co-PI, technology lead and coordinate collaborative cross-state research on systems and tools
Minnesota Department of Education	State	MN	United States of America	Wagner, Cathy	Project Director, coordinate collaborative cross-state efforts
Michigan Department of Education	State	MI	United States of America	Ropp, Margaret	Director, CEPI
				Pung, Linda	Client Services Director, CEPI
				Roeber, Edward	Sr. Executive Director, Office of Educational Assessment and Accountability
				Galloway, MaryAlice	Special Assistant to the Chief Academic Officer
				Gover, Mark	Educational Consultant, CEPI

Application Title

Longitudinal Data Systems to Support Data-Driven Decision-Making: Wisconsin

State Identifier

Period of Performance

Project Begin Date: 11/01/2005 **Project End Date:** 10/31/2008

Abstract

1. The title of the project: Longitudinal Data Systems to Support Data-Driven Decision-Making: A Proposal from Wisconsin

2. The RFA goal under which the applicant is applying: Design, develop, and implement statewide longitudinal data systems.

3. The potential contribution the proposed project will make to the solution of an education problem: Many states, including our own, are ill-equipped to manage and effectively use the data states are now required to collect as a result of NCLB requirements and other state and federal

policy initiatives. The goal of this project is to create a multi-state longitudinal data system that will enable educational stakeholders to conduct value-added and other diagnostic and policy-relevant evaluation research and engage in data-driven decision-making, with the ultimate goal to improving student achievement for all students and all schools. In order to achieve these goals, our project is structured so that all design decisions will be fully informed by a thorough understanding of end-use requirements and, more generally, by the needs of all educational stakeholders: parents and students; teachers; school, district, and state leaders and program staff; and policy makers. One of the major benefits of reaching out to stakeholders is that we expect that the longitudinal data system developed during the course of this project will in some sense be owned by these stakeholders. One of the distinctive aspects of our proposal is that it reflects a genuine collaboration among three states and the Wisconsin Center for Education Research. Working together will permit each state to share responsibility for at least fifty percent of all project tasks, thereby in effect more than doubling the impact of the resources allocated to each state. Moreover, by structuring work products so that they can be shared across the Tri-State Partnership, we expect that these products will be of value to states that are not explicitly part of our collaboration. Project results and products, including overview papers that describe the concepts and strategies used in this project, will also be disseminated via conferences and workshops.

4. The population(s) from which the participants of the study(ies) will be sampled (age groups, race/ethnicity, SES): The longitudinal data system developed by this project will include data on all students enrolled in PK-12 education. Collaborating with state partners in the PK-16+ Initiative, we expect to extend the longitudinal data system to include students enrolled in higher education.

5. The proposed research method(s): The project has been divided up into distinct task areas: data analysis and research requirements, data access, data dictionary, data warehouse, and secure data transport. Specific research methods for each task area are presented in detail in the proposal. Each state and WCER has been assigned a specific level of responsibility for each task and subtask: (1) primary responsibility, (2) secondary responsibility, or (3) review and implementation. In addition, tasks and subtasks are broken down into discrete parts that can be designed and implemented in phases. This approach is required because we have end-use applications that we are eager to support and because incremental implementation of our warehouse design is the best way to build local support for the overall project. The proposal provides details on the phased implementation of three types of activities: shared cr

Human Subjects: No **Exempt from Regulations:** No **Exemption #:** **Assurance #:**

Exempt Narrative:

Non-Exempt Narrative:

Estimated Funding

Federal:	$1,142,000.00	**Local:**	$0.00		
Applicant:	$0.00	**Other:**	$0.00	**Total:**	$1,142,000.00
State:	$0.00	**Program Income:**	$0.00		

Federal Budget

Budget Categories	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1. Personnel	$200,000.00	$200,000.00	$200,000.00	$0.00	$0.00	$600,000.00
2. Fringe Benefits	$120,000.00	$120,000.00	$120,000.00	$0.00	$0.00	$360,000.00
3. Travel	$20,000.00	$15,000.00	$10,000.00	$0.00	$0.00	$45,000.00
4. Equipment	$350,000.00	$150,000.00	$250,000.00	$0.00	$0.00	$750,000.00
5. Supplies	$2,000.00	$2,000.00	$2,000.00	$0.00	$0.00	$6,000.00
6. Contractual	$400,000.00	$400,000.00	$400,000.00	$0.00	$0.00	$1,200,000.00
7. Construction	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
8. Other	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
9. Total Direct Costs	$1,092,000.00	$887,000.00	$982,000.00	$0.00	$0.00	$2,961,000.00
10. Indirect Costs	$20,000.00	$20,000.00	$20,000.00	$0.00	$0.00	$60,000.00
11. Training Stipends	$30,000.00	$20,000.00	$10,000.00	$0.00	$0.00	$60,000.00
12. Total Costs	$1,142,000.00	$927,000.00	$1,012,000.00	$0.00	$0.00	$3,081,000.00

Non-Federal Budget

Budget Categories	Year 1	Year 2	Year 3	Year 4	Year 5	Total

1. Personnel
2. Fringe Benefits
3. Travel
4. Equipment
5. Supplies
6. Contractual
7. Construction
8. Other
9. Total Direct Costs
10. Indirect Costs
11. Training Stipends
12. Total Costs

Application Details

D-U-N-S Number:	(b)(2)	T-I-N:	396006487	Duration (years):	3
Any Federal Debt:	No	Specify:			
Type of Applicant:	State	If Other, Specify:			

Authorized Representative Information

AR Name	AR Address	AR Phone	AR Fax	AR E-mail	Primary:
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Introduction

The No Child Left Behind (NCLB) act requires states to publish annual achievement, attendance and graduation data for students in grades three thorough eight and high school, along with a full set of demographic information. Schools and districts are additionally required to use this data to inform continuous improvement decisions at the local level. The good news is: federal policy has resulted in the creation of truly robust state-level data sets for the first time. The bad news is: many states, including our own, are ill-equipped to manage the data and facilitate effective decision-making for school improvement.

We are pleased to submit a proposal in partnership with Minnesota, Michigan, and the Wisconsin Center for Education Research (WCER) to build a comprehensive multi-state longitudinal data system (LDS). We have taken the goals of this grant program very seriously: "to build data system capacity to: generate and use accurate and timely data to meet Federal, State, and local reporting requirements; allow for value-added and other diagnostic and policy-relevant research; engage in data-driven decision-making; and improve student achievement." In order to achieve these goals, our project is structured so that all design decisions will be fully informed by a thorough understanding of these end-use requirements and, more generally, by the needs of all educational stakeholders: parents and students; teachers; school, district, and state leaders and program staff; and policy makers. One of the major benefits of reaching out to stakeholders is that we expect that the longitudinal data system developed during the course of this project will in some sense be owned by these stakeholders. A sense of ownership and shared purpose is important if we expect stakeholders to fully support the operational requirements of the longitudinal data system and to "buy in" to the strategy of using data to drive student achievement.

One of the distinctive aspects of our proposal is that it reflects a genuine collaboration among three states and the Wisconsin Center for Education Research – hereafter referred to as the tri-state partnership.[1] We recognized early on in the process that a collaborative approach offered many key advantages. First, working together will permit each state to share responsibility for at least fifty percent of all project tasks, thereby in effect more than doubling the impact of the resources allocated to each state. Moreover, by structuring work products so that they can be shared across the tri-state partnership, we expect that these products will be of value to states that are not explicitly part of our collaboration.[2] Second, as we discovered, each state has unique pockets of expertise that we will be able to exploit to produce the best possible LDS products. We suspect that no state possesses, or has access to, the complete spectrum of expertise required for this project. Third, we recognized that it would be productive to partner with a national research center such as the WCER that is experienced in large scale data analysis and data-driven instructional systems. WCER is a particularly appropriate collaborator for the tri-state partnership because of its extensive track record working with educators and policy makers in Michigan, Minnesota, and Wisconsin. Fourth, we quickly realized that working as state collaborators will force us to confront the challenges of building and adopting data dictionary and warehouse specifications that are universally shared. Finally, by approaching our

[1] Table 1, discussed later in the proposal, lists cross-state collaboration and task responsibilities by state.

[2] As discussed later in the proposal, we plan to disseminate these products via a project website and via conferences and workshops targeted at educators, educational researchers, and the informational technology community.

work in a fully collaborative manner, we hope to contribute to the process of building a network of districts and states that shares a common interest in data-driven decision-making.[3]

Another major strength of our project is that it is not a stand-alone venture. Rather, it is a project that builds on the distributed expertise of organizations involved in supporting data-analytic activities in the tri-state area and throughout the nation, including:

- Large urban districts, such as Minneapolis and Milwaukee, pioneers in the use of value-added analysis
- State regional organizations, such as the Cooperative Educational Service Agencies (CESAs) in Wisconsin, agencies that provide assistance to school districts
- National technical and data standards boards
- Software vendors that produce applications to support data storage and analysis
- States that have developed exemplary solutions to collecting, storing, and analyzing educational data
- Postsecondary institutions (also involved in building data warehouses)

We discuss how we draw on expertise from these organizations later in the proposal. Although the primary focus of this project is on developing warehouse capacity at the PK-12 level, we have solicited the support of higher education institutions in our states and are pleased that we will pursue strategies to link PK-12 and higher education data, thereby yielding data warehouses that span pre-kindergarten through college and graduate school.

One important implication of the fact that some districts and organizations may support data-analytic activities above and beyond those sponsored by the state is that it is helpful to conceptualize state data warehouses as being only one part of a larger warehouse structure that also includes regional and district warehouses (although not all districts may be represented at all three levels). Rural districts, in particular, may rely entirely on a state data warehouse, whereas large districts may support data warehouses that contain data above and beyond the data contained in a state data warehouse.[4] This implies that states need to coordinate with districts in the design of data collection strategies so as to minimize the burden of data collection. Secondly, as discussed extensively later in the proposal, it is essential to design data warehouse structures so that data can freely be exchanged between schools and districts.

One of the organizing principles for this project is that we plan to break down tasks into discrete parts that can be designed and implemented in phases. This approach is required because we have end-use applications that we are eager to support, and because incremental implementation of our warehouse design is the best way to build local support for the overall project. The project timeline (Appendix A) provides details on the phased implementation of three types of activities: shared cross-state activities (such as development and adoption of data dictionary specifications), state-specific implementation of products (such as the data portal to support data access by various stakeholders), and end-use applications (such piloting a state value-added system).

We believe that this project will provide a major impetus to transforming the state educational agencies in Michigan, Minnesota, and Wisconsin and, in particular, the ways in which state agencies interact with and support schools and districts, cooperate amongst themselves and with institutions of higher education, and operate internally. One immediate

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[3] Several districts, including Minneapolis, Milwaukee, Mounds View (Minnesota), and Cleveland are currently working with WCER to develop a self-help network to support value-added analysis and other data-analytic activities.

[4] See Figure 3 in Appendix B for a schematic picture of alternative state, regional, and district warehouse configurations.

benefit of writing this proposal is that state department divisions that have not previously interacted are now talking. One common thread among the three states involved in our project is a collective willingness to leap-frog to a different level, one in which data analytic activities play a key role in decision making at all levels of the educational system.

In the next section of the proposal we discuss the need for this project from the standpoint of Wisconsin. Subsequent sections present the details of the project organized into five major task areas: data analysis and research requirements, data access, data dictionary, data warehouse, and secure data transport. In recognition of the fact that this project involves substantial cross-state collaboration, significant parts of the proposal were written collaboratively and are identical in the three state proposals. The project narrative also incorporates examples from all three states. At the end of each section we include short sections that comment on issues unique to each state

Need for Project

In 2004 the CELT Corporation, in conjunction with the Council of Chief State School Officers (CCSSO), conducted a comprehensive review of Wisconsin's information infrastructure, and ability to meet the federal No Child Left Behind (NCLB) data collection and reporting requirements[5]. The CELT review found the Wisconsin Department of Public Instruction (DPI) in need of "staffing, funding levels, and decision support systems and tools required to support Wisconsin's LEAs in realization of the State's educational goals for its students."

Wisconsin's needs stem from key historical and structural issues. Traditionally, DPI funding for technology initiatives has centered around a particular program. This has led to the implementation of different systems with limited and specific purpose, serving a particular mandate. Many of these "stove-pipe" systems do not share information, because they were not meant to serve as data resources for the agency at the outset, and were vigorously independent. DPI has long operated under the following premise: "…data is stored as [the U.S. Department of Education] previously required them, in individual Titled Program Area data bases. Existing systems can be changed but not quickly, so states must develop systems to pull data from many different locations."[6]

Demands for data have evolved rapidly in the past few years. Information previously gathered to meet narrow reporting requirements is now needed across the agency. DPI today has clearly evolved into an information clearinghouse—expected to work as an enterprise, rather than in pieces. This move towards systemic thinking is quite recent. The CELT report stated that, "Until the recent emergence of the New Wisconsin Promise as a unifying strategy and game plan, the five divisions within DPI have acted like semi-independent agencies."

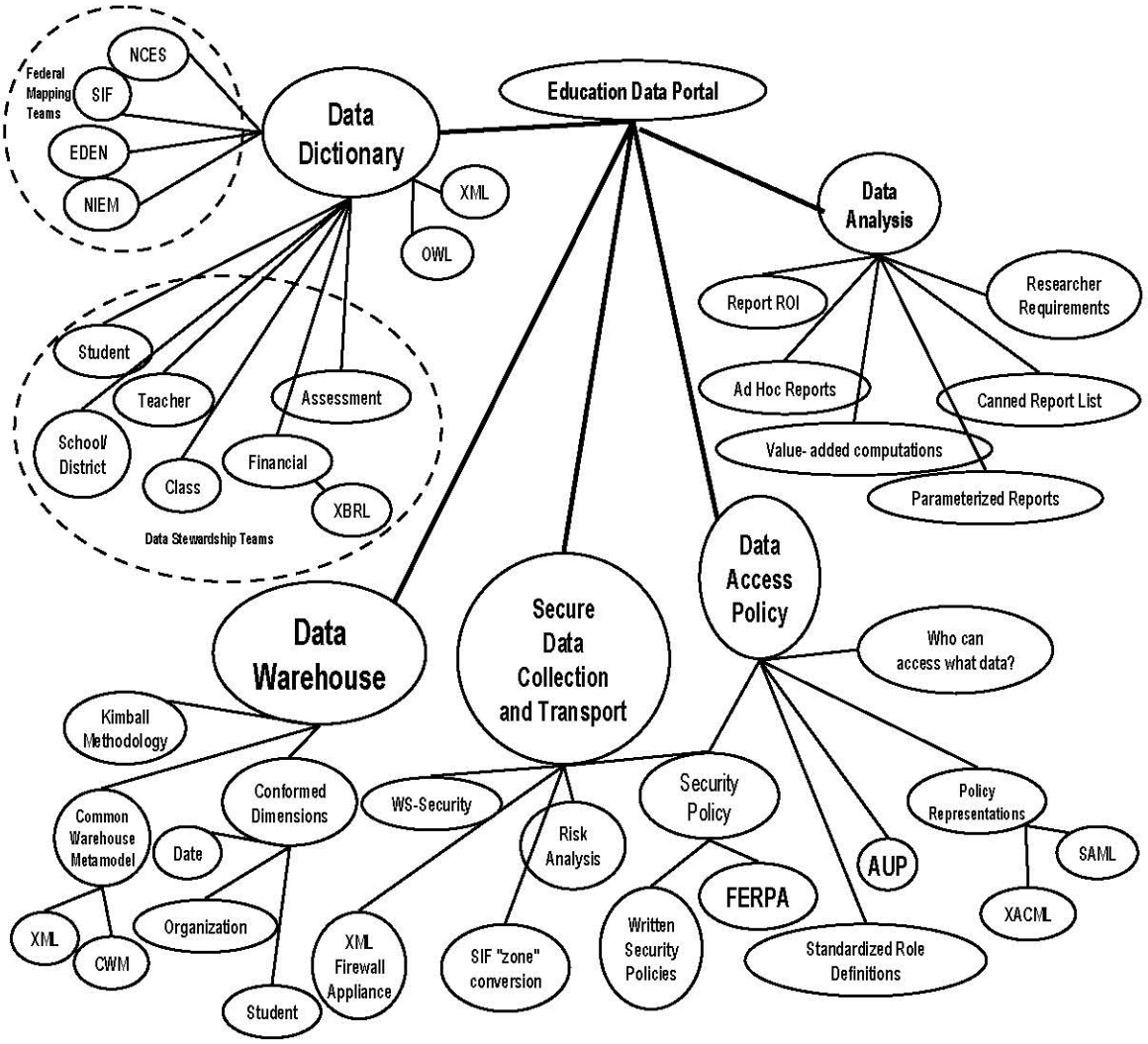
It is not uncommon to encounter long-time program administrators who ask if a new effort is truly necessary. The question they pose is whether existing data couldn't be used to answer new questions? In most cases, unfortunately, it cannot. New enterprise demands require a level of consistency in data definitions that simply did not exist in early data collection efforts. When it was not necessary to track individual students or teachers, aggregate data was sufficient to meet accountability and management requirements. Aggregated data answers the specific questions for which the report was built but cannot be disassembled. In fact, many data collections were only at the grade or classroom level—no individual data may even exist. In

[5] CCSSO/CELT Decision Support Architecture Consortium's Report to the Wisconsin Department of Public Instruction, April 6, 2005. For a summary of findings see Table 4 in Appendix B.

[6] "EDEN Submission Recommendations" (2005), DPI Internal Memo, February, 2005.

national large scale assessment meetings to discuss process to date and exchange best practices with other SEAs and partnerships.

Figure 1. Longitudinal Data System Mind Map



Design

In creating a tri-state strategic plan we have identified five key components necessary to accomplish the long-range strategic goals of implementing a data portal, designing a warehouse, and creating linked data sets. These are: (1) data analysis and researcher requirements, (2) data access policies, (3) data dictionary, (4) data warehouse, and (5) secure data transport.

Each state has agreed to share documentation on requirements gathering, design and functional specifications, testing plans, and user training materials. Collaboration among the partners will occur primarily in the requirement gathering and design phases. Consultation among partners will continue across all phases. Figure 1 shows the primary design considerations for each component of the shared strategic plan, and Table 1—the tri-state task matrix—(in Appendix A) outlines the respective contributions of each of the partners to each design component.

Wisconsin Notes

Wisconsin will fully collaborate in every aspect of the shared strategic plan. The partnership explicitly recognizes that each state is at different stages of development and has different particular areas of emphasis, given their specific needs. The tenets of Model Driven Architecture (MDA) will drive each of the designs, but the Wisconsin project team will focus more of its efforts on developing *data architecture* and *vertical integration.*

Good data architecture is central to the success of any enterprise system. An agency-wide inventory of data needs and data use will be used to develop a data model for DPI. This model will be tested against the existing and anticipated business needs of the agency. This effort will position the warehouse and related efforts at the center of the work of agency.

Wisconsin's uniquely fragmented educational structure and prevalence of local control under the coordination of a state agency require additional emphasis on vertical integration. In order to provide a plan to implement an SEA data warehouse and data extraction tools for LEAs, parents, and federal purposes, Wisconsin must work closely with LEAs. Given the relative autonomy of LEAs in Wisconsin, DPI must normally show that any state data collection is either federally mandated or provides a desirable new service. Services seen as desirable typically (a) reduce the overall data reporting burden and/or (b) provide additional services to each district by adding value to its data collection.

Another core aspect of this initiative will be a model that supports parallel development of state and local data warehouse systems. As districts consider both local analytical needs and data confidentiality issues, the partnership's support for a service-oriented architecture (SOA[9]) that supports collaboration between state-level and locally developed services becomes a critical element of the project.

The deployment of an SOA model allows LEAs to draw on the resources of a statewide data warehouse in combination with local data to provide locally relevant solutions. This service model is particularly important for larger districts that have made significant investments in developing unique data tools and in the professional surrounding the use of those tools. An SOA model provides a framework for support of locally-developed district solutions while expanding DPI's ability to collect, organize and share data within the state. This architecture also supports NCLB requirements and delivers economies of scale across many program areas.

I. Project Design: Data Analysis and Research Requirements

The central driver behind the development of a data warehouse is the desire to provide better decision support services across the PK-12 system. In order achieve this goal, Michigan, Minnesota, and Wisconsin will examine the results of requirements analysis done by other states and check those results against the needs of our own stakeholders. The data collection for the requirements analysis will be done through a series of focus groups and surveys across state-, regional-, and district-level program managers, district and school leaders, teacher leaders and specialists, and representatives of the larger PK-20 system.[10]

WCER research staff will coordinate and support much of the data collection and analysis efforts for the Tri-State efforts. WCER will also leverage knowledge gained in other related longitudinal analysis work occurring in other large projects to take advantage of the latest

[9] Service Oriented Architecture is term used to describe loosely coupled-collaboration between applications. See http://www.javaworld.com/javaworld/jw-06-2005/jw-0613-soa.html for more information.

[10] See the letters of support in Appendix B of the proposal for a sample of supporting groups. They include urban, suburban, and rural districts as well as PK-20 partnerships.

addition, the fact that many data collections occurred at different times over the course of the year meant that issues such as differing item definitions between collections, and student mobility across collections created discrepancies in results that were difficult and time consuming to resolve.

Most of difficulties described above could be addressed through the development and implementation of a state data warehouse. DPI's focus on improving communication and information-sharing has been increasingly directed towards encouraging and facilitating the design of enterprise-wide technology solutions. This effort to work on enterprise-wide issues is supported by the Wisconsin Department of Administration and the state CIO. The DPI warehouse project is seen as a mechanism for delivering both operational and analytical efficiencies.

As Wisconsin develops a state data warehouse, the project team will be working in parallel with existing data warehouses at some of the larger school districts in the state. Additionally, we will leverage Wisconsin's Cooperative Educational Service Agencies (CESAs), who act as regional administrative service providers, delivering economies of scale to smaller districts. For smaller and medium size districts, the state data warehouse can provide services that do not currently exist at a district level or the CESA.

While DPI has made some progress toward these goals through a recent planning grant and several related internal initiatives (particularly the roll-out of the Individual Student Enrollment System—ISES), the need for fundamental structural changes remains. These changes will require significant additional funding and unflagging support from senior leaders in order for DPI to achieve the level of data-based decision support services that are increasingly required. Obtaining additional state funds is unlikely given the current fiscal climate. The Longitudinal Data Systems grant is a unique opportunity for Wisconsin to invest in data architecture and data warehousing, and invest the political capital on needed internal restructuring necessary to support agency-wide integration.

The following paragraphs summarize the status of DPI's systems based on the required systems components under the Longitudinal Data Systems grant.

(1) A uniform statewide student ID (Low area of need). Wisconsin has successfully assigned each public school student a unique statewide ID, and has begun collecting individual student record level data through our ISES (Individual Student Enrollment System). Ongoing plans include expanding the ISES framework to collect additional information at the student record level, and integrating student-level data with existing aggregate-level data. Through our assessment vendor (CTB McGraw-Hill), encrypted student identification will become the basis for test tracking.

(2) Enterprise-wide data architecture (High area of need). The most pressing need for DPI is to establish an enterprise-wide data architecture for educational data. The stove-pipes of DPI are rich, but are constructed differently, for different purposes, and are informationally independent. While we have common school and district identifiers and similar understandings across functional areas, there is no common data model, common data dictionary, or set of documented business rules[7].

(3) Procedures for protecting security, confidentiality, and data integrity (Moderate/high area of need). Statewide student data is extremely secure, and DPI has relatively stringent policies with regard to the confidentiality of student data. However, the need to share student

[7] See CELT Corporation (http://www.celtcorp.com) or eScholar (http://www.escholar.com) for examples of commercial-quality School Interoperability Framework vendors already working in this space whose success could be leveraged.

data in the agency will require a fresh look at student-level data security, the requirements of the Family Educational Rights and Privacy Act (FERPA), and appropriate and state legal use of student data. This is a serious challenge that can be a barrier to sharing data if not handled correctly. If DPI is to evolve into an information clearinghouse, new demands will become evident in the area of security, confidentiality, and data sharing. Existing security frameworks will need to be revised to meet these new demands[8].

(4) Vertical integration of local and state data collections (High area of need). As data use for decision making becomes more sophisticated—both locally and at the state level—the need for sharing information will only grow more pressing. Program areas and DPI's Information Technology Team have worked together well to streamline data collection as much as possible. Even so, NCLB and other national- and state-level efforts have driven an expansion of demand for new data that puts the agency continually behind the curve. These new initiatives require DPI to bring together disparate state resources to help encourage technology efforts around the state, and create a standardized environment to support analysis and decision making.

(5) A data warehouse for longitudinally linked data (Moderate area of need). A data warehouse is a natural outgrowth of system integration, and currently no such warehouse exists across the state. While DPI is making solid progress on student identifiers, has purchased an enterprise-wide RDBMS, and has migrated its new development data to Oracle, it still has a long way to go. The need for enterprise-wide architecture and the need to integrate data resources across departments remain important, yet daunting hurdles.

The partnership states of Michigan, Minnesota, and Wisconsin will share responsibility for all 5 program areas. However, Wisconsin must focus special attention on the area of data architecture (2) and vertical integration (4) for any effort to be ultimately successful. While all of the system components must work together, these two issues (2 and 4) will require the most attention and will be central to Wisconsin's success.

Project Partners and Group Design Plan

As states struggle to meet the challenges of developing useful decision support tools, they all face similar obstacles. They must address state policy constraints, technical obstacles, and diverse user needs. The work of this project will be enhanced through a multi-state partnership among the Michigan Department of Education (MDE), Michigan's Center for Educational Performance and Information (CEPI), the Minnesota Department of Education (MDE) and the Wisconsin Department of Public Instruction (DPI). This partnership will foster the design of common solutions, leverage resources, and increase the capacity to exchange data across states in the hopes of creating more powerful and robust research tools. Each state is prepared to take the lead role in different components, sharing design solutions and development requirements with partner states to accelerate the implementation process for all.

This multi-state partnership will also include the WCER in the School of Education at the University of Wisconsin in Madison. WCER will assist in identifying best practices in data use policies, researcher and educator user requirements, and decision support needs in order to optimize the architectural design of the emerging data portals, warehouses, and linked data sets in each of the partner states. WCER will also take the lead in facilitating effective collaboration across states, including the development and implementation of a plan for national dissemination of design documents and results. This plan includes the development of a project web site, presentation at NCES, CCSSO, and other education policy groups, and through scholarly conferences. We also plan to propose a working conference in association with one of the

[8] "Protecting Student Privacy in Wisconsin" (http://www.dpi.state.wi.us/dltcl/lbstat/dataprivacy.html)

work on analysis and implementation.[11] Partner SEAs will work with WCER to identify appropriate stakeholders to participate in focus groups and/or surveys. Surveys of school improvement planning documents and other tools designed to help support data use will provide additional insights into the data needs of key processes in system reform efforts.

Data collected for reporting purposes are, by definition, historical in nature. The focus is always on "how did we do?" and the data are analyzed with accountability in mind. In contrast, decision support systems are designed with evaluative components in mind, and can support a forward-looking approach. Therefore, the granularity and frequency of the information feedback should match the level and purposes of its use. For the improvement of instructional practices, fine-grained and frequent information, including feedback on instructional practice tied to learning, is needed. At higher levels of the system, more aggregate and less frequent information feedback provides a sufficient basis for allocating resources, and for evaluating and refining policies.

Data systems should permit connections across a variety of educational data to foster access to and reflection on information relevant to teaching and learning. Reports and user training must be designed with particular attention to developing the knowledge base necessary for valid interpretation of the information so generated. [12]

As states begin to modernize data structures and improve publishing capacity, they will provide unprecedented access to robust state level data sets. Professional development must be careful crafted and provided in context to support appropriate use of these new tools. Likewise, reports must be designed for the purposes of improving the understanding of educational issues, supporting the monitoring and improvement of teaching and learning, and increasing capacity to select effective teaching strategies.

Since value-added and longitudinal data analysis will be an important end-use application, Appendix B summarizes important features of these models and the connections between these models and the structure of a longitudinal data warehouse.

User Roles

If developed correctly, data portals can provide effective decision support tools for a range of users, including university level researchers, educators and parents. WCER will assist states in gathering and defining requirements to ensure that the needs of each user group are clearly identified and incorporated into the design specifications. It is our intention to include trained researchers, state staff, school board members, administrators, teachers, and parents in focus groups to better understand and define clear needs for a range of end users.

Once the full set of user roles is identified, the portal can be designed to allow appropriate access rights. This will ensure that confidential information stays secure, yet will permit researchers to aggregate information as required. Standard roles such as parent, teacher, school or district administrator, researcher with accredited organization, etc. will be included in the data model, and the research will inform how to combine available data for various groups.

Data Access

In the past, software applications stored role access information directly in application code. For example, deciding which user groups could access what information was embedded

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[11] Both the Value Added Network and System Wide Change for All Learners and Educators (SCALE) at WCER are working with large urban districts to improve decision support efforts and identify successful interventions.

[12] O'Day, Jennifer (2002). Complexity, Accountability and School Improvement. Harvard Education Review

directly in Java or Visual Basic code. Making changes to these role access statements required expensive programming modification and retesting.

With the new generation of Model Driven Architecture (MDA) software, complex role-based access policies can now be stored directly in the data model with the metadata. Applications read these role-driven statements and allow appropriate access to specific data elements. Access permissions can also be changed by adjusting metadata without rewriting custom programming logic.

The tri-state group plans to develop metadata structures that store access roles directly in our data dictionary for policies that are common across our organizations. These would reflect written documents that are approved by data access policy review teams with each of our states. For example, roles might permit a school principal to access average test scores for all states, but only for individual student scores within his or her school.

Other access statements may allow individual states to customize options based on state statutes or even individual district-level policy. One example of this might be the minimum cell size for scores for a given sub-group. Another user role might allow classroom teachers full viewing rights to their student's prior year strand-level test scores even if those students came from outside of the district. These decisions might vary from state-to-state and even district-to-district. Determining the data access options for specific user groups will be a key feature of our initial focus groups.

Broad-based access to robust data sets can increase the likelihood that untrained users will use data to identify inappropriate causal relationships, or will combine data elements inappropriately. WCER will assist states in identifying appropriate statistical information to be provided for various user groups that supports best practices in school improvement solutions. The goal of the project is to design and implement data systems that will help users gain ability to focus on what is most appropriate for improving teaching and learning.

Evaluation Criteria

To ensure that data continue to evolve with changing policies in the areas of teaching and learning, testing and assessment, and school improvement, WCER will assist states in developing evaluation criteria that can be used to collect feedback from users and researchers through e-surveys incorporated into each state's portal. This feedback will be incorporated in annual updates to data collections and displays to ensure that the data portal continues to meet the needs of its users.

Wisconsin Notes

The content and architecture of the system will be designed to allow Wisconsin to monitor the value added by its district, schools, and classrooms to student learning. Value-added analysis will improve local capacity to identify programs and policies that are successful in improving student achievement. The warehouse design will also enhance the timeliness and accuracy of reporting, provide improved ability to engage in data analysis, and support a more robust approach to decision support.

DPI's Office of Educational Accountability (OEA) will play a key role by acting as liaison between program areas across the agency. OEA is currently engaged in surveying all data resources across program areas. This knowledge will be vital as DPI moves to address the data needs of these programs as a part of the design process. In addition, other formal structures such as the State Superintendent's Educational Data Advisory Committee (SSEDAC) and the Internal Data Committee can serve as valuable avenues for communication and governance.

II. Project Design: Data Policies

Effective management of comprehensive data sets requires individuals in each state department who will act as conduits between the technology staff, and build and maintain the collection and reporting systems. Also required are the program area staff who are charged with administering the policies that govern the data collection and reporting. This project seeks to develop a process that can be used across the partner states for identifying effective data stewardship practices.[13]

Data Stewardship

Enterprise-level data management requires specific organizational support to ensure that metadata models and definitions are administered efficiently, and data collection and analysis continues to evolve in response to user needs and policies. Executive sponsors, business process owners and data stewards are critical players in the process. In most state agencies the executive sponsors have the authority to enforce compliance with the various data collections. For example, in Minnesota, the Assistant Commissioner of Accountability is the executive sponsor of the NCLB data collection and reporting efforts. Business process owners are charged with implementing the policies as defined by the agency's executive team. Data stewards are responsible for defining the metadata structures. These three roles comprise the data stewardship team and oversee the work with specific data sets to ensure that standard documentation processes are maintained, data domain values are defined, data quality rules are validated, and exceptions are resolved.

Confidentiality

All data systems designed in conjunction with this project will be aligned to state and federal data practices requirements, including FERPA. The data dictionary and the data security framework will address data confidentiality. First, the data dictionary will include a metadata tag for each element indicating the level of confidentiality. These tags will govern filtering and access across user roles. For example, student-level data will be filtered to suppress identifying information, unless specifically permitted by the user role. Some states may elect to pursue the option of allowing parents and students to retrieve student data from their warehouse. In such a system, parents would be permitted to see their child's and only their child's information. Researchers, on the other hand, might be able to aggregate all of the student information they require, and but may not be allowed to review individual student identifiers.

Second, the data portal will include a role-based security system requiring user authentication. The enterprise-level authentication process will allow districts to manage access to specific accounts for parents and staff. Other user roles will be managed at the state level.

User Training

Once the user groups have been identified and the data needs articulated, work can begin on the design of streamlined reports to be accessed through the portal. User guides and tutorials designed from the functional specifications of each state's system will be available through Web-ex sessions. Specific tutorials will be designed for each user role to accommodate the range of stakeholders intended to access the system.

In Michigan, CEPI has successfully developed a training model based on a partnership with education associations such as the 57 intermediate school districts (ISDs), and the Michigan Institute for Educational Management (MIEM), that trains district staff members (from support personnel to superintendent) and others targeted to specific roles. This partnership uses a "train

[13] Data Confidentiality Guide of the National Forum on Education. Forum Guide to Protecting the Privacy of Student Information: State and Local Education Agencies, 2004.

the trainer" approach to delivering face-to-face and online training, with CEPI developing the user support materials, and the associations leveraging their expertise in professional development and training.

For the work proposed in this grant, CEPI proposes to work with Minnesota and Wisconsin to develop approaches to user training for the products of the partnership. All three states can leverage the process knowledge that Michigan has gained to provide meaningful training that will scale within each state's unique professional development infrastructure. Our states will use the National Forum on Educational Statistics "Guide to Building a Culture of Quality Data," as a framework to create professional development materials targeted toward school and district personnel who are responsible for providing high quality data.[14] With the completion of the warehousing and reporting infrastructure, new users will need data wizards and case-based approaches to successfully complete the activities required for data collection and the use of educational reports and data for ad hoc queries. CEPI proposes to work with Minnesota and Wisconsin to develop approaches to user training for the products of this partnership. All three states can leverage the process knowledge that Michigan has gained to provide meaningful training that will scale within each state's unique professional development infrastructure.

Wisconsin Notes

In assuring data confidentiality, Wisconsin has routinely exceeded requirements of state and federal law. Confidentiality has been a keystone for DPI's Strategic Information Technology Plan and continues to be a top agency concern.

III. Project Design: Data Dictionary

Once the data elements and user roles have been defined, the dictionary will become the cornerstone for the organization and maintenance of flexible data structures. Each of the partner states collects large amounts of educational data, but definitions can be unclear or not systematically updated to reflect the most current policies, and in turn can render the data less valid for decision support. Currently there are only a handful of staff members with highly specialized skills who understand the complexity of existing differences in definitions and the complex relationship between the data from different program areas. This project seeks to facilitate the development of a shared data dictionary for use in cross-state longitudinal data analysis.

The data dictionary will be built and maintained by each state's staff but will be displayed on a shared public website accessible to users of each state's data warehouse. The dictionary will include formal web-based check-in and check-out procedures and version control systems at the data element level. Each state will maintain a database of the time ranges for retention of specific data elements. For example, LEP classifications of students will have date ranges that are specific to each state's policies.

The data dictionary will conform to requirements for metadata at the federal and state levels. Tools to develop both schema and sub-schema will be integrated into the environment, and regression analysis tools will be configured to test the data dictionary for consistency and completeness. As part of the design process, all current data elements and structures in each state will be catalogued and defined for inclusion in each state's dictionary and warehouse. Specific design components are outlined in the following sections.

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[14] National Forum on Education Statistics. (2004). Forum Guide to Building a Culture of Quality Data: A School and District Resource. (NFES 2005-801). U.S. Department of Education, Washington, DC: National Center for Education Statistics.

Student Data

High quality educational research depends on a student data system that can provide both aggregate and individual-level data based on a variety of elements, including student demographics, test information and disciplinary information. The categories below illustrate the data sets that will be included in each state's warehouse.

PK-20 Student-level data:	Student identifier, student demographic characteristics, grade level and home school, program completion and certifications, special program participation (special education, limited English proficient, etc.) dates enrolled (if mobile student), student test scores, attendance, and discipline.
Data associated with student assessments:	Scale: development scale, proficiency rating, raw score, percentile, normal curve equivalent, item score. Content grain size: subject, strand or topic, item. Standard error of measurement, testing date, and test form.

Staff Data

This project seeks to expand the data resources in each state by developing teacher identifiers that can be used to link teachers to specific students, and to provide further information about classroom and school experiences for clusters of students. WCER will take the lead in researching policy issues, and in assisting states to conduct focus groups to determine which of these new data elements should be included in the design of the warehouse. Specific data elements might include staff identifiers, course titles and descriptions, teacher certification information, etc. The inclusion of these new data could also make it possible for teacher colleges to potentially track the performance of recent graduates.

School and District Data

While student outcomes are the primary focus of educational accountability systems, this data must also be associated with schools and districts. Adding school and district identifiers to the data warehouse will allow important program-level aggregations of the student data sets.

School-level data	School identifier, school features and programs, and school-wide professional development.
District-level data	District identifier, district features and programs.
Finance data	State aid, accounts/account groups, property text rates/equalizing housing values.

Linking Data Sets

Each of the partner states is at various stages of implementation with regard to student identifiers. While Minnesota has been assigning unique student identifiers at the district level for over 10 years, there is too much noise in the system to support valid longitudinal analysis. ID numbers are reported by the districts as historical records, and are maintained by the state. The state uses this historical information to produce an ID repository, but it is based on "closed" reported data, which can be as much as 18 months behind the current ID assignments. This lack of real-time validation makes it nearly impossible to have current student-level data available for use by parents or educators. This is of particular concern for mobile or migrant students.

As part of the data warehouse component funded through this project, Minnesota will create a transactional student ID system to provide real-time authentication of student ID

numbers. This improvement will prevent duplication of ID numbers when students transfer by providing a current look-up, to more easily find or assign identification numbers for new students. With valid student IDs, the integrity of the data set will permit the kind of linking necessary to support a variety of value-added analytic models.

Data Portal

The ultimate strategic goal of each state is to design an education portal to facilitate on-demand requests for reports, and to ease the burden of local data submissions. The combined vision includes the development of a series of web services that will provide real time feedback to improve the editing process involved with data submissions, and provide a series of reports and data analysis options for a variety of user groups.

Leading data publication tools in the marketplace include the Cognos Suite of Business Intelligence Tools and Microsoft Business Intelligence Tools. While the partner states plan to explore the purchase of a single business tool to leverage buying power, our warehouse design will be tool-independent. It will not be necessary to purchase the same product across all three states. The partnership will permit states to collaborate during the design and analysis phases, resulting in a more informed purchase decision for all.

Regardless of the business intelligence tool(s) selected, portal designs will permit unique views of the data required by each user group while ensuring that edit and access policies are enforced, and secure data transports are used.

Wisconsin Notes

It is important that the Wisconsin implementation of the data dictionary as discussed above be synchronized with its state partners. Data elements may possibly deviate from the partnership in many respects, but, where deviation exists, there must be sufficient reason and documentation to justify the deviation. Wisconsin has already begun to benefit from Minnesota's work in this area through shared models for data elements, which Wisconsin has begun to pilot.

The DPI's Data Collection Plan itemizes the data currently collected through federal or state requirements. In Wisconsin, data collection activities not based directly on law or regulation must be referred to the SSEDAC for authorization. The Data Collection Plan is the authoritative register of DPI collections. Data collections include student-level information in ISES, assessment information, special education data, student program information (English Language Learners, etc.), and financial/state aid information. Within Wisconsin's data collections, priority will be given to student-level data. ISES, assessment, and special education data currently constitute the only student-level data that are collected statewide.

IV. Project Design: Data Warehouse

In 2006 each of the partner states will for the first time have uniform testing data from grades 3-8 and high school. This will make it possible by 2007 to conduct value-added analysis of student performance on state exams, and link this new test data to additional school and teacher information to research a variety of issues. Even though the data will be available, if significant adjustments are not made to existing state systems, they will not be useable. Each state currently stores its data in legacy systems that do not permit flexible data modeling. This project will support a successful transition to a decision-support system that leverages data stored in these legacy operational systems. The model shown in Figure 2 (in Appendix B) illustrates how a comprehensive data model can be built with the incremental inclusion of existing data sets as time and funding permits.

The partnership requirements analysis team will:

- Leverage the technical expertise of each state's IT department and contractors
- Ensure consistency among states

- Develop a common set of implementation standards
- Use a common dictionary to ensure longitudinal data analysis across states
- Ensure that the design is vendor neutral
- Promote industry standards and best practices

Data Modeling

The success of each state's education data portal is directly linked to the quality of the underlying data model. Collaboration among partner states will facilitate the identification of similar high-level data groupings common to educational systems, and decrease the likelihood that individual states may miss critical components. The warehouse design will be based on metadata models that conform to federal standards, including fact tables and conformed dimensions as described by Kimball. [15]

The mapping scheme will capitalize on commonalities across states, yet permit variation in naming conventions to ensure that local nuances are preserved. By incorporating these nuances at the initial design stage it will be possible to maintain high levels of data integrity without compromising interoperability. The tri-state data model will map to elements defined by NCES and EDEN, and be compatible with School Interoperability Framework (SIF) standards. The model shown in Figure 2 (see Appendix B) also illustrates how existing data will be transformed through platform-independent connections and will reside in a series of data marts created from existing and new data elements.

Wisconsin Notes

A unique student ID is assigned by the DPI and is coordinated statewide through the Office of Educational Accountability. The reauthorized federal Elementary and Secondary Education Act (ESEA) (NCLB) requires extensive additional data collection and reporting by both state and local education agencies. As a result, the DPI and local school districts needed to modify their existing data systems. Beginning in the 2004-05 school year, Wisconsin school districts began collecting student-level data which allow educators to (a) better account for students who move or are highly mobile; (b) more readily exchange student records among school districts; and (c) respond more quickly to areas in need of improvement.

This effort consists of two distinct applications: (1) development of a Wisconsin Student Locator System (WSLS) and (2) annual submittal of individual student's educational status through ISES. In July 2004 districts supplied the DPI with data such as the name, gender, race/ethnicity, and birth date for each student served by the public school district. The DPI assigned each student a number, which will be the student's sole identifier throughout the PK-12 experience. In March 2005 school districts began submitting selected data for each student, including the entry/exit status (transferred, graduated, or dropped out), primary disability, economically disadvantaged status, and English proficiency level. Because the federal government likely will seek additional student data over time and as DPI strives to consolidates existing data collections, ISES is designed to be flexible enough for expansion. ISES collects current-year enrollment and prior-year entry/exit data. The DPI remains committed to expeditious collection of data, so we will not duplicate enrollment, School Performance Report (SPR), or other state-level data collections. For example, with the advent of ISES, dropout and graduation data is no longer collected for SPR.

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[15] The Data Warehouse ETL Toolkit: Practical Techniques for Extracting, Cleaning, Conforming, and Delivering Data. John Wiley & Sons, 2004.

Whereas ISES is new to Wisconsin, nearly all Midwestern states have adopted this type of system; eventually every state will likely implement a similar system. Wisconsin's system is being developed with student confidentiality as its highest priority. Clearly, this effort will challenge local school district and state education department staff and stretch our limited resources in its first year. School district size, data-collection practices, technology capacity, and myriad other factors will determine each district's approach to ISES data collection.

V. Project Design: Secure Data Transport

This project will expand on work done by SIF and other industry standard interoperability procedures. Interoperability between the federal government, states and districts can be accomplished by developing a data model that includes necessary transformations required by a variety of entities. These transformations will be automated so that information can be supplied securely, quickly, and accurately across systems. Figure 3 (in Appendix B) illustrates how that transport would operate under a typical environment of state standards and accommodating local options—the parallel data warehouse structure.

Notably, this plan represents an approach to statewide data standards that is the least disruptive to local activity and choice. Districts and schools may continue with current arrangements in all other respects and may choose a communication arrangement that best helps them meet state/federal requirements and submission deadlines.

Currently, each state collects data in a variety of ways, from a variety of organizations, including districts, charter schools and data management companies. They are collected and transported at different times throughout the year using a variety of different methods. Some of the data are uploaded via a website, some are submitted through e-mail, and some are entered directly into the mainframe. Each of the various collection systems requires submissions in different kinds of fixed or formatted files. The only "transactions" that occur are data corrections done on the user side that are subsequently batch loaded into the mainframe system. They tend to be confusing procedures for users, expensive to maintain, and prone to error due to the variability of requirements and the lack of real-time feedback across submissions.

Open Architecture Platform

To address the need for vertical integration of data collections, each state will begin the design and implementation of enterprise-level service-oriented architecture (SOA) The SOA will be designed around a single set of standards and will permit users to submit data through the portal. Rather than requiring users to build a series of export capabilities into their software for each of the current "state systems," the new SOA will only require interaction with a single interface. This system will accommodate either batch-oriented or transactional formats.

The SOA will include editing capabilities with a guaranteed delivery system to ensure that data are submitted error-free. Allowing districts to submit data through a single web portal that can accommodate a range of data preparation methods will dramatically reduce data management costs for districts, and will provide access to reports in near-real time.

Secure transport will ensure that data sent can only be seen by the intended recipient. This will involve several technologies that can be purchased from vendors through this project, including XML security appliances and Web Services Security. These tools will be integrated into the architecture of the warehouse and will ensure confidentiality of data across the variety of users. Figure 3 (Appendix B) shows how schools and districts will be able to send data to the state for inclusion in the warehouse, as well as access transformed data through the portal.

Open Architecture Platform and Vendor Support

The added benefit of Model-Driven and Open Architecture is the ease with which new applications may be developed and new software may be conformed to fit the tri-state structure

(see Figure 4 in Appendix B). Sometimes these applications are built in-house, but more often than not, they are developed by outside vendors. Software vendors and other technology firms have expressed their support for projects of this type.

Data Collection

Data collection is a crucial piece of data transport as outlined in this section, and will be a focal point of Michigan's leadership. Michigan has been collecting data from local education agencies for years using the first-generation Single Record Student Database (SRSD) and the Unique Identification Code (UIC). This Longitudinal Data Systems grant will enable the state to redesign the student UIC system to integrate with all student source systems and to become flexible enough to synchronize with multiple federal and state reporting requirements. Solving this alignment problem will virtually eliminate the duplicative reporting that currently costs districts significant time and resources. Designing the SRSD/UIC in a modular and extensible framework will enable Michigan to connect data sets from a variety of source systems and link the data across time, as well as share common modules with other states.

In Fall 2004, Michigan began integrating the UIC with state assessment source systems through a process that proved effective for one test cycle, but which remains labor-intensive at both the state and local levels for data entry, cleansing and tracking. We propose a system re-design that will enable data cleansing and validation before data is submitted to the state and which will facilitate tracking of students across assessment cycles and throughout participation in programs and services. In addition to allowing district staff members to collect data and maintain and correct student core demographics, this integrated system based on the UIC will allow teachers to drill down to the student level to view a student's scores on previous and current state assessments, as well as images of constructed responses. Michigan's early investment in the SRSD/UIC system and associated student data source systems will enable other states to accelerate their student tracking implementations for longitudinal data management.

Wisconsin Notes

Wisconsin's goal is to develop a comprehensive decision-support system based on the vertical integration of data across many systems. The idea of a central store of all data in Wisconsin is currently unrealistic and costly. In order to take state leadership, DPI must be the hub of a federated system of data collection and distribution, taking advantage of the expertise and resources at the district, CESA, and state level where it exists, and expanding data collections based upon where data is most needed and valued.

Project Personnel

DPI Personnel

Wisconsin DPI's information technology, state leadership, research, and program staff will all contribute in important ways to the success of this proposal. This grant will be used to augment the capabilities of existing DPI staff to develop a full-service longitudinal data system. Existing DPI personnel, particularly from Information Technology and the Office of Educational Accountability, will be assigned to work on and/or manage parts of this project. In the personnel descriptions below we indicate DPI management and staff that will have primary responsibility to this project even though their salaries are covered by existing state funds.

Additional personnel funding provided by this project will be crucial to the success of this project, and will be used to hire additional staff. Appendix B, Table 2 contains information about additional DPI staff who are available to work on this project.

Brian Wilmot is Chief Information Officer at DPI. He oversees a staff of information technology personnel who provide services to the agency's 500+ staff. He has directed the assignment of unique identification numbers to each of Wisconsin's nearly 900,000 PK-12

students through the Individual Student Enrollment System (ISES), and has established plans for the overall business functioning of the agency. Wilmot represents DPI at the federal level with the National Center for Education Statistics, and chairs and participates in various advisory groups at the state level and throughout Wisconsin. Prior to joining DPI, Wilmot served as Chief of the E-Business Section and Chief of Computer Services for the Wisconsin Department of Natural Resources, and held management positions in the Computing Division of the University of Wisconsin-Milwaukee.

Phillip Koenig is Technical Services Supervisor at DPI. He is supports all hardware and software infrastructure services for the agency. Technical Services coordinates and manages all system access and authentication, web availability and network services. Phil was part of the infrastructure design and implementation team for the University of Wisconsin's migration to a new student information system, the University of Wisconsin System's 17 campus financial system implementation and was a middleware and authentication project manager for the University campus web portal and enterprise directory.

Tiffany Boyd is Applications Development Team Supervisor at DPI. She oversees all of the data collections for Wisconsin's 426 school districts and more than 2300 schools that are coordinated through the agency for federal and state reporting purposes. She serves as the project manager and technical lead for design and implementation of the Wisconsin Student Locator System (WSLS) and the Individual Student Enrollment System (ISES). Boyd previously served as IS System Development Services Specialist at DPI, and worked in the private sector as a Web Application Developer.

Bradley Carl is Consultant for Statistics, Assessment, and Accountability in the Office of Educational Accountability (OEA) at DPI. He participates in the development, implementation, and reporting of the state's standardized assessment, known as the Wisconsin Knowledge and Concepts Examination (WKCE), as well as the use of WKCE results for accountability purposes as specified by the No Child Left Behind Act. He also oversees many of the research and outreach initiatives conducted by OEA, including the development of a web-based reporting system for assessment results and the incorporation of value-added models into Wisconsin's accountability plan.

Par Jason Engle is Education Consultant for Standards-Based Assessment at DPI. He works extensively in both statistical analysis and database/applications design. He has four years experience in the educational data space from data warehousing efforts in the Madison (WI) Metropolitan School District.

Wisconsin Center for Education Research (WCER) Personnel

Dr. Robert H. Meyer (Principal Investigator) is director of the newly-established Value Added Research Center at WCER. Before joining WCER, Meyer was on the faculty of the University of Chicago (Harris School of Public Policy Studies) and the University of Wisconsin (Economics Department). Meyer is known for his research on value-added modeling and evaluation methods. Over the last decade and a half, Meyer has worked closely with districts and states to develop and apply innovative statistical methods. He has conducted major statistical evaluations of programs and policies such as SAGE (the Wisconsin class-size initiative), systemic reform in Texas, integrated versus traditional mathematics, and professional development and other math and science reforms. At the other end of the evaluation spectrum, Meyer has worked with numerous districts, including Minneapolis and Milwaukee, to develop and implement value-added indicator and accountability systems. He has led several AERA pre-sessions on value-added indicators. Meyer will coordinate collaborative cross-state research, oversee research on end-use data applications, and direct research activities conducted at WCER. Meyer will allocate 40% of his time to this project (split across the three participating states). His

remaining time will be devoted to related research projects: developing and implementing the next generation of value-added models and indicators with district partners Milwaukee, Minneapolis, and Cleveland (funded by IES and the Joyce Foundation) and evaluating the Wisconsin SAGE program (a 12-year study funded by the Wisconsin Department of Public Instruction).

Dr. Chris Thorn is director of Technical Services at WCER. Thorn has been actively engaged in both large-scale program evaluation work, as well as mixed methods analysis of school- and district-level decision-making for the past 15 years. Thorn managed the Spencer-funded evaluation of the Milwaukee Public Schools Voucher Program for 5 years and a state-wide evaluation of school-to-work programs that included a mixed-methods analysis of participation, and a study of workplace and higher education outcomes. He has worked extensively with state-wide student data and with data sets from large districts, including Los Angeles. At the district and school level, Thorn has developed and implemented data-based decision-making and decision-support tools and provided related professional development. Thorn's recent scholarly writing has focused on the characteristics of successful decision-support systems in schools and districts. Thorn will coordinate collaborative cross-state research on information technology and decision-support tools. Thorn will devote 30% of his time to this project. The remainder of his time will be devoted to related research: building a data warehouse and indicator system for Los Angeles and other districts participating in WCER research projects and directing technical services to support research at WCER.

The remaining WCER personnel are grouped into three teams: management; information technology and statistical computing; and research and applications. The following senior faculty will be available as project consultants: Dr. Douglas Bates, Professor in the Statistics Department, is an expert in statistical computing with large data sets, and is a core contributor to the R language for statistical computing and graphics. Dr. Julie K, Underwood, newly appointed Dean of the Education School, is a lawyer and expert on school law. Currently, Underwood is the Associate Executive Director and General Counsel of the National School Boards Association. Dr. Adam Gamoran, Director of WCER and Professor of Sociology, is a member of the National Academy of Education (NAE). Gamoran is widely recognized for his statistical analyses of educational inequality, particularly his studies of grouping and tracking in elementary and secondary schools. He has published numerous articles analyzing achievement growth in national, state, and school district data sets. He has extensive experience with multilevel modeling, and teaches a graduate seminar on multilevel models of school effects. To economize on space, the remaining WCER faculty, IT staff, and research staff who are available to work on this project are listed in Appendix B, Table 3.

Resources

One of the distinctive aspects of our project is that it is a collaborative venture among three states and the Wisconsin Center for Education Research. We estimate that working together will permit each state to share responsibility for at least fifty percent of all project tasks, thereby more than doubling the impact of the resources allocated to each state.

DPI Resources

The Wisconsin Department of Public Instruction (DPI) is the state agency presiding over 426 school districts, over 2,000 schools, and in excess of 880,000 students. It serves as the key conduit for educational support and service statewide. DPI is the source and allocation division for over 60 percent of state education spending, ensuring that state aid is equitable, efficient, appropriate, and within state legislative and fiscal goals. DPI administers grant programs to augment funding for districts and schools with special needs and supplemental initiatives, both through state and federal funding. The role of DPI in solving communication and information-

sharing problems in state, local, and federal education systems is to encourage and facilitate the design and implementation of enterprise-wide technology solutions. The DPI emphasis has not been to mandate technology design, but rather to offer options, planning, and support from a statewide perspective, so that districts may make the choices best for them. In light of this mission, DPI realizes that statewide leadership and coordination is critical to the development of efficient and effective education information systems within an enterprise framework: a defined set of principles, standards, and policies for education integration.

Project Support

Support for this vision is not only evident at the agency level, but across the state. Attached to this document (in Appendix B) are letters of support. These letters represent the diverse districts of Wisconsin (rural and urban), the regional administrative agencies (CESAs), and wider government networks that influence state education and information technology policies. They have been informed of our project plan and are aware of the potential for interstate cooperation. Nowhere is support more evident than through the state superintendent's vision of the New Wisconsin Promise. A task force of DPI employees currently is involved in a year-long process, the goal of which is to coordinate the work of the agency around the strategic priorities outlined above. The task force is working to assess and align current departmental activity with administration operations and key strategic priorities, to discover natural and/or possible collaborations across all DPI divisions, and to create goals and action plans for each strategic priority.

Wisconsin is a local control state, and DPI is traditionally reluctant to interfere with district autonomy without compelling reason to do so. The rationale for this has been the philosophy that teaching and learning decisions are best made closest to where the teaching and learning occurs. Districts and schools are very different from one another across the state. For this reason, they are allowed to operate in an environment that enables them to creatively use resources to meet challenging and often differing local needs; the state's role is to facilitate the use of resources. Excessive regulation can be an impediment to this process. Increasingly and with some irony, Wisconsin has realized that in order to best help districts make their own decisions; to help districts fulfill data requirements efficiently, and to help distribute the financial, resource, and organizational burden of its increasing information management responsibilities, it must take a leading role in state education data.

The DPI is housed in General Executive Facility III (GEF III). For technical infrastructure, DPI networks computers for over 600 full-time employees in the GEF building and other locations, under guidance, and with support of the Wisconsin Department of Administration (DOA), included as a sponsor of this application.

To accommodate a longitudinal data systems project, we anticipate an increase in development staff and other resources needed for the three-year period, distributed between WCER and DPI. Together, the two organizations have over 80 professionals associated with Information Technology. DPI operates an Internet web presence and an intranet presence through the DOA, and has rapidly expanded its data management and application development capabilities since 2000. DPI is currently running several test and production database servers on site, and has instituted formal application development and security procedures.

Funding

Data projects are funded and will continue to be funded with money allocated internally to the Information Technology area. Additionally, a planning grant issued by the US DOE currently supports exploratory groundwork for a DPI data warehouse. While the architecture aims to minimize additional funding requirements on an ongoing basis, the CELT study makes

clear that DPI is underinvested in technology for the role it needs to play in the coming decade. To fill this role, DPI plans to add sources of funding—both internal and external—to sustain the systems that are designed in this application after grant expiration, and to provide means for applying the design toward useful program-area applications that will have value across the agency. Shifting assignments and architecture will undoubtedly have negative immediate fiscal impacts, both on development and on organizational adjustment to new roles and responsibilities. We are not naïve enough to expect our project to be the exception to this rule, but we have learned from successful government applications in enterprise data that investment does pay off. Given the great degree of interest surrounding implementation, we are optimistic about external and partnership funding prospects. While it is unclear how much savings are possible by integrating state data activity at a high level, there is no question that these savings would be substantial.

WCER Resources

The **Wisconsin Center for Education Research** is one of the nation's oldest and most highly esteemed university-based education research and development centers. A part of the University of Wisconsin–Madison's School of Education, WCER provides a productive environment where some of the country's leading scholars conduct research. WCER research spans the full scope of education, from the effects of infant child care and after-school programs to undergraduate and graduate curriculum reform. With annual extramural funding exceeding $22 million, WCER is home to centers for research on the improvement of mathematics and science education from kindergarten through postsecondary levels, implementation of reading and behavior intervention models for K-3 students, and education policy, as well as a comprehensive regional assistance center that supports schools and agencies in meeting the needs of schoolchildren throughout the Midwest, with priority given to high-poverty schools and districts. A commitment to disseminating research findings and research-based educational interventions and products has characterized WCER from its inception.

WCER's work on this project will be the responsibility of the **Value-Added Research Center** (VARC), the newest and fastest growing research center in WCER, and the Technical Services Department at WCER. The mission of VARC is to promote the development, application, and dissemination of value-added and longitudinal research methods to evaluate the performance and effectiveness of schools, teachers, programs, and policies; facilitate the use of value-added performance indicators to monitor the performance of schools and hold them accountable for their performance; and support data-driven decision-making at all levels of the educational system. VARC is currently working with numerous districts, states, and universities, including Minneapolis, Milwaukee, Cleveland, Los Angeles, and the states in the tri-state partnership. The Center is also doing basic research on the statistical foundations of value-added and longitudinal research methods. VARC's work is currently funded by the Wisconsin Department of Public Instruction (a twelve year study of the SAGE program), the Institute of Education Sciences, the Joyce Foundation, Milwaukee Public Schools, the National Commission on Teaching and America's Future, and the National Science Foundation.

The **WCER Technical Services Department** provides multimedia services, custom software development, and computer support for more than 350 networked computer systems. Advanced database services have taken on an increasingly important role within WCER Technical Services. Technical Services is currently supporting data warehouse ETL and analytics on an active-active cluster of two dual-processor 3.6 Ghz Xeon servers with 8GB RAM. These servers are each running Enterprise MS-SQL 2000 on Windows 2003 Advanced Server. The servers are connected through redundant paths to a dedicated EMC CX300 Storage Area Network (SAN). Both the cluster and SAN allow considerable expansion through additional nodes.

More importantly, Technical Services has also reallocated staffing to better support the advanced needs of data-intensive research projects housed at the Center. We currently have two full time database application developers, an ETL expert, and a data system architect on the staff. This team has experience designing research systems as well as working with research and information system staff at large districts as they coordinate with project research teams to support the analysis of complex longitudinal data.

The WCER Technical Services also supports the use of a number of different collaborative technologies, including large-scale, toll-free teleconferencing, point-to-point video conferencing and web-based desktop sharing tools. However, the most significant contribution that WCER makes to collaboration over distance is its expertise in web-based collaboration tools.

WCER has deployed an enterprise-level web-based collaboration environment called SCALEnet to support distributed work across complex partnerships. SCALEnet's ability to support complex work processes and its utility as a knowledge management system facilitates partnership collaboration, data-sharing, and inquiries. Behind the scenes, SCALEnet provides a relational database for tracking and reporting project activities, tracking project outputs, and monitoring status. It offers a web interface that allows remote management of files (including version control and approval processes) as well as coordination of tasks and calendars.

The tri-state partnership's space inside the SCALEnet environment has been named the Longitudinal Data System Community Space (LDSnet for short). This space is explicitly designed to foster the development of communities of practice across the partnership. In addition, several communities within SCALEnet have considerable overlapping interests with the tri-state partnership. One large NSF-funded project is working on longitudinal analysis of student and teacher data in the Los Angeles Unified School District. We are already discussing avenues for sharing best practices and technology assessments between groups. The SCALEnet infrastructure makes such sharing easy. Indeed, the proposal preparation process was greatly aided by the availability of a secure, flexible, collaborative environment that could be shared by all partners.

The UW-Madison **School of Education** is consistently ranked one of the top schools of education in the country. *U.S. News & World Report,* in the 2006 edition of its guide to the best graduate schools of education, ranked the UW-Madison School of Education ninth in the nation; in the specialty rankings, the School of Education came in first in curriculum/instruction; second in educational psychology, elementary education, and secondary education; and third in education policy and education administration. The **University of Wisconsin–Madison** is recognized throughout the world as one of the great U.S. universities. Its academic reputation has been rated among the top 10 in the country in many areas of study since the beginning of the last century. *U.S. News & World Report* currently ranks UW-Madison seventh among U.S. public universities.

Management Plan

Management of project planning and work activities within and across the three collaborating states and WCER is obviously a crucial part of this project. WCER will be responsible for managing cross-state activities. As discussed in the previous section, the Partnership will use (and has already made effective use of) LDSnet/SCALEnet, a powerful web collaboration tool for exchanging work products and managing the work activities over time. The state project directors and the WCER principal investigator will manage work activities within each of their respective organizations and serve as the steering group for the entire project. As is explained below, the project has been divided up into distinct task areas: data analysis and research requirements, data access, data dictionary, data warehouse, and secure data transport.

Each of these task areas has been further divided into subtask areas. As indicated in Appendix A, each state and WCER has been assigned a specific level of responsibility for each subtask: (1) primary responsibility, (2) secondary responsibility, or (3) review and implementation. Separate management committees will be created for each task area and will be staffed by key personnel from each organization. The project steering committee will interact with the task management committees to ensure that the task work is being completed in a timely and high quality manner and to ensure that the work of the different task groups is coordinated. One of the major strengths of the proposed project is that the design of the data warehouse and data dictionary will be driven by the end-use needs of educational stakeholders. As a result, coordinating the work of the task groups will be an important priority.

The tri-state plan has several distinct positive features. In addition to the operational synergies and standardization that is the cornerstone of shared overall design, we are designing the project timelines to proceed in discrete increments to avoid the systems version of "analysis paralysis"—taking on too much design without implementation. Small successes will ensure that investment in a particular area is captured and used and that blueprints for a grand system do not languish on the shelf. For more detail, refer to the collaborative task list and the companion timeline to this application in Appendix A. Incremental inclusion of more data collections and more stakeholders into the designed system will aid in supporting modular development. A requirement that this grant stipulates, and that all three states must live by in an era of tighter state budgets, is to make the maximum use of resources by managing projects to plateaus—intermediate goals that are standalone improvements such that if no more support were given, the improvement would persist. Likewise, these functions also must be as independent and self-contained as possible.

How Do We Get From Here To There? State Cases

The following cases serve as examples of areas of state leadership in the proposed grant. They serve as indications of strength in each state, and commitment to participation in the project. During the grant process, we have successfully networked many areas and have begun to identify areas of strength, shore up areas of weakness, and have been able to help each other become more focused. This grant is a testament to the abilities of these three states and the trust built during this process. Here are some cases to illustrate how the tri-state partnership will use their network *to get from here to there.*

Wisconsin

An important goal of a longitudinal data system is to provide information that is instructionally relevant. The decision support challenge at the classroom level is the ability to deliver relevant data to teachers in a timely fashion. Unlike many indirect benefits of a data warehouse, delivery of data to teachers represents the closest link to student achievement that this project offers. While the member states recognize the sensitivity of collecting teacher information, in order to have the most profound impact on student learning, teachers and students must be connected at the individual level. Without this connection and ability to have student information pass from teacher to teacher, information gets lost. With a comprehensive system, teachers will have the opportunity to be assigned students, prepare in advance for their incoming classes, and upload/download rosters to use for classroom management with all integrated DPI information about their students at their disposal.

Student transcripts are another challenging area in which DPI is taking the lead. Establishing a transcript requires gathering classroom level information. Wisconsin will be updating its existing teacher licensing system and has the opportunity to reassesses its collection of staff data. By assigning a staff ID, DPI can create a mechanism to give teachers access to

student data, in conjunction with the architecture developed under this grant. This reassessment will coincide with plans for integrating staff data with student information including, (a) the design of data elements, (b) role-based security, and (c) warehouse inclusion. The project will begin by examining elementary schools, linking teachers and classrooms, and culminate in a pilot project. Concurrently, DPI and WCER will conduct focus groups with the aim of determining teacher needs. This will allow enough time for role-based security to mature to the level needed for the amount and sensitivity of the data required.

Minnesota

The longitudinal data systems being built by each of the partner states will organize and store vast amounts of educational data. Much of these data are currently being collected, but they are stored in stove-pipe legacy systems that do not lend themselves to easy access or flexibility in creating reports. Much work is needed to develop an infrastructure design that will support the creation of robust data models and data marts contained in a data warehouse. Minnesota will take the lead in researching and developing a shared data model for each of the partner states that will drive the development of a collaborative data dictionary and the design of the data warehouse.

As soon as grant activities begin we will research a structure to accommodate a series of data elements that conforms to the federal ISO-11179 guidelines. Special emphasis will be placed on externalized data elements, or data elements that move between systems to adhere to interoperability. Our intention is to correctly identify similar high-level data structures (for example, *activity*, *document*, *student*, *person*, *report*, and *organization*) to permit adherence to national standards while maintaining individualization in order to accommodate nuances specific to each state.

The collaboration of this project will ensure that the data model is robust enough to meet the needs of various user groups, including parents, teachers, educational administrators, and researchers across states.

Michigan

The comprehensive longitudinal data system proposed in this grant will provide key stakeholders with (a) data that are aggregated at the school, district and state level and (b) individual student data at a very granular level. In addition to a new level of aggregated reports that are useful across a state, Michigan will lead the development of an integrated student data system that will provide a dramatically different kind of student data environment from the perspective of key stakeholders. Teachers, administrators and appropriate district personnel will be able to drill down to the student level and both securely enter data and view reports through role-based access.

For data collection, the following examples show how different users will access parts of the system that will help them to achieve their work:

- Pupil accounting and official records personnel can use the online system to either key in or upload student data into a workspace, review aggregated reports of data for uses such as accountability or program participation, and correct data and submit for official snapshot dates that align with reporting deadlines. Official records staff members are the "keepers" of the core student data, including demographics.
- Special education staff members will be able to enter and review program-specific data on participating students and the system will facilitate the maintenance of the core data so that demographics are synchronized with one official version sent to the state.
- Assessment coordinators can enter and review specific data on students to assist in the pre-ID printing of assessments with the UIC, and the system will facilitate the

maintenance of the core data so that demographics are synchronized with one official version sent to the state.

Examples of personnel who need secure access to view student data include:

- Teachers who need to look up new students and see how they performed on previous state assessments by content expectations, so that they don't waste valuable instruction time duplicating assessments while waiting for record and transcript transfers.
- Principals, who can quickly provide students with needed services and use student data for instructional leadership and school improvement activities related to accountability measures.
- Appropriate personnel who manage and maintain student records from student intake through integration into the districts' local student information system integration, thus reducing data entry error at the source.

The proposed system will achieve the four primary components of NCES's "Culture of Quality Data" that include: accuracy, security, utility and timeliness.

Dissemination and Outreach

This project is structured to produce deliverable products, so that the tri-state partnership can work efficiently on different parts of the project plan and share the results of this distributed work with one another, and with other interested parties. As discussed above, the partnership will use (and has already made effective use of) LDSnet/SCALEnet, a powerful web collaboration tool. LDSnet will also be used to make products available to stakeholders within each of the three states, with other state educational agencies, and with researchers and vendors.

Project results, including overview papers that describe the concepts and strategies used in this project, will also be disseminated via conferences and workshops, such as the Large Scale Assessment conference sponsored by CCSSO, the NCES Forums and Management and Data Conferences, the American Educational Research Association and National Council on Measurement in Education Annual Conferences, and other appropriate forums.

The tri-state partnership will also work with stakeholders in the three-state area and elsewhere who are involved in promoting and supporting the development of longitudinal data system capacity, longitudinal research, and data-driven decision-making. As mentioned previously, several districts, including Minneapolis, Milwaukee, Mounds View (Minnesota), and Cleveland are currently working with WCER to develop a self-help network to support value-added analysis and other data-analytic activities. The Partnership expects to make an important contribution to the development of this network among state-level actors.

Conclusion

We believe that a collaborative strategy that draws on the strengths of multiple states and the full spectrum of stakeholders and vendors is the key to developing and implementing a longitudinal data warehouse in a high-quality and timely manner. We appreciate the opportunity to submit a proposal to the Institute of Education Sciences to pursue this strategy and look forward to the possibility of working with IES and other states in this endeavor.

Brian G. Wilmot
(b)(6)
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April, 2004 to Present: Chief Information Officer/Information Technology Director
Department of Public Instruction, State of Wisconsin

Agency Profile: State Education Agency (SEA) serving 880,000 students in 426 school districts and over 2,000 schools, budget of $5.4 billion, approximately 500 staff. Core business processes include Testing and Assessment, Standards and Curriculum, Grant Administration, Data Collection and Reporting, School Finance, Public Libraries

Objective: 'No Child Left Behind' Federal Mandate, multi-year project

- Act as Project Director for the Agency top business priority utilizing a private sector development provider and internal application development staff
- Phase 1: Assign each of the 880,000 K-12 students a unique number through school administrations ensuring rigorous privacy and security
- Phase 2: Establish an Individual Student Enrollment System(ISES) for K-12 student data collection and reporting
- Phase 3: Integrate and streamline all data collection and reporting on the foundation of ISES
- Ultimately integrate data with classroom outcomes to improve education objectives

Objective: Integrate the information technology services into the business of the agency

- Establish the IT Strategic Plan meeting state of Wisconsin enterprise requirements
- Establish IT standards for and direct Applications Development and Technical Services
- Supervise and reorient Applications Development, hire Applications Development Manager
- Initiate an agency-wide project to integrate data collection practices and reporting
- Establish a project management discipline, business IT planning, project intake, tracking and status reporting
- Integrate all of the IT functions

Objective: Establish a plan to integrate IT and the business functions in the agency

- Initiate a study of agency business processes through the Council of Chief State School Officers national organization and identify IT investment opportunities
- Establish a 4 year plan
- Identify sources of staff and financial resources to plan for the implementation
- Recommend management governance for data and IT systems

Objective: Establish customer service relationships and partnerships with external education organizations, service organizations and vendors

- Represent the SEA at the Federal level with the National Center for Educational Statistics, U.S. Department of Education
- Establish and chair cooperative advisory groups
- Establish relationships and partner with school district representatives, Cooperative Education Service Agencies

- Establish relationships and partner with service providers such as CELT Corp, Standard and Poors, Achieve, ISP Solutions and Third Day Solutions

July, 2000 to April, 2004: Chief, E-Business Section
Department of Natural Resources, State of Wisconsin

Objective: Establish customer facing, self service delivery mechanisms to improve service to the citizens of Wisconsin

- Establish strategic plan for Internet based services, linking the IT Strategic Plan with the Agency Business Strategic Plan
- Consult with the service business units to streamline services and reduce hours
- Establish alternative business based governance structures
- Consult with alternate hosting service providers to increase supply chain responsiveness
- Streamline supply chain functions such as licenses and permits to corporate Wisconsin
- Establish a focus for Customer Relationship Management for Internet based services
- Direct WEB support activities to include branding, usability, and meta-tagging of Intranet, Internet and Extranet sites

Objective: Establish a Project Management Office (PMO) for the Information Technology organization

- Assess the state of the organization according to the Project Management Maturity Model
- Prescribe a course of action based on the Project Management Body of Knowledge standards
- Direct a Team of PMI certified professionals to staff and implement standards
- Adjust the organizational culture to reflect team efforts rather than individual silos
- Assess progress of the effort and adjust strategies

October, 1988 to July, 2000: Chief, Computer Services
Department of Natural Resources, State of Wisconsin

Summary: Provide Information Technology services to 3,500 DNR staff throughout the State of Wisconsin

- Provide technical and ongoing support for computer networking services
- Establish strategic planning and the technology architecture for computer networking services
- Direct the technical design of wide area networking, local area networking, corporate Oracle data bases, Internet/Intranet services, Geographic information services, personal computer services, Help Desk, and server technical support
- Direct the technical environment for centrally developed client/server and Internet applications
- Develop cost centers and cost recovery mechanisms for the agency, making presentations to senior management
- Develop long range budget initiatives and short range budget strategies

Significant Accomplishments:

<u>E-Business/E-Government</u>:

- Initiate Government-to-Business process for PC Purchases

- Represent the Agency for E-Procurement activities
- Develop IT Strategic Plan for E-Government
- Establish first E-Business Section in the Agency

Year 2000: Plan and direct preparation of all IT infrastructures for Y2K by June 30, 1999, risk assessment and contingency planning

Service Center Deployment: Develop plans and direct deployment of technology to DNR Service Centers

IT Strategic Planning: Member Core Planning Team

Internet/Intranet Services: Established the Internet, the first in a state agency.

Data Center and Network Services: Developed the design and directed the implementation of Wide Area Networking to 180 locations, Local Area Networking serving 3500 nodes, multiple server operating systems, Help Desk and Personal Computer Support

Budgeting and Cost Recovery System:

- Developed a system of recovering costs for the network and support facilities with commercial accounting software and an in-house designed billing system.
- Developed long range budget initiatives, short-term budget proposals utilizing time payment schedules to spread the costs over the component's life cycle.

Geographic Information Systems (GIS):
Directed the technical support of the GIS servers delivering mapping and standardized spatial data services to the external partners of the Agency and the citizens of the state

General Accounting System: Directed the technical support of the IBM computer, including the operating system, the software product, data communications and operation, which was dedicated to operating a commercial general accounting system for the Agency

Prior to October, 1988: Management Positions in the Computing Divisions
University of Wisconsin-Milwaukee

Summary: Progressed through a series of management positions with increasing responsibilities primarily involving the establishment of mainframe computing facilities, student labs and networks.

Significant Accomplishments:

Administrative Computing: Established IBM mainframe computer systems, operating systems, data communications, and production control functions; supported applications including Registration, Admissions, and Financial Aid.

Academic Computing: Established Academic computer systems, operating system, and data communications; technology labs for students utilizing local area networked personal computer services.

Business Manager: Established and managed systems providing personnel, payroll, accounting and budget services to the computing services department. Designed a billing system for internal and external computing customers

Education: Bachelor of Business Administration University of Wisconsin-Milwaukee
Continuing education courses and national conferences

PHILLIP A. KOENIG

EXPERIENCE SUMMARY

Computer professional with experience in consulting, system analysis, and implementation. Extensive staff and project management experience in small, departmental implementation and large, wide-area, multiple organization initiatives. Team' building and coordination skills for both information, gathering and service implementation efforts. Knowledge of configuration and installation on a broad range of platforms.

WORK EXPERIENCE

Department of Public Instruction Technical Services Section Chief, 2003 - present

Supervisor of the Technical Services section responsible for all network, server, web and workstation infrastructure of the agency. Coordinate and serve as liaison for all IT services with the State of Wisconsin central Enterprise technology division. Member of the Enterprise Directory Working Group reviewing and setting policy for state-wide directory implementation and usage. Manage the efforts of project managers for DPI applications including Wisconsin Student Locator System, Individual Student Enrollment System, agency data warehouse project. Coordinate agency involvement and migration in the State of Wisconsin services consolidation initiative.

University of Wisconsin - Division of Information Technology Network Services Specialist, 1996 - 2003

Consulting, implementation and support services for Madison campus and University of Wisconsin System customers. Extensive experience in project management, infrastructure design, implementation planning and developing support services for large-scale client server application initiatives. Project Manager for Uniform Data System and LDAP Directory Security Review and Enhancement. Member of the infrastructure design team for Madison's Peoplesoft Student Administration installation project. Member of the infrastructure design team for the University of Wisconsin System's Peoplesoft Financials accounting installation project. Project coordinator for client infrastructure deployment for University of Wisconsin-Colleges Peoplesoft Student Administration implementation. Project Manager for all fileserver, client connectivity, processing middleware and end-user client support for all Peoplesoft projects. Implemented applications for 3,200 Madison campus faculty and staff, over 40,000 student users and an additional 2,000 UW-System staff from 13 schools throughout Wisconsin. ,Coordinated all' initial implementation and ongoing client support services. Provided technical support, training for campus helpdesk and local campus support staff. Developed training materials and web sites for end-user client installation and support needs. Designed and supported a custom Peoplesoft client installation and upgrade software program-providing client revision checking, automated upgrades and centrally initiated configuration changes for all Peoplesoft users. Provided hardware, software and support services and consulting through the UW-System's Miler FASTAR initiative to

Wisconsin Campuses implementing Peoplesoft or' other shared or interfaced applications•.
Web server technologist for infrastructure design and implementation used for time keeping web-based application to student employees. Member of the UW-Madison campus Web portal review team. Project lead for middleware components-of the campus-wide Calendar and Scheduling Working Group. Responsible for determining integration requirements between Campus LDAP and Virtual Private Network services, security requirements and planning for campus-wide application infrastructure and implementation. Managed code creation, review and deployment for data import, user activation and client access for web portal 'integrated application. Windows Project Coordinator on the ESS implementation team responsible for Windows platform implementation and support of campus Enterprise Storage System. Extensive Microsoft Windows, Sun Solaris and IBM AIX system experience. Speaker at Peoplesoft International Users Conference on the topic of "Implementing in Non-centralized IT Environments."

Softmart, Inc. - ETG Technical Support Specialist, 1995 - 1996

Microsoft Windows 95 tier 1 and tier 2 helpdesk technical support. Received complete Microsoft technical product training on 'Windows 95 and Windows networking. Training in Microsoft NT 3.5 and 4.0. Developed materials and trained new engineers on product usage, troubleshooting, communications, Internet and multimedia support. Project leader: researching unresolved issues, gathering information and resolutions for communication, printing, multimedia and video issues. Developed, assigned and tracked research projects for other engineers. Microsoft Certified Professional. .

Comprehensive Law Enforcement Systems, Inc. Marketing Coordinator, 1992 - 1995

System consulting, marketing, advertising and all necessary sales support. Position included hardware and software consulting, proposal generation, ad development and placement, product literature development, press releases and trade show organization. Responsible for software system research, hardware configuration development, and system purchase for this company and its customers. Also responsible for implementation, configuration and maintaining internal PC hardware, office automation and customer tracking systems. Editor of quarterly newsletter. Developed, conducted and analyzed annual customer satisfaction survey. Developed and negotiated customer purchase agreements and support and maintenance contracts.

Data General Sales Representative; 1991 - 1992

,Direct sales and account management; specializing in new business development. Sales of UNIX-based minicomputers, personal computers and workstations. Development of system configurations and implementation of marketing programs and proposals. Negotiated purchase and support contracts with customers.

Ameridata, Inc. Account Manager; 1990 - 1991, Direct sales and installation assistance of microcomputer systems and networks to state and local government' agencies. Product demonstrations and workshops. Prepared Government Contract bid responses.

Easter Seal Systems - National Easter Seal Society Account Manager; 1988 - 1990 System analysis and system configuration of complete automation systems for the health care industry. Responsible for all system purchase, delivery for all customer systems and internal equipment and office automation tools. Development of marketing materials, training materials and proposals. Product seminars, demonstrations and training.' Responsible for sales management of 15 regional representatives across the United States and Canada. Development and maintenance of vendor contracts and contacts: ' Negotiated customer system and product support agreements.

EDUCATION

University of Wisconsin - Madison - Theatre
Management, product and marketing training from IBM, Data General, Microsoft and UW-Madison School of Business. Troubleshooting and Problem Resolution training from Microsoft, Data General and Compaq
Microsoft Certified Professional - Windows 95 and. Windows NT

Michael J. Thompson

(b)(6)

Education
Ph.D. in Educational Leadership and Policy Analysis, 2005--University of Wisconsin-Madison
Specialist Degree in Educational Administration, 1998--University of Wisconsin-Madison
M.S. in Educational Administration, 1992--University of Wisconsin –Madison
B.S. in Health and Physical Education, 1978--University of Wisconsin-Stevens Point

Areas of continuing education and training:

Curriculum development and evaluation
Total Quality Management
Team development and leadership
School-community collaborative partnerships
School Improvement
School Safety

Professional Work Experience
2001-Present Wisconsin Department of Public Instruction, Madison WI. Federal Policy Advisor to the State Superintendent. Responsibilities include overseeing and guiding policy development and program implementation regarding state compliance with federal education law. The position manages and coordinates studies and plans that cross division and department boundaries leading to policy development that impacts on programs, department operations, and joint efforts with the federal government and other state agencies, education interest groups, parents and the general public. This position includes overall responsibility for compliance with all federally funded programs, development of policy, proposed legislation and program plans.

1999-2001 Wisconsin Department of Public Instruction, Madison WI. Assistant Superintendent, Division for Equity and Advocacy. Division administration responsibilities include oversight of five mission teams, the Wisconsin School for the Deaf (WSD) and the Wisconsin Center for the Blind and Visually Impaired (WCBVI). The five teams include School Improvement, Special Education, Student Services/Prevention and Wellness, and Title I. The mission of the division is to provide technical assistance, leadership, advocacy, and staff development, training, and education to help meet the diverse needs of Wisconsin's youth, including their cultural, emotional, social, health, and educational needs. The division also administers, state and federal fiscal resources to local school districts.

1997-1999 Wisconsin Department of Public Instruction, Madison WI. Director for Student Services Prevention and Wellness (SSPW) Team. Supervisory responsibilities for education consultants and support staff in SSPW Team. Administrative responsibilities for Comprehensive School Health Education and the discipline of Driver Education and the four pupil service disciplines of School Counseling, Nursing, Psychology, and Social Work. Related program

responsibilities include: alcohol traffic safety, school age parents, career counseling, AIDS/HIV, AODA, suicide prevention, child abuse and neglect, school violence, human growth and development, comprehensive school health programs, compulsory attendance, and at-risk. The SSPW mission team administers over 14 million dollars in various state and federal discretionary and categorical grant programs.

1993-1997 Wisconsin Department of Public Instruction, Madison WI. Team Leader for Student Services Prevention and Wellness (SSPW). Management and coordination responsibilities for Comprehensive School Health Education and the discipline of Driver Education and the four pupil service disciplines of School Counseling, Nursing, Psychology, and Social Work. Related program responsibilities include: alcohol traffic safety, school age parents, career counseling, AIDS/HIV, AODA, suicide prevention, child abuse and neglect, school violence, human growth and development, comprehensive school health programs, compulsory attendance, and at-risk. The SSPW mission team administers over 14 million dollars in various state and federal discretionary and categorical grant programs.

1991-1993:. Wisconsin Department of Public Instruction, Madison WI. Section Chief for alcohol and drug abuse programs (AODA). Administration responsibilities included: management of state and federal AODA grant dollars, program development at the state and local level and supervision for education consultants, education specialists and program assistants.

1989-1991: Wisconsin Department of Public Instruction, Madison WI. Education Consultant for state and federal alcohol and other drug prevention programs. Responsibilities included: school district consultation, technical assistance, inservice training, curriculum development, and the promotion of preservice training at in-state colleges and universities.

1978-1989: Omro School District, Omro Wisconsin. Health Education Coordinator K-12. Responsibilities included: teaching, curriculum development and organization, program coordination, training and communication with staff, budget development and grant writing. Additional responsibilities included providing inservices to local and regional schools.

1981-1982: Winnebago County, Oshkosh Wisconsin. Consultant to Winnebago County and local communities as a community prevention specialist. Responsibilities and related experiences included: numerous talks to area service organizations and public groups, direction and facilitation of community meetings, and coordination of prevention activities.

Related Professional Experience

Conference, workshop and training presenter at the regional, state and national level. 1988-present.

Developed resources and curriculum guides in the areas of Alcohol and Other Drug Abuse, Integrated Prevention Programming, School Safety, Classroom Management and Student Discipline, Drivers Education, Pupil Services and School Counseling. 1993-present

Liaison and advisory member to several federal, state, and regional organizations dealing with health related school issues, school improvement and school leadership. 1989-present

Grant writing experience at the federal, state and local level. 1981-present.

Stephanie J. Petska, Ph.D.

(b)(6)

Experience: Director of Special Education, 1999—present
Wisconsin Department of Public Instruction
Position responsibilities:

- Provide statewide and national leadership for the implementation of education legislation, including special education, pupil nondiscrimination, open enrollment and charter school legislation at the state level, and the Individuals with Disabilities Education Act and the Elementary and Secondary Education Act at the federal level.
- Provide direction for education policy development and implementation.
- Recommend legislative and regulatory initiatives affecting all children, including children with disabilities.
- Develop and maintain effective working relationships with the governor's office, legislators, state agency personnel, educators, state and national professional associations and parent organizations.
- Conduct research and prepare reports and documents about multiple educational issues, including disability issues.
- Develop and deliver presentations for numerous agencies and organizations, including hearings and professional conferences.
- Negotiate and resolve issues with stakeholder groups, providing balance among multiple and differing perspectives.
- Develop, implement and evaluate statewide systems-change initiatives designed to improve results for children both in regular and special education.
- Approve $519 million in state and federal special education categorical aids.
- Manage the largest team in the department.
- Provide leadership for the operation of the statewide outreach programs and the state residential schools, including education, housing, health, food service and buildings and grounds.

Education Consultant, 1974—1999
Wisconsin Department of Public Instruction
Position responsibilities:

- Provide leadership and consultation about special education.
- Develop policy papers and bulletins on special education issues.
- Develop and deliver training for local educational agency staff and parents.

- Advise local educational agency staff and parents of rights and responsibilities.
- Resolve complaints.

Special Education Teacher, 1970-1974
Lincoln Public Schools
Lincoln, Nebraska

Education: Ph.D., Educational Administration/Behavioral Disabilities, 1982
University of Wisconsin
Madison, Wisconsin

M.S., Educational Administration/Behavioral Disabilities, 1978
University of Wisconsin
Madison, Wisconsin

B.S., Education, 1970
Nebraska Wesleyan University
Lincoln, Nebraska

Tiffany M. Boyd
(b)(6)

SUMMARY

Proficient Visual Basic/ ASP developer with professional experience in Object-Oriented, n-tier, database driven Internet technologies. Project Management and Supervisory experience. Strong team player with excellent communication skills.

TECHNICAL SKILLS

Languages/Tools: Visual Basic 6.0, VB.Net, C#, COM, XML, XSLT, HTML, VBScript, Visual Interdev, ASP, Active X, JavaScript, ChartFx, MapX, MapXtreme, UTFTP, ASPMail, Front Page, PL/SQL

Databases: Oracle 8i; Microsoft SQL Server 7.0/2000, Access 97/2000

Platforms: Windows NT/95/2000/XP

EXPERIENCE

Applications Development Team Supervisor
WI Department of Public Instruction **September 2004- present**

- Project manager and Technical Lead for the design and implementation of the Wisconsin Student Locator System (WSLS) and the Individual Student Enrollment System
- Responsible for planning and direction for application development at DPI, including formulation of the application development budget and charge back to user areas
- Determined staffing needs, established work plans and monitored progress of application development staff and contractors.
- Worked Directly with DPI division administrators regarding information processing needs.

IS System Development Services Specialist
WI Department of Public Instruction **January 2003- September 2004**

- Designed, developed and implemented P1202 Fall Staff Report Web Application using ASP and PL/SQL.
- Designed, developed and implemented Student Services Prevention Wellness AODA, Tobacco, and Safe & Drug-Free Schools End-of-Year Report Web Applications using ASP & PL/SQL.
- Maintained and enhanced ESEA Consolidated Web Application using ASP and PL/SQL.
- Maintained and supported the P1290 Enrollment, School Performance Data Collection, Wisconsin Student Assessment System Reports, Curriculum Resource Center, and Title 1 End-of-Year Report Web Applications.

- Served as Technical Lead for the Wisconsin Student Locator System work group at DPI, reviewing design specifications and coordinating DPI technical resources.
- Met with end-users to design and assess program at every phase of project.
- Wrote user and systems documentation for new programs.

Web Application Developer
Standard Networks Incorporation **January 2002 – January 2003**

- Developed a SOAP interface for MoveIT DMZ using VB.Net and XML.
- Developed a program to update and scrub improper tax account syntax for mortgage loan escrow accounts using C# in .Net and SQL Server 2000.
- Developed an expense voucher program to use direct transfer of funds for employee expense reimbursement using C# in .NET and SQL Server 2000.
- Designed, developed, and implemented Teller Performance program to create teller, branch and bank accuracy reports using VB, ASP, XML, XSLT, UTFTP, and SQL Server 2000.
- Designed, developed and implemented Branch Balancing Program to reconcile processed items with the bank general ledger using VB, ASP, XML, XSLT, UTFTP, and SQL Server 2000.
- Developed and implemented Currency Ordering System to process currency and coin orders from individual bank branches and their respective vaults using VB, ASP, XML, XSLT and SQL Server 2000.
- Developed and implemented Customer Inquiry web interface that allows bank employees to verify customer account data using ASP, VB.
- Wrote proposals and systems documentation for each program.
- Met with end-users to design and assess program at every phase of project.

Independent Consultant and Web Applications Developer
Primen, Incorporation, Madison, WI **January 2001 – December 2001**

- Lead Developer on DataPoint Application for filtering customer data based on customer characteristics, energy use or geographic location using ASP, VB, SQL Server 2000, MapXtreme, and ChartFX.
- Developer for Energy Shapes Application that allowed users to display energy load shape wave forms using ASP, VB, SQL Server 2000, Chart FX.
- Lead Developer for tool to allow users to perform complex database searches of the Load Management Programs and Technologies Database using ASP, VB, and ChartFX.
- Developed an interactive web-based Customer Relationship Management Program using VB, ASP and SQL Server 2000.
- Developed three interactive web based viewers for filtering databases of products, market profiles and survey results using VB, ASP and Access 2000.
- Developed automated mailing system to generate bulk mailings to customers using ASP, VB, SQL Server 2000 and ASPMail.

- Developed an interactive web-based skills inventory tool for filtering and updating employee skill profiles using VB, ASP and Access.
- Developed an interactive web-base Job Activation Form to facilitate project management on going project tasks and budgets using VB, ASP and Access.
- Wrote user guides for each program.
- Met with end-users design and assess projects at every phase of development.

Director of Mapping Services
Resource Technologies Corporation October 1997 – December 2000

- Project Manager and Lead Developer for GIS Model to assess impacts of mountaintop mining practices on coalfield communities in Appalachia using MapInfo and MapBasic.
- Project planning coordination and quality control for six GIS parcel conversion projects ranging in size from 30,000 to over 100,000 parcels.
- Supervised the creation of 3-D grid coal models for the Reserve Coal Valuation Model used to assess and appraise reserve coal in West Virginia.
- Supervised up to 18 employees including two shift supervisors, hired and trained new employees, conducted periodic performance reviews.
- Met with customers to ensure quality of work and fulfillment of contract.
- Provided week long, on-site customer training seminars for GIS customers.
- Assisted in development of two day long GIS seminars for state certified real estate appraisers and assessors.
- Represented company at conferences and trade shows, wrote project and grant proposals.
- Web page development and design using HTML and Front Page.
- Developed desktop Property Records System to interactively view and search assessment data and maps using VB, Access and MapX.
- Developed Mineral Tax System to update mineral assessment data for five Pennsylvania counties using ASP, VB and Access.
- Developed three plug-in programs to facilitate parcel management and maintenance of GIS parcels using MapInfo and MapBasic.

EDUCATION:

- Pennsylvania State University, University Park, PA. MS 1991; Masters Degree in Geography, GPA 4.0/4.0

- Dartmouth College, Hanover, NH. BA 1986; Double Major: Biology and Geography, *cum laude*, GPA 3.4/4.0

BRADLEY R. CARL

Office of Educational Accountability
Wisconsin Department of Public Instruction
125 S. Webster, P.O. Box 7841
Madison, WI 53707-7841
(608) 266-0890

Email: Bradley.Carl@dpi.state.wi.us

Education:

Ph.D. Sociology-Urban Studies, Michigan State University, 2004

B.A. International Studies and History, Hamline University, 1993

Professional Background:

Consultant for Statistics, Assessment, and Accountability, Wisconsin Department of Public Instruction, 2004 - present

Private Consultant in School Reform and Student Achievement, 1999 - present

Legislative Analyst, Program Evaluation Division, State of Wisconsin Legislative Audit Bureau, 2003 - 2004

Assistant Researcher, Center on Education and Work, University of Wisconsin-Madison, 2002 – 2003

Research Analyst, American Institutes for Research, 1999 – 2002

Instructor, Teaching Assistant, and Research Assistant, Michigan State University, 1994 - 1998

Professional Affiliations:

- American Educational Research Association
- Council for Exceptional Children
- Sociology of Education Association
- Urban Affairs Association

Selected Publications and Technical Reports:

Green, R.L. & Carl, B.R. (2004, September). *Expectations: How Teacher Expectations Can Increase Student Achievement and Assist in Closing the Achievement Gap.* New York: McGraw-Hill.

Green, R.L., Carl, B., & Zerbinos, E. (2004, May). *Preliminary Evaluation of the Dallas Independent School District's Commitments and Covenants.* Consultant report prepared for the Board of Trustees of the Dallas Independent School District.

Green, R.L., Griffore, R.J., Hall, R.E., Phenice, L.A., Schweitzer, J.H., Zerbinos, E., Bell, C., Brosi, W., Carl, B., Lewis, K., & Livingston, J. (2003, August). *Evaluation of School Improvement in the Detroit Public Schools: Phase II Final Report.* East Lansing, MI: Urban Affairs Programs.

Green, R.L., Griffore, R.J., Phenice, L.A., Schweitzer, J.H., Brosi, W.A., & Carl, B.R. (2003, June). *Evaluation of Skillman-Supported Comer Schools in the Detroit Public Schools.* Consultant report prepared for the Skillman Foundation and Detroit Public Schools.

Green, R.L., Griffore, R.J., Carl, B., Brosi, W.A., & Zerbinos, E. (2002, October). *An Assessment of Student Achievement in the Dallas Independent School District.* Consultant report prepared for the Board of Trustees of the Dallas Independent School District.

Green, R.L. et al (2002, January). *A Progress Report: School Improvement in the Detroit Public Schools, Phase 1.* Detroit, MI: New Detroit.

Mesmer, E., Ritter, S., Paulsen, C., Carl, B., Dailey, D., Shami, M., Hamilton, J., McInerney, M., & Gerver, M. (2001, July). *Evaluation Report for the Elementary and Middle Schools Technical Assistance Center (EMSTAC).* Washington, D.C.: U.S. Department of Education, Office of Special Education Programs (Contract No. HS97016001).

Herman, R., Carl, B., Lampron, S., Sussman, A., Berger, A., & Innes, F. (2000, August). *What We Know About Comprehensive School Reform Models.* Washington, D.C.: U.S. Department of Education, Office of the Undersecretary (Contract No. 282-98-0029).

Gruner, A., Fleming, E., Carl, B., Diamond, C., Ruedel, K., Saunders, J., Paulsen, C., & McInerney, M. (2000, August). *Synthesis on the Selection and Use of Assistive Technology.* Washington, D.C.: U.S. Department of Education, Office of Special Education Programs, Division of Research to Practice (Contract No. HS97017002).

Carl, B.R. & Green, R.L. (2000, May). A Reform Strategy for Troubled Times: Takeovers of Urban School Districts in the 1990s. *Annals of the American Academy of Political and Social Science.*

Green, R.L. & Carl, B. (2000, March). *Expectations: How Teacher Expectations Can Increase Student Achievement.* Dillon, CO: Alpine Guild, Inc.

Salas, G. & Carl, B. (1997, August). *A Profile of the Benito Juarez Academy.* East Lansing, MI: Urban Affairs Programs (unpublished report to the board of directors).

Salas, G. & Carl, B. (1997, August). *A Profile of the Casa Maria Academy.* East Lansing, MI: Urban Affairs Programs (unpublished report to the board of directors).

Selected Presentations:

Carl, B.R. (2005, June). "Current NCLB Issues: Testing in Grades 3-8." Presentation to the Association of Wisconsin School Administrators (Wisconsin Dells, WI).

Green, R.L. & Carl, B. (2002, October). "An Assessment of Student Achievement in the Dallas Independent School District." Presentation to the Board of Trustees of the Dallas Independent School District (Dallas, TX).

Hamilton, J., Carl, B., Ritter, S., & Dailey, D. (2002, April). "Is Your School Improving Outcomes for Students with Disabilities? Guesswork or Science?" Presentation at the Council for Exceptional Children exposition and conference (New York, NY).

Mesmer, E., Ritter, S., & Carl, B. (2001, April). "Can We Bridge the Gap? Evaluating Systemic Change Efforts at the Local Level." Presentation at the Council for Exceptional Children exposition and conference (Kansas City, MO).

Carl, B.R. (1999, April). "The Role of For-Profit Management Firms in the Michigan Charter School Experience." Presentation at the American Educational Research Association conference (Montreal, Quebec).

Carl, B.R. (1998, April). "Promising Alternative and Potential Danger: Charter Schools and the Education of At-Risk Youth." Presentation at the American Educational Research Association conference (San Diego, CA).

Carl, B.R. (1998, February). "Cause for Optimism and Caution: Michigan's Charter School Experience, Disadvantaged Youth, and the Future of Public Education." Presentation at the Sociology of Education Association conference (Monterey, CA).

Carl, B.R. (1997, April). "Urban Schools in the New Reform Movement: Impacts and Implications of Charter Schools for Urban Areas." Presentation at Urban Affairs Association conference (Toronto, Ontario).

Salas, G. & Carl, B.R. (1997, March). "Charter Schools: An Educator's Alternative for High-Risk Youth." Presentation at National Middle Schools Association conference (Chicago, IL).

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Pär Jason Engle

EDUCATION	*8/2003 – 5/2005* *University of Wisconsin-Madison* ▪ MPA, Policy Analysis - 3.9/4.0 *8/1992 - 5/1996* *Beloit College, Beloit, WI* ▪ BA, Economics; Magna Cum Laude - 3.6/4.0. ▪ Honors include: Dean's List, Phi Beta Kappa, Wall Street Journal Award (1996)
EXPERIENCE	*8/2004 - Present* *Wisconsin Department of Public Instruction, Madison, WI* **Education Consultant – Standards Based Assessment** ▪ Analyze implementation and achievement results of the Comprehensive School Reform (CSR) program using end-of-year reports and existing Wisconsin Knowledge and Concepts (WKCE) assessment results. ▪ Prepare detailed report of results to comply with required federal evaluation due in December 2004.
	8/2003 – 5/2005 *La Follette School of Public Affairs, Madison, WI* **Project/Research Assistant Positions** ▪ (August 2004-May 2005) With Prof. Don Nichols, research, analyze policy options to increase the use of wood fuel in Wisconsin. ▪ (Summer 2004) With Prof. David Weimer. The report, *Enhancing Criminal Sentencing Options in Wisconsin: The State and County Correctional Partnership,* was presented to the Wisconsin Sentencing Commission in October 2004. ▪ (August 2003-August 2004) Extensive compilation and analysis of national and district school data, focusing on charter schools in Wisconsin, with Prof. John Witte. Co-authored *The Political Economy of School Choice*, available at http://www.lafollette.wisc.edu/wcss/papers.html.

	2/2001 - 8/2003 *Madison Metropolitan School District, Madison, WI* **Data Analyst – Research & Evaluation Department** ▪ Conducted statistical analysis of district and school data related to program performance using a variety of methods and software, including SPSS, Microsoft Access, DB2 tools (IBM), and MySQL among others. ▪ Prepared reports on school performance on mandated testing, with an increased focus on growth/longitudinal design and web delivery. Responded to queries from members of the School Board, the media, and the public. Presented findings in accessible, user-friendly formats for these audiences. ▪ Conducted workshops on testing data for school staff and regularly served as a tutoring resource at MMSD's "Data Academy".
EXPERIENCE	*11/1998 - 2/2001* *Robert W Baird and Company, Milwaukee, WI* **Application Developer, Investment Banking & Corporate Finance Division** ▪ Designed, coordinated and maintained database systems for banking staff of over 100 professionals at five locations. ▪ Created, implemented, and maintained web applications in mergers/acquisitions data modeling, expense tracking, and records tracking/document management.
	2/1998 - 9/1998 *Dieringer Research Group, Milwaukee, WI* **Programmer/Analyst** ▪ Tabulated, analyzed and reported survey results from numerous telephone interviews. ▪ Assisted in survey design and presentation.
	6/1997 - 1/1998 *Northern Technical Services, Milwaukee, WI* **Programmer/Analyst** ▪ Programmed database systems using Microsoft Access, Crystal Reports and ObjectPro to provide tracking of orders, quotes and inventory.

	8/1996 - 5/1997 *The Democratic Leadership Council, Washing* **Development Assistant** ▪ Maintained information on corporate donors. ▪ Developed data systems to facilitate event planning, tailored to attracting and engaging donors from a variety of industries.
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GORM R. HEILSKOV

(b)(6)

(608) 267-0376 (W) ((b)(6)

Objective: Opportunity to utilize technical and supervisory experience in the field of database administration.

Professional Experience

Wisconsin Department of Public Instruction *August 1996 to Present*

DATABASE ADMINISTRATOR. Oracle

Served as DBA for five production and three test Oracle Databases on Netware 411 and 50 platforms and then on Windows platforms. Created, administered and upgraded these databases. Installed sqlnet in client/server environment. Upgraded these databases from version 7.1.6 to 7.2.4.14 and then to 8.0.4.2.3 and 8.0.4.2.6 and then to 8.1.7 and then to 9.2.0.4.

UW-Madison Department of Information Technology *March, 1994 to August, 1996*

DATABASE ADMINISTRATOR. Oracle and ADABAS

Served as DBA for six Oracle Databases and two ADABAS databases on four IBM RS/6000 UNIX platforms. Created, administered and upgraded these databases. Built Oracle Data Warehouse for University Data. Installed sqlnet in client/server environment. Designed and implemented system for scheduling and loading tables into Warehouse automatically. Served as DBA for two additional ADABAS databases on a DOS/VSE platform.

University of Wisconsin-System Administration *February, 1990 to February, 1994*

SYSTEMS PROGRAMMER

Served as Systems Programmer in charge of installing and supporting Software AG products in a DOS/VSE environment on an IBM 4381. Installed and supported the SAG products ADABAS, NATURAL, NATURAL VSAM, NATURAL SECURITY, PREDICT, SUPER NATURAL, NATURAL CONSTRUCT, NATURAL ADVANCED FACILITIES, NATURAL CONNECTION. Installed and supported ADABAS, NATURAL, PREDICT and NATURAL CONSTRUCT on an IBM RS/6000.

Became familiar with and trained others in the use of all of the above products excluding NATURAL CONSTRUCT. Wrote assembler user exits for ADABAS Hyperdescriptors and NATAF RJE.

Served as DBA starting in 1993.

University of Wisconsin-System Administration *October, 1982 to January, 1990*

INFORMATION SYSTEM AREA CONTACT

Served as the area contact in coordinating work activities and performing all necessary lead work functions for all U.W. Centers and Office of Analysis Services computer systems operating at

this office. Proposed and developed security system used as the standard in office on-line applications under Natural. Proposed and developed data access interface used as the standard in office batch COBOL applications which access ADBAS. Converted existing systems, brought up new systems and designed and implemented file structures under ADABAS.

University of Wisconsin Centers *July, 1981 to October, 1982*
MANAGER OF INFORMATION SYSTEMS
Directed and reviewed work of two classified MIS programmer-analysts. Supervised Analysis, programming and operations efforts for a small data processing office.

University of Wisconsin Center System *June, 1977 to June, 1981*
LEAD PROGRAMMER
Directed and reviewed work of one classified MIS programmer. Supervised programming and operations efforts for a small data processing office.

University of Wisconsin Center System *February, 1976 to June, 1977*
APPLICATIONS PROGRAMMER
Programmed fluently in COBOL and RPGII.
Programmed in Fortran and Assembler.

Education

University of Wisconsin, Madison *1976 to 1980*
Received BBA May 1980.

- Major Information Systems Analysis & Design.

	Robert H. Meyer CURRICULUM VITAE	April 2005

OFFICE:	WCER, Room 781 University of Wisconsin 1025 West Johnson Street Madison, WI 53706-1796 (608) 265-5663	(b)(6)
E-MAIL:	rhmeyer@wisc.edu	(b)(6)

EDUCATION:

1991 Ph.D., Public Policy, Kennedy School of Government, Harvard University
Dissertation: Beyond Academic Reform: The Role of Vocational Education in American Secondary Education

1978 Masters in Public Policy, Kennedy School of Government, Harvard University

1975 A.B., Economics, Harvard College

PROFESSIONAL BACKGROUND:

1998- Senior Scientist and Center Director, Value-Added Research Center, Wisconsin Center for Education Research (WCER)

1998-2001 Lecturer and Research Associate, Harris Graduate School of Public Policy Studies, University of Chicago

1992-1998 Assistant Professor, Harris Graduate School of Public Policy Studies, University of Chicago

1991-1992 Assistant Professor, Economics Department and La Follette Institute of Public Affairs, University of Wisconsin-Madison

1989-1991 Instructor, Economics Department and La Follette Institute of Public Affairs, University of Wisconsin-Madison

1986-1989 Senior Economist, National Assessment of Vocational Education, U.S. Department of Education

1983-1986 Research Associate, The Brookings Institution

1982-1983 Staff Economist, Council of Economic Advisers

PUBLISHED RESEARCH

"Explaining Variation in the Effects of Welfare-To-Work Programs," (with David Greenberg, Charles Michalopoulous, and Michael Wiseman), Evaluation Review, Vol. 27, no. 4, August 2003, pp. 359-394.

"Value-Added Indicators," The Newsletter of the Comprehensive Center – Region VI, Vol. 6, No. 1, Spring 2001, Wisconsin Center for Education Research, University of Wisconsin-Madison, pp. 7-10.

"Comment on Searching for Indirect Evidence for the Effects of Statewide Reforms," Brookings Papers on Education Policy, 2001, pp. 218-223, 228-229.

"Value-Added Indicators: A Powerful Tool for Evaluating Science and Mathematics Programs and Policies," Issue Brief, Vol. 3, No. 3, 2000, National Institute for Science Education, University of Wisconsin-Madison, 11 pp.

"The Production of Mathematics Skills in High School: What Works?" in Mayer, Susan and Peterson, Paul (eds.), Earning and Learning: How Schools Matter, Washington, DC: Brookings Institution, 1999, pp. 169-204.

"Value-Added Indicators of School Performance," in Hanushek, Eric A. and Jorgenson, Dale W. (eds.), Improving the Performance of America's Schools, Washington, DC: National Academy Press, 1996, pp. 197-223. A modified version of this paper was published as" Value-Added Indicators of School Performance: A Primer," Economics of Education Review, Vol. 16, No. 3, June 1997, pp.283-301.

"Fair and Valid Indicators of School Performance" in Ladd, Helen F. (ed.), Holding Schools Accountable: Performance-Based Reform in Education, Washington, DC: Brookings Institution, 1996, pp.137 - 145; also published in The Report, Harris Graduate School of Public Policy Studies, January, 1997.

"Public School Choice in Minneapolis," (with Steven Glazerman), in Downes, Thomas A. and Testa, William (eds.), Midwest Approaches to School Reform, Proceedings of a Conference Held at the Federal Reserve Bank of Chicago, October 26-27, 1994.

"Multisite Employment and Training Program Evaluations: A Tale of Three Studies"(with David Greenberg and Michael Wiseman), Industrial and Labor Relations Review, Vol. 47, No.4, 1994, pp. 679-691.

"Can Schools Be Held Accountable for Good Performance? A Critique of Common Educational Performance Indicators," in Hoffman, Emily P.(ed.), Essays on the Economics of Education, Kalamazoo:W.E. Upjohn Institute for Employment Research, 1993, pp. 75-109.

"Vocational Training in the United States" (with Robin S. Horn), in Husen, Torsten and T. Neville Postlethwaite(ed.), International Encyclopedia of Education, Oxford:Pergamon Press, 1990, pp.706-714 (also available as "Reform of Secondary Vocational Education in the United States," Institute for Research on Poverty Discussion Paper #923-90, University of Wisconsin at Madison) .

"National Assessment of Vocational Education: Testimony Before the House Education and Labour Committee" (with John Wirt, Lana Muraskin, and David Goodwin), Economics of Education Review, Vol. 8, No. 4, 1989, pp. 383-392.

"Adjusting to Economic Change" (with Robert Z. Lawrence, Lawrence B. Krause, and Linda Cohen), in Alice M. Rivlin (ed.), Economic Choices 1984, The Brookings Institution, 1984, pp. 119-156.

"The Transition from School to Work: The Experiences of Blacks and Whites" (with David Wise), in Ehrenberg, R. (ed.), Research in Labor Economics, Vol. 6, JAI Press, Inc., 1984, pp. 123-176.
"Discontinuous Distributions and Missing Persons: The Minimum Wage and Unemployed Youth" (with David Wise), Econometrica, Vol. 51, No. 6, 1983, pp. 1677-1698.

"The Effects of the Minimum Wage on the Employment and Earnings of Youth" (with David Wise), Journal of Labor Economics, Vol. 1, No. 1, University of Chicago Press, 1983, pp. 66-100.

"Job Training in the Schools," Taylor, Rosen, and Pratzer (eds.), Job Training for Youth, Columbus, Ohio: The Ohio State University, 1982, pp. 307-344.

"High School Preparation and Early Labor Force Experience" (with David Wise) in R. Freeman and D. Wise, The Youth Labor Market Problem: Its Nature, Causes, and Consequences, National Bureau of Economic Research, Chicago: University of Chicago Press, 1982, pp. 277-347.

RECENT REPORTS AND GOVERNMENT PUBLICATIONS

"Participation in the Student Achievement Guarantee in Education (SAGE) Program and Performance on State Assessments at Grade 3 and Grade 4 for Three Cohorts of Students," (with Norman Webb and Adam Gamoran), Wisconsin Center for Education Research, February 2004, 83 pp.

"An Evaluation of the Effectiveness of the Urban Systemic Initiative and Other Academic Reforms in Texas: Statistical Models for Analyzing Large-Scale Datasets, report prepared for the National Science Foundation, Wisconsin Center for Education Research, December 2001, 55 pp.

"Estimation of Teacher and School Performance in the Denver Public School: A Feasibility Study," report prepared for the Denver Public Schools and the Community Training Assistance Center, November 2001, 36 pp.

"Student Achievement and School Performance in Minneapolis," report prepared for the Consortium for Policy Research in Education, University of Wisconsin-Madison, November 2000, 43 pp.

SELECTED WORKING PAPERS AND UNPUBLISHED PAPERS

"The Integrated Qualitative and Quantitative (IQ^2) Research Framework," Unpublished paper, Wisconsin Center for Education Research, April 2005.

"A generalized additive value-added model of school performance," Unpublished paper, Wisconsin Center for Education Research, September 2004.

"Statistical methods to evaluate the sage program: using before and after data to control for student and school selectivity and a method for eliminating contamination bias due to mobility between treatment and control schools," Unpublished paper, Wisconsin Center for Education Research, May 2004.

"Value-Added Indicators: Do They Make a Difference? Evidence From the Milwaukee Public Schools," WCER Working Paper No. 2003-5, Wisconsin Center for Education Research, April 2003. (www.wcer.wisc.edu/publications/workingpaper/paper/Working_Paper_No_2003_5.pdf)

"On Vocational Education Indicators," paper prepared for the U.S. Department of Education, September 1998, 20 pp.

"Prying the Lid From the Black Box: Plotting Evaluation Strategy for Welfare Employment and Training Programs" (with David Greenberg and Michael Wiseman), Institute for Research on Poverty, Discussion Paper 999-93, March 1993, 55 pp.

PROFESSIONAL ORGANIZATIONS

American Economic Association Econometric Society	National Council on Measurement in Education American Education Research Association

Curriculum Vita

Dr. Christopher A. Thorn
University of Wisconsin-Madison
Wisconsin Center for Education Research
1025 W. Johnson St., Room 370
Madison, WI 53706
Phone: (608) 263-2709, Fax: (608)-265-9300
Email: cathorn@wisc.edu

Education

Doctor of Sociology (with high honors), University of Bielefeld, Germany, 1994
M.A., Political Science, University of Wisconsin-Madison, 1990
M.A., International Relations, The Johns Hopkins University, 1987
B.A., (with honors) Economics and German Language Indiana University, 1985

Current Research

Principal Investigator
Chicago Community Trust Education Initiative Evaluation
This three year evaluation effort will be a multi-methods study that examines the three primary areas of the Chicago Community Trust's Education Initiative—Literacy, Professional Development, and Alternative Schools. The research design is based on a nested case model. This model will provide a within-initiative analysis of differing delivery models and goals, as well as a cross-initiative-area comparison of implementation strategies that are independent of content area. In addition, the evaluation team will explore the institutional relationships formed by the various grantees, and the relationships between differing constellations of actors and success.

Technology Team Leader & Indicator System Data Analysis Leader
System-Wide Change for All Learners and Educators (SCALE)
Five-year NSF-funded research and dissemination project for designing and implementing math and science immersion curricula in K-12 districts. I am the lead of the technology team and working with team leaders in evaluation, curriculum design, and professional development to develop and deploy research-based information technology systems and work processes that support the core goals of the project. I also lead the district-level data analysis team that is evaluating the impact of SCALE activities on teacher practices and student learning.

Grants, Honors, & Fellowships

Chicago Community Trust ($427,000) – June, 2005-September, 2008
UCSD/SDSC, NSF Subcontract ($304,000) – October, 1999-December, 2004
UW-Madison, School of Education, Distinguished Achievement Award – April, 2004
Carnegie Mellon University, NSF Subcontract ($131,000) – December, 2000-August, 2002
Spencer Foundation Research Grant ($50,000) – April, 1999-April, 2000
Deutsche Forschungsgemeinschaft Research Fellowship, 1993-96
University of Wisconsin Big Ten Traveling Scholar Grant, 1991
German Academic Exchange Service Pre-Dissertation Research Grant, 1990
Fulbright Commission Collaborative Research Grant, 1989
Phi Beta Kappa, Indiana University Chapter, 1985

Employment History
University of Wisconsin-Madison, Wisconsin Center for Education Research
Assistant Scientist & Director of Technical Services – August 1997 to Present
Lecturer in Research Methods, Educational Psychology – Spring 2005 Semester

University of Wisconsin-Madison, Center on Education and Work
Assistant Researcher – December 1995 to August 1997

University of Bielefeld, Bielefeld, Germany
Associate Investigator – June 1992 to May 1996

University and Professional Service
IFIP: IT in Educational Management Working Group (Secretary) – 2004-2007
AERA Standing Committee on Technology (Chair 2002-2004, 2005-2007) – 2001-2007
UW-Madison, Automated Travel System Development Group, (Co-Chair) – 2005-Present
UW-Madison, School of Education, IT Steering Committee – 1999-Present
UW-Madison, School of Education, IT Policy Advisory Committee – 1997-Present

Professional Activities
Spencer Foundation – Information Systems & Strategy Consultant – 2003-Present
MacArthur Research Network on Teaching and Learning – Consultant to the Information Infrastructure System Project – 2002-2004

Professional Affiliations
American Educational Research Association (AERA)
International Federation of Information Processing: IT in Educational Management (IFIP)

Publications - Books & Articles
Thorn, Christopher A. (2005). Systemic Reform Efforts in the U.S.: Role of Information Technology in Fostering Collaboration within New Partnerships. In Adrie Visscher, Javier Osorio, and Arthur Tatnall (Eds.). *Information Technology in Educational Management*, Dordrecht, Netherlands, Kluwer Academic Publishers.
Thorn, Christopher A. (Forthcoming). The Challenge of Supporting Complex University-School District Partnerships: Scaling up for Whole District School Reform. In Madanmohan Rao (Ed.). *Cultures of Knowledge: How KM Practitioners Nurture and Sustain Knowledge Creating Cultures*, McGraw-Hill, New Delhi.
Thorn, Christopher A. 2004. Building New Systems for Decision Support: Was there a baby in that bathwater? In Arthur Tatnall (Ed.). *Web Portals: the New Gateways to Internet Information and Services,* Idea Group Inc. Melbourne, Australia.
Thorn, Christopher A. 2003. Making Decision Support Systems Useful in the Classroom: Designing a Needs Assessment Process. In Ian Selwood, Alex Fung, and Tuulikki Paturi (Eds.). *Information Technology in Educational Management*, Dordrecht, Netherlands, Kluwer Academic Publishers.
Thorn, Christopher A. 2001. Knowledge Management for Educational Information Systems: What Is the State of the Field? *Education Policy Analysis Archives* 9(47).

Witte, John F. and Christopher A. Thorn. May 1996. Who Chooses? Voucher and Interdistrict Choice Programs in Milwaukee. *American Journal of Education.*

Willke, Helmut, Carsten P. Krueck, and Christopher A. Thorn. 1995. *Benevolent Conspiracies: the role of enabling technologies in the welfare of nations: the cases of SDI, SEMATECH, and EUREKA*. New York: W. de Gruyter.

Reports and Papers

Thorn, Christopher A. February 2003. Overview of School Operation and Decision Support Software. A report to the MacArthur Teaching and Learning Network, University of Chicago - Center for School Improvement.

Thorn, Christopher A. April 2002. Data Use in the Classroom: The Challenges of Implementing Data-based Decision-making at the School Level. New Orleans, American Education Research Association Annual Conference.

Thorn, Christopher A. March 2002. Making Decision Support Systems Useful in the Classroom: Designing a Needs Assessment Process. Albuquerque, NM, National Center for Education Statistics, 15th Annual MIS Conference.

Thorn, Christopher A. July 2000. "Knowledge Management for Educational Information Systems: What is the state of the field?" Paper presented at the NCES Data Forum, Washington, D.C.

Thorn, Christopher A. July 1999. "Systemic Reform and the MPS Information System," in *Technical Reports on Milwaukee Public Schools Policy, Information Systems, and Instructional Alignment.* Technical Report 99-1. Madison, WI: University of Wisconsin Madison, Wisconsin Center for Education Research.

Thorn, Christopher A. December 1998. "Information System Design in Support of Reform Efforts," in *Technical Reports on Milwaukee Public Schools Policy, Information Systems, and Instructional Alignment.* Technical Report 98-1. Madison, WI: University of Wisconsin Madison, Wisconsin Center for Education Research.

Invited Presentations

January 2004. "Knowledge Management and Collaborative Tools in Complex Partnerships," NSF Math and Science Partnership Learning Network Conference, Washington, D.C.

November 2003, "Decision Support in District Reform Efforts," Consortium for School Improvement, University of Chicago.

January 2003. "Organic School Information Systems: Building a spirit of inquiry versus terraforming by data warehouse." Keynote address and workshop for the Ministry of Education, Ontario Province, Canada.

December 2002. "Superintendents as IT Sensemakers: Information Systems in Support of Instructional Decision Making." University of Pittsburgh Superintendents' Forum - Keynote address.

November 2002. "Characteristics of successful decision support systems." Wisconsin Department of Public Instruction.

March 2002. "Digital Insight and Transana: Enabling New Histories of Learning for Math and Science Instruction. National Partnership for Advanced Computational Infrastructure, All Hands Meeting, San Diego Supercomputer Center.

January 2001. "Issues in Building District-Level Knowledge Management Systems." Wisconsin School Boards Association Conference. Milwaukee, WI.

VITA
Eileen M. Kellor

(b)(6)

Education
M.S., Industrial Relations, Industrial Relations Research Institute, University of Wisconsin-Madison
Emphasis: Unions and collective bargaining

B.A., Economics, University of Wisconsin-Madison. *Emphasis*: Labor Economics and Labor History

Professional Work History

Consortium for Policy Research in Education, Teacher Compensation Project, UW-Madison
Associate Researcher ***June 1998 through January 2005***

- Developed, administered and analyzed employee and supervisor attitude surveys
- Planned and conducted structured data-gathering interviews of employees, supervisors and policy-makers and interpreted and analyzed responses
- Identified data needs and sources and worked with research site to obtain data and supporting documents
- Planned and coordinated practitioner dissemination and marketing activities, including website, listserv, and e-newsletter, and annual national conference on teacher compensation and evaluation.
- Researched and wrote case studies and papers on state and local K-12 compensation programs, standards-based teacher performance appraisal and licensure initiatives, and related topics.
- Developed and presented instructional content for compensation design seminars
- Provided technical assistance to organizations interested in implementing new forms of compensation or performance appraisal

State of Wisconsin, Department of Employment Relations, Division of Classification and Compensation, Compensation Administration Manager ***January 1989-June 1998***

- Hired, supervised, and developed staff responsible for developing, implementing, and administering the compensation, leave and benefit provisions for non-represented state employees and elected officials, and for administering the compensation provisions for represented employees.
- Planned and coordinated communication of compensation and benefit program details and issues with state employees and appointed and classified civil service managers in over 40 agencies with offices located across the state.
- Member of statewide management bargaining teams, prepared and presented compensation proposals, provided interpretations and answered questions for management and union teams, took official bargaining notes, prepared contract language in accordance with negotiated agreements
- Interpreted and applied and provided technical assistance and consultation to operating agency personnel representatives on administrative rules, collective bargaining agreements, and federal and state laws relating to employment and benefits, including state and federal family medical leave acts and Fair Labor Standards Act

- Developed and presented formal and informal training on compensation and benefit provisions for a wide range of technical and general audiences.

State of Wisconsin, Department of Employment Relations, Division of Classification and Compensation Classification Team Leader ***September 1987-December 1988***

State of Wisconsin, Department of Employment Relations, Division of Classification and Compensation Classification Analyst ***September 1985-September 1987***

Rock County (Janesville, WI) Personnel Department
Personnel Generalist ***March 1984-September 1985***

Publications

Kellor, E.M. (2005). *Catching Up with the Vaughn Express: Six Years of Standards-Based Teacher Evaluation and Performance Pay.* Educational Policy Analysis Archives, January 2005.

Kimball, Steven M., Herbert G. Heneman III, & Eileen M. Kellor. (in press). *Can Pensions Help Attract Teachers?* Journal of Education Finance.

Conference Presentations

Three Strategies for Connecting the Framework to Teacher Pay: State, District and School Level Examples. Framework for Teaching Users Conference, June 2001, Cleveland, OH.

Cincinnati: A Case Study of the Design of a School-Based Performance Award Program, American Education Finance Association Meeting, March 1999, Seattle, WA.

Using the Framework as a Tool to Align an Internal Human Resources System. Framework for Teaching Users Conference, June 2000. Wakefield, MA.

Kimball, Steven M., Herbert G. Heneman III, & Eileen M. Kellor. (2003, March 27-29, 2003). *Pensions for Teachers: Possible Changes and Implications.* Paper presented at the American Education Finance Association Annual Conference, Orlando, FL.

Professional service activities

- Review and analysis of the classified positions in the WCER Business Office.
- Participated on internal WCER committee responsible for reviewing annual performance evaluations for WCER academic staff and making salary increase recommendations.
- Member of internal DER Affirmative Action Advisory Committee.
- Employee Assistance Resource Coordinator for DER employees.

Relevant community and volunteer service

- Girl Scouts of Black Hawk Council to the Council's Good to Great Strategic Planning Advisory Committee.
- Board chair, board member, Red Caboose Day Care Center..
- Administrative volunteer (Community Co-Chair) and local troop leader for Girl Scouts of Black Hawk Council.
- Former president, Wisconsin Industrial Relations Research Alumni Association; previous board member and member.

Curriculum Vitae

DOUGLAS M. BATES

Business Address:
Department of Statistics
University of Wisconsin
1210 West Dayton Street
Madison, WI 53706
608/262–2598

(b)(6)

Education

Ph.D., 1978, Statistics, Queen's University at Kingston

M.S., 1973, Mathematics, University of California -Los Angeles (U.C.L.A.) B.Sc.(Hons.), 1971,

Mathematics, Queen's University at Kingston

Experience

Professor; Department of Statistics; University of Wisconsin - Madison; 1994– present.

Professor and Chair; Department of Statistics; University of Wisconsin - Madison; 1991–1994.

Assistant Professor, Associate Professor, and Professor; Department of Statistics; University of Wisconsin - Madison; 1980–1991.

Adjunct Visiting Professor; Department of Mathematics and Statistics; Queen's University at Kingston; 1984.

Statistical Consultant; Statistical Laboratory; University of Wisconsin - Madison; 1980–1982.

Assistant Professor; Department of Mathematics; University of Alberta; 1978– 1980.

Honors

Elected a Fellow of the American Statistical Association, 1992.

Recent and Selected Publications

Papers published in, or accepted by refereed journals

1. "Relative Curvature Measures of Nonlinearity", *Journal of the Royal Statistical Society, Ser. B*, **42**, 1–25, 1980. (With D. Watts).
2. "Accounting for Intrinsic Nonlinearity in Nonlinear Regression Parameter Inference Regions", *Annals of Statistics*, **10**, 386–393, 1981. (With D. Hamilton and D. Watts).
3. "Parameter Transformations for Improved Approximate Confidence Regions in Nonlinear Least Squares", *Annals of Statistics*, **9**, 1152– 1167, 1981. (With D. Watts).
4. "A Relative Offset Orthogonality Convergence Criterion for Nonlin-ear Least Squares", *Technometrics*, **23**, 179–183, 1981. (With D. Watts),
5. "Calculation of Intrinsic and Parameter-Effects Curvatures for Non-linear Regression Models", *Communications in Statistics – Simulation and Computation*, **12**, 469–477, 1982. (With D. Hamilton and D. Watts).
6. "A Multi-Response Gauss–Newton Algorithm", *Communications in Statistics – Simulation and Computation*, **13**, 705–715, 1983. (With D. Watts).

7. "The Derivative of $X_1 X_1$ and Its Uses", *Technometrics*, **25**, 373– 376, 1983.
8. "Non-Negative Regression by Givens Rotations", *Communications in Statistics – Simulation and Computation*, **13**, 841–850, 1984. (With D. Wolf).
9. "Fitting First Order Kinetic Models Quickly and Easily", *Journal of Research of the National Bureau of Standards*, **90**, 433–438, 1985. (With D. Watts).
10. "Efficient Support of Statistical Operations", *IEEE Transactions on Software Engineering*, **11**, 1058–1070, 1985. (With S. Khoshafian and D. DeWitt).
11. "Multiresponse Estimation with Special Application to Systems of Linear Differential Equations", *Technometrics*, **27**, 329–339, 1985. (With D. Watts).
12. "GCVPACK – Routines for Generalized Cross Validation", *Communications in Statistics – Simulation and Computation*, **16**, 263–297, 1987. (With M. Lindstrom, G. Wahba, and B. Yandell).
13. "A Generalized Gauss–Newton Procedure for Multi-Response Parameter Estimation", *SIAM Journal of Scientific and Statistical Com-puting*, **7**, 49–55, 1987. (With D. Watts).
14. "Newton–Raphson and EM Algorithms for Linear Mixed Effects Models for Repeated Measures Data", *Journal of the American Statistical Association*, **83**, 1014–1022, 1988. (With M. Lindstrom).
15. "The Computation of GCV Functions Through Householder Tridiagonalization with Application to the Fitting of Interaction Spline Models", *SIAM J. Matrix Anal. Applic.*, **10**(4), 457–480, 1989. (With C. Gu, Z. Chen, and G. Wahba)
16. "Approximate Inferences in Multiresponse Regression Analysis", *Biometrika*, **77**(2), 321–331, 1990. (With G. Kang).
17. "Nonlinear Mixed Effects Models for Repeated Measures Data", *Bio-metrics*, **46**, 673–687, 1990. (With M. Lindstrom).
19. "Model Building in Chemistry Using Profile t and Trace Plots", *Chemo-metrics and Intelligent Laboratory Systems*, **10**, 107–116, 1991. (With D. Watts).
18. "Loosely Coupled Nonlinear Least Squares", *Computational Statis-tics and Data Analysis*, **14**, 249–259, 1992. (With Y-W. Soo).
19. "Getting Better Contour Plots with S and GCVPACK", *Computational Statistics and Data Analysis*, **15**, 329–342, 1993. (With F. Reames and G. Wahba).
20. "Approximations to the Log-Likelihood Function in the Nonlinear Mixed Effects Model", *Journal of Computational and Graphical Statistics*, **4**, 12–35, 1995. (With J. Pinheiro).
21. "Multiresponse Spline Regression", *Computational Statistics and Data Analysis*, **18**, 619–631, 1996. (With Y.-W. Soo).
22. "Parameterizations for Variance-Covariance Matrices", *Statistical Computing*, **6**, 289–296, 1996. (With J. Pinheiro)
23. "Linear and nonlinear mixed-effects models", *Applied Statistics in Agriculture*, **10**, 1–21, 1998. (With J. Pinheiro)

Books

Nonlinear Regression Analysis and Its Applications, Wiley, New York, 1988. (With Donald G. Watts).
Minitab Supplement for Devore's "Probability and Statistics for Enggneering and the Sciences", Brooks/Cole, Belmont, CA, 1991.
Mixed-effects Models in S and S-PLUS, Springer-Verlag, New York, 2000. (With Jose C. Pinheiro).

Recent Invited Proceedings Papers or Book Chapters

"A Framework for Research in Database Management for Statistical Analysis", in *Proceedings of the ACM Special Interest Group on the Management of Data*, Assoc. for Computing Machinery, New York, 1982. (With H. Boral and D. DeWitt).
"Teaching Statistical Computing" in *Proceedings of the Statistical Computing Section*, American Statistical Assoc, New York, 1982.
"Computational Methods for Generalized Cross Validation with Large Data Sets" in *Treatment of Integral Equations by Numerical Methods*, eds. C. Baker and G. Miller, Academic Press, New York, 1982. (With G. Wahba).
"Computational Methods for Generalized Cross Validation" in *Proceedings of Computer Science and*

Statistics: Sixteenth Symposium on the Interface, ed. L. Billard, North-Holland, New York, 1983.
"Secondary Storage Methods for Statistical Computational Operations" in *Proceedings of Computer Science and Statistics: Sixteenth Symposium on the Interface*, ed. L. Billard, North-Holland, New York, 1983. (With S. Khoshafian and D.DeWitt).
"Simplified Methods of Assessing Nonlinearity" in *Proceedings of the Business and Economics Statistics Section*, American Statistical Assoc, New York, 1983. (With M. Goldberg and D. Watts).
"Nonlinear Least Squares and First-Order Kinetics" in *Proceedings of Computer Science and Statistics: Seventeenth Symposium on the Interface*, ed. D. Allen, North-Holland, New York, 1985. (With D. Wolf and D. Watts).
"Database Machine Support for Efficient Access to Large Statistical Databases" in *Proceedings of the First LBL Workshop on Statistical Database Management*, 233–236, ed. H. Wong, Lawrence Berkeley Laboratory, Berkeley, CA, 1985. (With H. Boral and D. DeWitt).
"Statistical Models as Data Structures", in *Proceedings of Computer Science and Statistics: Nineteenth Symposium on the Interface*, ed. R. Heiberger, North-Holland, New York, 1987. (With J. Chambers).
"A Comparison of Approaches to Inference for Nonlinear Models", in *Proceedings of Computer Science and Statistics: Twenty-third Sym-posium on the Interface*, ed. E. Keramidas, Wiley, New York, 1991. (With C. Ritter and S. Bisgaard).
"Nonlinear Models" in *Statistical Models in S*, John M. Chambers and Trevor J. Hastie (ed.), Wadsworth, Belmont, CA., 1991 (with John M. Chambers).
"Data Manipulation in Perl", in *Proceedings of Computer Science and Statistics: Twenty-fourth Symposium on the Interface*, ed. J. New-ton, 456–462, Interface Foundation, Fairfax, VA, 1992.
"Teaching the Geometry of Nonlinear Models" in *1993 Proceedings of the Section on Statistical Education*, American Statistical Association, 1993.
"Design Considerations for Nonlinear Calibration" in *1994 Proceedings of the Section on Physical and Engineering Sciences*, American Statistical Association, 1994. (With S. Martin).
"Model Building for Nonlinear Mixed Effects Models" in *1994 Proceedings of the Biopharmaceutical Section*, American Statistical Association, 1994. (With J. Pinheiro and M. Lindstrom).
"Software Design for Longitudinal Data Analysis" in T. Gregoire (ed), *Modelling Longitudinal and Spatially Correlated Data: Methods, Applications, and Future Directions*, Springer-Verlag, 1997. (With J. Pinheiro).
"Graphical Methods for Data with Multiple Levels of Nesting" Joint Statistical Meetings, 1997. (With J. Pinheiro).
"Future Directions in Software for Mixed-Effects Models: Version 3.0 of NLME", International S-PLUS Users' Conference, 1997. (With J. Pinheiro).
"Computing (RE)ML estimates and BLUP's for mixed-effects models", *Proceedings of the First Graybill Conference*, Duxbury, 2002
"Using Open-Source software to teach mathematical statistics", Proceedings of the Joint Statistical Meetings (Statistics Education Section), American Statistical Association, 2001.

Software

R Development Core Team: R-1.6.2 was released on January 10, 2003 representing the culmination of many years of development effort. As an Open Source implementation of the S language, this is widely used is academia and industry.
Omega Development Core Team: Preliminary releases of omega-hat, a distributed statistical computing environment based on the Java language.
NLME: Co-developer of the **NLME-3.3** library for the analysis of lin-ear and nonlinear mixed-effects. The **NLME-3.3** library is now being distributed by MathSoft, Inc. and the **NLME-3.1** library is available for **R**.

Invited presentations

Over 60 invited presentations at meetings, universities, industrial organizations.

Curriculum Vitae of

Christopher H. Fassnacht

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608-265-9300 (fax)

Department of Sociology
University of Wisconsin-Madison
1180 Observatory Drive
Madison, WI 53706
cfassnac@wisc.edu

Educational Background

University of Wisconsin, Madison, Wisconsin

Currently — ABD. Thesis: "The Constitution of Cognition in the Clinic."
Advisor: Prof. Douglas Maynard.

1993-4 — Written preliminary examinations: Social Psychology, Sociology of Science.
Minor Field: Philosophy.

1993 — M.S. in Sociology. Thesis: "Predictivity in Human Interaction: On the Motivation for Attribution, Intersubjectivity, and Social Order."

University of California, Santa Cruz, California

1991 — B.A. in Sociology, with honors in the major and highest college honors.

Publications

STEP Research Group* (2000). "Promoting teachers' flexible use of the learning sciences through case-based problem solving on the WWW: A theoretical design approach." In B. Fishman & S. O'Connor-Divelbiss (Eds.), *Proceedings of the Fourth International Conference of the Learning Sciences*.(pp. 273-279). Mahwah, NJ: Erlbaum. (*Siegel, M., Derry, S., Kim, J.-B., Steinkuehler, C., Street, J., Canty, N., Fassnacht, C., Hewson, K., Hmelo, C., & Spiro, R.).

Jane Zuengler, Cecilia Ford, and Christopher H. Fassnacht (1999), "Analyst Eyes and Camera Eyes: Theoretical and Technological Considerations in 'Seeing' the Details of Classroom Interaction." *Report Series 2.40. National Research Center on English Learning & Achievement.* Albany: University of Albany, State University of New York.

Presentations

Fassnacht, C. (2003). "The Collaborative Production of Cognitive Status in Succedent Settings of the Clinic." International Institute for Ethnomethodology and Conversation Analysis Conference on Producing Local Order. Manchester, UK.

Fassnacht, C. (2003). "From Interaction to Cognition: the Conversational Transformation of Child Testing into Cognitive Ability." Fourteenth Annual Winter Conference on Discourse, Text & Cognition. Jackson Hole, WY.

Fassnacht, C. & Woods, D. "Transana, a Tool for the Transcription and Analysis of Video Data." Workshop on Methods for Studying Interaction. Madison, WI.

Fassnacht, C. (2002). "Second Pair Part Turn Construction and the Inference of Cognitive Ability." Midwest Sociological Society Annual Meeting, Milwaukee, WI.

Derry, S. J., Seymour, J. Feltovich, P., & Fassnacht, C. (2001). "Tutoring and knowledge construction during problem-based learning: An interaction analysis." Annual Conference National Association for Research in Science Teaching (NARST), St. Louis MO.

Derry, S. J., Steinkuehler, C. A., & Fassnacht, C. (2000). "Designing instructional web sites to support inclusive problem-based learning." Annual Conference of the Center for Innovative Learning Technologies (CILT), Washington D. C.

Derry, S.J. & the STEP Research Group* (2000). "Reconceptualizing professional development: Collaborative video projects on the World Wide Web. Annual Meeting of American Educational Research Association, New Orleans, LA." (*P. Feltovich, R. Spiro, C. Hmelo, C. Fassnacht, C. Steinkuehler, J. Street, J.-B. Kim, N. Canty, J. Posselt, J. Lee, B. Beitzel, M. Siegel, J. Seymour, B. Viola, & Y. Lee)

Ford, C. & Fassnacht, C. (1999), "Negation in Turn Construction." Midwest Sociological Society Annual Meeting, Minneapolis, MN.

Fassnacht, C. (1998), "The PALS Project and Measurement." National Center on English Learning and Achievement Mid-Project Review, Albany, NY.

Fassnacht, C. (1998), "Advanced Web Searching Techniques." Wisconsin Center for Education Research Technical Services Seminar, Madison, WI.

Fassnacht, C. (1997), "Cognition-In-Interaction at Sites of Discovery." American Sociological Association Annual Meeting, Toronto, Canada.

Zuengler, J., Ford, C., & Fassnacht, C. (1997), "Data Collection as Theory." National Center on English Learning and Achievement, Center Conference, Madison, WI.

Ford, C. & Fassnacht, C. (1997), "A Conversation Analytic Lens on Discourse in Education." Wisconsin Center for Education Research, Mini-Conference on Classroom Discourse, Madison, WI.

Yamane, D. & Fassnacht, C. (1995), "A Liberal Communitarian Defense of Basic Income," American Sociological Association Annual Meeting, Washington, D.C.

Software

Fassnacht, C. (1995), Creator of "Transana" software for the transcription and analysis of audio/visual data. Currently in production.

Honors and Achievements

1991-95	National Science Foundation Graduate Fellowship.
1992-93	University of Wisconsin, University Fellowship.
1991	Elected to Phi Beta Kappa.
1990-91	University of California, University Scholarship.

Robert S. Glover
Wisconsin Center for Education Research
University of Wisconsin – Madison
1025 West Johnson Street, Madison, WI 53706
608-663-0761
rglover@wisc.edu

Recent Project Experience

Student Indicator Database
SCALE (A project funded by NSF)
November 2003 to Present

Designed and implemented a database on SQL Server 2000 to support longitudinal analysis of student test data and teacher professional development for the NSF funded project SCALE. Responsibilities include development of data cleaning, resolution of conflicting data definitions, and loading of data from four school districts using complex SQL scripts, and overall database administration. Additional deliverables for this project include design and implementation of a data entry application (developed in C#.NET), creation of analysis data sets, and creation of "data marts" that can support "ad-hoc" queries.

Personnel / Project Management Database
WCER
University Wisconsin – Madison
November 2003 to Present

Designed and currently developing a database application that supports the WCER Business Office. This application is being developed with C#.NET and SQL Server 2000 will replace an existing Access database application that manages personnel and project information including project appointments and project funding. Additional deliverables for this project included analysis of the information and technology requirements for the office and integration of disparate data sources into a single application.

Customer Relation Management System
CUNA Mutual Insurance
May 2001 to June 2003
Designed and implemented a custom CRM system utilizing Siebel Corporation's Customer Relation Management System. Customization included design of applets to support specific business needs for CUNA Mutual and implementation of real time data synchronization of a legacy

customer database. The synchronization modules were developed in JAVA and made extensive use of XML messaging and XSL transformations.

Internet Billing System
Alberta Provincial Power
April 2000 – May 2001

Lead developer (as an independent consultant) for an internet based online billing system for electric utilities. This application allowed customers to sign up for automatic billing of utility bills to a credit card or bank account. Responsibilities included database design on Oracle 9i, development of stored procedures, development ASP.NET web pages, and data encryption.

Underwriting Decision Support System
American Family Insurance
November 1996 – April 2000

Lead developer for an underwriting data warehouse used by sales and marketing management to evaluate the sales practices of field agents. This data warehouse was implemented in Oracle 8i and reporting hosted on Business Objects. The database grew to over a terabyte in size within one year. An additional deliverable for this project was an internet base data dictionary which provided real time access to the data warehouse metadata including data sources, definitions, data cleaning rules, and data loading schedules.

Education

Bachelor Science Chemistry
Wake Forest University
May 1977

Certifications

Microsoft Certified Professional Solution Developer

David J. Sleasman

University of Wisconsin-Madison, Wic
(b)(6) *Work: 608•262-2063* *Email: djsleasman@wisc.edu*

EMPLOYMENT HISTORY

Knowledge Manager
SCALE Project, Wisconsin Center for Education Research, Madison WI 1/2004-

Coordinate and lead development of the Vignette Collaboration Server to further partnership communication. Facilitate collaborative work through assisting, coaching, and problem-solving with research staff and faculty. Organize and collect partnership resources and materials within VCBS. Plan and lead development of the system. Develop and conduct training on the system and work to maximize use and implementation across the partnership. Develop strategies and set priorities for development. Coordinate the SCALE partnership Web site. Develop procedures and editorial control for content development of Web site.

Metadata and Cataloging Coordinator
Internet Scout Project, University of Wisconsin-Madison, Madison WI 2/2001-1/2004

Manage the cataloging and classification of Internet resources for Scout Resource Archive in unison with established and emerging bibliographic and metadata standards, specifically Dublin Core Element Set, to insure bibliographic integrity. Coordinate cataloging policy and workflow for ISP initiatives and guide metadata functionality for software development projects. Contribute information management skills, problem-solving and proactive research to the ISP team projects. Lead software quality assurance testing and write software help documentation. Coordinate communication with software beta testers and implementers. Manage projects, train and supervise Project Assistants and interns. Participate in team grant writing and fundraising efforts. Contribute to ISP publications and efforts to inform and educate the education, business and research communities about ISP projects and tools.

Cataloging/Reference Librarian
Madison Area Technical College Library, Madison WI 5/1999-1/2001

Catalog and classify audio-visual and electronic resources. Coordinate Reference Collection resources and management. Provide Reference and research assistance to students, faculty and staff. Select print and WWW resources in assigned subject areas. Formally and informally instruct on the use of information technology and library resources. Develop pathfinders, instructional help and bibliographies. Develop and maintain excellent working relationships with faculty. Research and coordinate use of electronic database products. Resolve service issues with electronic resource vendors.

Committees: Webpage Management Team, Cataloging Team, Renovation planning, Library Instruction Team
Selection areas: Visual Arts, Architecture, Social Sciences, Economics, Psychology, and Philosophy

Reference Librarian
Hedberg Public Library, Janesville WI 5/1996-5/1999

Provide reference and reader's advisory services. Instruct on the use of the library's materials and equipment, information technology and the Internet. Coordinate selection and review of electronic reference products. Assist in training staff members on new or evolving electronic products. Participate in planning and policy development of the Reference Department especially for electronic resources. Select and manage print and sound recording collections in assigned subject areas. Oversee and maintain the local history collection. Coordinate with the Computer Manager to assure good quality public and staff service and problem resolution for equipment, software and electronic reference products.

Committees: Collection Development Team, Technology Management Team, Webpage Advisory Committee
Selection areas: Art, Architecture, Film, Classical Music and Opera, Economics, Psychology, Local History, Philosophy

Assistant Curator
Special Collections Dept., University of Pittsburgh Libraries, Pittsburgh PA 3/1989-10/1995

Provide reference service for the Special Collections Department and the Archives Service Center. Organize acquisitions and develop automated/traditional access tools in accordance with national standards. Oversee maintenance, preservation and rehabilitation of the collection. Curate exhibitions of books, prints, and ephemera and install other departmental exhibits. Train/Supervise student assistants. Write articles about the Department's exhibitions, collections and activities. Instructor for training workshops.

Committees: Director's Advisory Council, Archives Automation Working Group, and Archives Automation Committee
Selection areas: Performing Arts archives, papers, prints, and emphemera

Library Specialist II
Frick Fine Arts Library, University of Pittsburgh Libraries, Pittsburgh, PA 12/87-3/89

Provide reference service for Art, Architecture and related topics to faculty, graduate and undergraduate students. Manage reserve book/periodical collection. Receipt, binding and maintenance of periodicals. Train and supervise student assistants.

RELATED WORK EXPERIENCE

Brodart Automation 4/2000-6/2001
Brodart Inc., Williamsport PA (Part-time)
Customized free-lance MARC cataloging of World Wide Web resources.

Brodart Automation 4-5/2000
Brodart Inc., Williamsport PA (Part-time)
Customized free-lance MARC cataloging of World Wide Web resources.

Business, Industry, and Community Instruction 6/1999-1/2001
Madison Area Technical College, Madison WI (Part-time)
Develop curriculum and instruct on the use of the World Wide Web as a research tool.

EDUCATION

1995 University of Pittsburgh, School of Library and Information Science • M.L.S.
1987 University of Pittsburgh • B.A. Psychology/Economics

PUBLICATIONS

Bower et al. Internet Scout Project's Metadata Management Experience. In D. Hillman and E.Westbrooks (Eds) *Metadata in Practice: A Work in Progress* (Spring 2004)

Almasy et al. Software *for Building a Full-Featured Discipline-Based Web Portal: The Scout Portal Toolkit*, D-Lib Magazine (Nov. 2002)
<http://www.dlib.org/dlib/november02/almasy/11almasy.html>

PRESENTATIONS

6/2002 Scout Portal Toolkit as part of a LITA panel at American Library Association meeting on WWW portal development
5/2000 Using the Internet for Research: A workshop for K-12 Teachers and Educators.

5/2000	Finding images and sounds on the WWW: Workshop for MATC Tech Academy
6/1999	Using the Internet for Research: A workshop for K-12 Teachers and Educators.
1998-99	Monthly instructional training for HPL staff on the use of new electronic reference tools.
9/1998	What's This Book Worth?: Book collecting workshop for the HPL Friends of the Library.
6/1997	Wacky World of the Internet: for the HPL Youth Services Department

EXHIBITIONS

2002 & 2003	Exhibitor at annual Wisconsin Libraries Association Conference
5-9/1994	Andy Warhol and His Social Circle in Print, Univ. of Pittsburgh Libraries.
3-4/1993	20th Century Japanese Prints from the Leuba Collection, Univ. of Pittsburgh Libraries.
5-9/1992	The North American Indian Portraits by E.S. Curtis, Univ. of Pittsburgh Libraries.

RECENT CONFERENCES AND WORKSHOPS

6/2004	Javascript Workshop, DoIT, Madison WI
10/2003	Annual Dublin Core Conference and Workshops, Seattle WA
12/2002	National Science Foundation NSDL All Grantees Meeting, Washington, DC
6/2002	American Library Association Conference, Atlanta GA
3/2002	ALCTS AACR2 and Metadata Regional Institute, San Diego CA
1/2002	ALA Midwinter Conference, New Orleans LA
12/2001	National Science Foundation NSDL All Grantees Meeting, Washington, DC
10/2001	NSLS Open Source Library Software Symposium, Chicago IL
6/2001	American Library Association Conference, San Francisco CA
6/2000	XML, University of Wisconsin DoIT workshop, Madison WI
10/2000	Metadata: Workshop on Cataloging Electronic Resources, UW-Extension, Madison WI

PERIODICAL AND REFERENCE DATABASE EXPERTISE

ABInform, Academic Search, Academic Universe Web, ACM Digital Library, Agricola, Art Index, Biography and Genealogy Master Index, Biological Abstracts, Contemporary Authors, Contemporary Literary Criticism, Cinahl, Emerald, ERIC, Ethnic Newswatch, ERIC, Genderwatch, Government Periodicals Universe, Health Reference, JSTOR, LEXIS/NEXIS, MEDLINE, Newsbank Infoweb, LDS FamilySearch, New York Times, Proquest Newspapers, PsycINFO, ScienceDirect, Statistical Universe, WISLAW

CATALOGING EXPERTISE

Metadata formats:	MARC, MARC-AMC and DC, and GEM
Classification schemas:	Dewey Decimal and Library of Congress.
Subject headings:	Library of Congress Subject Headings
Tools:	Subject Cataloging Manual, AACR2, LCRI, APPM, Art and Architecture Thesaurus, National Union Catalog of Manuscript Collections, Getty Union List of Artists Names, Getty Thesaurus of Geographic Names, NACO, Chicago Manual of Style, ERIC Thesaurus of Descriptors
Online catalogs	Sirsi, Notis, Brodart, and Dynix.
Bibliographic utilities	OCLC, RLIN, and WISCAT.
Knowledge Management	Vignette Collaboration Server

JULIE K. UNDERWOOD

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Junderwood@nsba.org

FORMAL EDUCATION

1984	University of Florida, Gainesville, FL	Ph.D.
1979	Indiana University, Bloomington, IN	J.D.
1976	DePauw University, Greencastle, IN	B.A.

ADMITTED TO BAR

U.S. Supreme Court	1998
Eleven of the Thirteen U.S. Circuit Courts of Appeals	1998/1999
Wisconsin	1991
Florida	1982
Indiana	1979

EMPLOYMENT HISTORY

2005-Present **Dean,** School of Education, University of Wisconsin-Madison

1998 – 2005 **Associate Executive Director and General Counsel**. National School Boards Association.

1995 – 1998 **Dean**. School of Education & Allied Professions, Miami University.

1988 – 1998 **Attorney**. Friedman Law Firm

1986 – 1995 **Faculty**. University of Wisconsin, Madison. Teaching school law courses.
- 1994-1995 **Associate Dean**. School of Education. Responsibilities primarily included working with the University Attorney and Office of Affirmative Action on all legal concerns for the School of Education.
- 1993-1994 **Chair**. Department of Educational Administration.
- 1990-1995 **Professor**. Department of Educational Administration.
- 1990-1993 **Co-Director**. Wisconsin Center for Education Policy, Robert M. LaFollette Institute of Public Affairs.
- 1986-1989 **Assistant Professor**. Department of Educational Administration.

1988 – 1995 **Attorney**. Wisconsin Department of Public Instruction.

1982 – 1986 **Faculty**. University of North Dakota. Teaching school law, school finance and education policy.
- 1986 **Assistant Dean**. Center for Teaching and Learning.
  Assistant Professor. Educational Administration.

1981 - 1982 **Research Associate**. University of Florida. Institute for Educational Finance.
Instructor. School of Law. Teaching legal research and writing.

BOOKS

Underwood J., & Webb L. (in press). School Law for Teachers. Columbus, OH: Prentice Hall.

Underwood, J. (2005, 2003). No Child Left Behind Resource Documents. Alexandria, VA: Council of School Attorneys National School Boards Association.

Underwood, J., & Mead, J. (1995). Legal aspects of special education and pupil services. Needham Heights, MA: Allyn & Bacon.

Camp, W., Underwood, J., Connelly, M., & Lane, K. (Eds.). (1993). The principal's legal handbook. Topeka, KS: National Organization on Legal Problems of Education.

Underwood, J., & Verstegen, D. (Eds.). (1990). The impact of litigation and legislation on public school finance. New York, NY: Harper & Row Publishing Co.

Camp, W., Underwood, J., & Connelly, M. (Eds.). (1989). Principals' handbook: Current issues in school law. Topeka, KS: National Organization on Legal Problems of Education.

Monk, D., & Underwood, J. (Eds.). (1988). Microlevel school finance: Issues and implications for policy. Cambridge, MA: Ballinger Publishing Company.

RECENT CHAPTERS IN BOOKS

Underwood, J. (2004). Foreword in Hanks, J. School Violence: From Discipline to Due Process. Chicago, IL: American Bar Association Publishing.

Underwood, J. (2004). The Unfulfilled Promise of *Brown v. Board of Education.* In Council of Attorneys, School Law In Review. Alexandria, VA: National School Boards Association.

Underwood, J. (2003). Supreme Court Update. In Council of School Attorneys, School Law In Review. Alexandria, VA: National School Boards Association.

Underwood, J. (2003). The Legal System. In Council of School Attorneys, Understanding & Limiting School Board Member Liability. Alexandria, VA: National School Boards Association.

Underwood, J. (2002). Supreme Court Update. In Council of School Attorneys, School Law In Review. Alexandria, VA: National School Boards Association.

Underwood, J. (2001). Choice, The American Common School, and Democracy. In R. Soder, J. Goodlad & T. McMannon (Ed.), Developing Democratic Character in the Young. San Francisco, CA: Jossey-Bass.

Underwood, J., and Verstegen, D. (1990). School finance challenges in federal courts: Changing equal protection analysis. In J. Underwood and D. Verstegen (Eds.), The impact of litigation and legislation on public school finance. New York, NY: Harper & Row Publishing Co.

Underwood, J. (1990). State legislative responses to educational reform literature. In Paul Thurston (Ed.), Advances in educational administration. Greenwich, CT: JAI Press, Inc.

RECENT ARTICLES

Underwood, J. (2004). Off-Campus Behavior: Are Your Hands Tied? Principals' Leadership, 4 (1)

Smith, S., J.L. Myers, & Underwood J. (2003). "Blowing In the Wind". American School Board Journal, (18).

Underwood, J. (2002, August/September). Supreme Court News: Final Opinions Issued. Inquiry & Analysis.

Underwood, J. & Stainback, J. (2002, July). Private Funding of School Construction. Inquiry & Analysis.

Underwood, J. (2001, October). Facilities Use after *Good News v. Milford.* Inquiry & Analysis.

Underwood, J. (2001, May). Graduation Issues. Inquiry & Analysis.

Mead, J., & Underwood J. (2001). *Lemon* Distilled With Four Votes for Vouchers: An Examination of *Mitchell v. Helms* and its Implications. Education Law Reporter, 149 (3).

Russo, C., Underwood, J., & Cambron-McCabe, N. (2000). The Top Ten Education Law Cases: The Supreme Court's Impact on Schooling. International Journal of Educational Reform, 9 (1).

Underwood, J. (1995). School finance adequacy as Vertical Equity. University of Michigan Journal of Law Reform, 28 (3).

Underwood, J., & Meredith, B. (1995). Irreconcilable differences? Defining the rising conflict between regular and special education. Journal of Law and Education. 24 (2).

Underwood, J. (1994). School finance litigation: Legal theories, judicial activism, and social neglect. Journal of Education Finance, 20 (2).

Underwood, J., & Sparkman, W. E. (1991). School finance litigation: A new wave of reform. Harvard Journal of Law and Public Policy, 14 (2).

Underwood, J. (1990). Changing establishment analysis within and outside the context of education. Howard Law Journal, 33 (1).

Underwood J. (1989). Changing equal protection analyses in finance equity litigation. Journal of Education Finance, 14(3), 413-425.

SELECTED RECENT PRESENTATIONS

Underwood, J. (2004, November). Supreme Court Update. Education Law Association's 50th Annual Conference, Second General Session, Tucson, Arizona.

Underwood, J. (2004, March). Supreme Court Update and National Legal Trends. National School Boards Association's 64th Annual Conference, Orlando, Florida.

Underwood, J. (2004, October). An Exploration of Recent Decisions from the State and Federal Courts Affecting Public Schools. NSBA's Council of School Attorneys' 2004 Advocacy Seminar, Savannah, Georgia.

Underwood, J. (2002, August). Special Education. Oxford Roundtable on Special Education. St. Antony's College, Oxford University, England.

Underwood, J. (2000, July). Providing Children Education to Participate in a Democracy. Oxford Round Table on Education Policy Public School Law, St. Antony's College, Oxford University, England.

GRANT APPLICATIONS

Underwood, J., Search and Seizure: An Analysis of Developing Legal Standards in the Education Context. Funded by the University of Wisconsin Graduate School, $7,788.88 (duration June 1, 1989, to August 1, 1989).

Underwood, J., Establishment of Religion: An Investigation of Possible Changes in Standards and Application. Funded by the University of Wisconsin Graduate School, $7, 598.00 (duration June 1, 1988, to August 1, 1988).

Lufler, H., and Underwood, J., The Development and Implementation of a Model Program for Disseminating Law-Related Education in Wisconsin Public Schools. Submitted December 16, 1987, to U.S. Department of Education, $87,293.

Lufler, H., and Underwood, J., A Program to Institutionalize Law-Related Education in Wisconsin. Submitted April 22, 1987, to U.S. Department of Education, $86,749.

RECENT NATIONAL PROFESSIONAL SERVICE

2000 - Present	Member, National Policy Board of Educational Administration (current chair)
2000 - Present	Executive Board Member, National Council for the Accreditation of Teacher Education
1999 - 2004	Board Member, Institute for Educational Inquiry
1995 - Present	Editorial Advisory Board, Education Law Reporter

Adam Gamoran
Department of Sociology
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Madison, WI 53706
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Education

A.B., Near Eastern Languages and Civilizations, University of Chicago, 1979
A.M., Social Sciences, University of Chicago, 1979
Ph.D., Education, University of Chicago, 1984

Positions Held (last five years)

Director, Wisconsin Center for Education Research, University of Wisconsin-Madison, 2004-present
Chair, Department of Sociology, University of Wisconsin-Madison, 2001-2004
Assistant to Associate to Professor of Sociology and Educational Policy Studies, University of Wisconsin-Madison, 1984-present

Research and Training Support (last five years)

"Interdisciplinary Training Program for Predoctoral Research in Education Sciences." Institute of Education Sciences, U.S. Department of Education, $5,000,000, 8/05-7/10.
"Long-term Effects of School Desegregation." Subcontract with Vanderbilt University to the Institute for Research on Poverty, funded by the William T. Grant Foundation, $154,699, 9/01-8/04.
"Analysis of Chicago Jewish Schools Pilot Study Data." Subcontract with the Center on Public and Private Schools, University of Notre Dame, funded by the U.S. Department of Education, $51,540, 9/02-8/03.
"Spencer Mentor Award." The Spencer Foundation, $50,000, 3/99-8/02.
"Discourse Environment and Student Achievement" (with Martin Nystrand and Lawrence Wu) and "Cross-Site Analyses" (with Arthur Applebee, Judith Langer, and Martin Nystrand). Center on English Learning and Achievement, Office of Educational Research and Improvement, $495,791, 3/96-2/01. Extension, "Evaluation of the Partnership for Literacy," $600,000, 3/01-2/03.
"Organizational Capacity to Support Classrooms that Promote Understanding" (with Cora Marrett, Walter Secada, and William Tate). National Center on Improving Student Learning and Achievement in Mathematics and Science, Office of Educational Research and Improvement, $836,319, 3/96-2/01. Extension, "Cross-Site Analyses of District and School Contexts," $140,000, 3/01-2/03.

Honors

Member, Sociological Research Association, elected 2002
Member, National Academy of Education, elected 2001

Mentor Award, The Spencer Foundation, 1999-2001
Mandel Fellow, Mandel Institute, Jerusalem, Israel, 1998
Fulbright Scholar, United Kingdom, 1992-1993
Spencer Fellow, National Academy of Education, 1989-1990
Citation for Excellence in Teaching, Department of Sociology, University of Wisconsin, Madison, 1989
Outstanding Dissertation Award, Division G, American Educational Research Association, 1985
Phi Beta Kappa, elected 1979

Editorial and Advisory Activities (last five years)

Editorial Board Member, *Educational Evaluation and Policy Analysis*, 2003-present
Editorial Board Member, *Educational Researcher*, 2001-03
Editorial Board Member, Teacher's College Press series in Sociology of Education, 1992-present
Editorial Board Member, *Sociology of Education*, 1987-92 and 1996-99
Review Coordinator, Report on State Science Assessments, National Research Council, National Academy of Sciences, 2004-2005
Review Coordinator, Report on Quality of K-12 Curricular Evaluations, National Research Council, National Academy of Sciences, 2003-2004
Committee on Talking it Through: Cross-National Conversations about Secondary Mathematics Curricula, National Research Council, National Academy of Sciences, 2002-03
Committee on A Framework and Long-Term Research Agenda for International Comparative Education Studies, National Research Council, National Academy of Sciences, 2002-03
Board on International Comparative Studies of Education, National Research Council, National Academy of Sciences, 1998-03
Technical Working Group, Evaluation of the Magnet Schools Assistance Program, U.S. Department of Education, 1998-02
Dissertation Fellowship Selection Committee, The Spencer Foundation, 1998-00
Technical Review Panel, NELS Fourth Follow-Up, U. S. Department of Education, 1998-00

Publications (recent and selected)

Books

Gamoran, Adam, Charles W. Anderson, Pamela Anne Quiroz, Walter G. Secada, Tona Williams, and Scott Ashmann. 2003. *Transforming Teaching in Math and Science: How Schools and Districts Can Support Change.* New York: Teachers College Press.

Hallinan, Maureen T., Adam Gamoran, Warren Kubitschek, and Tom Loveless, Editors. 2003. *Stability and Change in American Education: Structure, Process, and Outcomes.* Clinton Corners, NY: Eliot Werner Publications.

Porter, Andrew C., and Adam Gamoran, Editors. 2002. *Methodological Advances in Cross-National Surveys of Educational Achievement.* Washington, DC: National Academy Press.

Articles and Chapters

Gamoran, Adam. 2004. Classroom organization and instructional equity. Pp. 141-155 in M. C. Wang and H. J. Walberg (Eds.), *Can unlike students learn together? Grade retention,*

tracking, and grouping, Greenwich, CT: Information Age Publishing, pp. 141-155 (2004).

Applebee, Arthur N., Judith Langer, Martin Nystrand, and Adam Gamoran. 2003. "Discussion-Based Approaches to Developing Understanding: Classroom Instruction and Student Performance in Middle and High School English." *American Educational Research Journal, 40, 685-730.*

Gamoran, Adam. 2002. "Beyond Curriculum Wars: Content and Understanding in Mathematics." Pp. 134-162 in T. Loveless (Ed.), *The Great Curriculum Debate: How Should We Teach Reading and Math?* Washington, DC: Brookings.

Lucas, Samuel R., and Adam Gamoran. 2002. "Track Assignment and the Black-White Test Score Gap: Divergent and Convergent Evidence from 1980 and 1990 Sophomores." Pp. 171-198 in T. Loveless (Ed.), *Closing the Gap: Promising Strategies for Reducing the Achievement Gap.* Washington, DC: Brookings.

Carbonaro, William J., and Adam Gamoran. 2002. "The Production of Achievement Inequality in High School English." *American Educational Research Journal, 39*, 801-827.

Ehrenberg, Ronald G., Dominic J. Brewer, Adam Gamoran, and J. Douglas Willms. 2001. "Does Class Size Matter?" *Scientific American, 285*, 32-40.

Gamoran, Adam. 2001. "American Schooling and Educational Inequality: Forecast for the 21st Century." *Sociology of Education, 34* (Extra Issue), 135-153.

Gamoran, Adam, Walter G. Secada, and Cora B. Marrett. 2000. "The Organizational Context of Teaching and Learning: Changing Theoretical Perspectives." Pp. 37-63 in M. T. Hallinan (Ed.), *Handbook of the Sociology of Education.* New York: Kluwer Academic/Plenum.

Gamoran, Adam, and Eileen C. Hannigan. 2000. "Algebra for Everyone? Benefits of College-Preparatory Mathematics for Students with Diverse Abilities in the Early Secondary School." *Educational Evaluation and Policy Analysis, 22*, 241-254.

Gamoran, Adam. 2000. "High Standards: A Strategy for Equalizing Opportunities for Learning?" Pp. 93-126 in R. D. Kahlenberg (Ed.), *A Notion at Risk: Preserving Public Education as an Engine for Social Mobility.* New York: The Century Foundation.

Gamoran, Adam, and Matthew Weinstein. 1998. "Differentiation and Opportunity in Restructured Schools." *American Journal of Education, 106*, 385-415.

Gamoran, Adam, Andrew C. Porter, John Smithson, and Paula A. White. 1997. "Upgrading High School Mathematics Instruction: Improving Learning Opportunities for Low-Income, Low-Achieving Youth." *Educational Evaluation and Policy Analysis, 19*, 325-338.

Gamoran, Adam. 1996. "Student Achievement in Public Magnet, Public Comprehensive, and Private City High Schools." *Educational Evaluation and Policy Analysis, 18*, 1-18.

Gamoran, Adam. 1992. "The Variable Effects of High School Tracking." *American Sociological Review, 57*, 812-828.

Gamoran, Adam, and Robert D. Mare. 1989. "Secondary School Tracking and Educational Inequality: Compensation, Reinforcement, or Neutrality?" *American Journal of Sociology, 94*, 1146-1183.

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University of Wisconsin-Madison
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E-mail: dmbolt@facstaff.wisc.edu

Education

Ph.D.	University of Illinois at Urbana-Champaign Psychology (Quantitative Methods)	1999
M.S.	University of Illinois at Urbana-Champaign Statistics	1995
B.A.	Calvin College Psychology/Mathematics	1992

Positions Held

2004-present	Associate Professor, Department of Educational Psychology, Division of Quantitative Methods, University of Wisconsin-Madison Affiliate Faculty, Department of Psychology
1999-2004	Assistant Professor, Department of Educational Psychology, Division of Quantitative Methods, University of Wisconsin-Madison Affiliate Faculty, Department of Psychology (2000-)

Honors and Awards

Jason Millman Promising Scholar Award, awarded by the National Council on Measurement in Education (NCME) in recognition of scholarly research in the field of applied measurement during the early stages of career, April, 2003

Maurice Tatsuoka Scholar, University of Illinois at Urbana-Champaign, 1997-1998

Research Publications (Articles and Chapters)

Bolt, D.M. & Kim, J-S. (in press). Hierarchical IRT modeling. In B. Everitt & D. Howell (Eds.), Encyclopedia of statistics in the behavioral sciences. Wiley.

Bolt, D.M. (in press). Limited and full-information IRT estimation. In A. Maydeu- Olivares and J. McArdle (Eds.), Contemporary Psychometrics: A Festschrift to Roderick P. McDonald. Lawrence-Erlbaum.

Bolt, D.M. (in press). Analyzing the Psychopathy Checklist-Revised (PCL-R) using factor analysis and item response theory: Overview and recent advances. In J.Yuille & H. Herve (Eds.) Psychopathy in the Third Millennium: Theory and Research. Lawrence Erlbaum.

Vitale, J.E., Newman, J.P., Serin, R.C., & Bolt, D.M. (in press). Hostile attributions in incarcerated male offenders: An exploration of diverse pathways. Aggressive Behavior.

Li, Y.M., Bolt, D.M. & Fu, J.B. (in press). A test characteristic curve linking method for the testlet model. Applied Psychological Measurement.

Cohen. A.S., & Bolt, D.M. (in press). A mixture model analysis of differential item functioning. Journal of Educational Measurement.

Kim,D.M. Wampold, B.E. & Bolt, D.M (in press). Therapist effects in psychotherapy: Random effects modeling of the NIMH TDCRP data. Psychotherapy Research.

Ysseldyke, J., Thill, T, Pohl, J., & Bolt, D. (in press). Using MathFacts in a Flash to enhance computational fluency. Journal of Evidence Based Practices in Schools.

Bolt, D.M., Hare, R.D., Vitale, J., & Newman, J. (2004). A multigroup item response theory analysis of the Psychopathy Checklist-Revised (PCL-R). Psychological Assessment, 16, 155-168.

Piper, M.E., Felderman, E.B., Piasecki, T.M., Bolt, D.M., Smith, S.S., Fiore, M.C., & Baker, T.B. (2004). A multiple motives approach to tobacco dependence: The Wisconsin Inventory of Smoking Dependence Motives (WISDM). Journal of Consulting and Clinical Psychology, 72, 139-154.

Bolt, D.M. & Lall, V.F. (2003). Estimation of compensatory and noncompensatory multidimensional IRT models using Markov chain Monte Carlo. Applied Psychological Measurement, 27, 395-414.

Hudmon, K.S., Marks, J.L., Pomerleau, C.S., Bolt, D.M., Brigham, J., & Swan, G.E. (2003). A multidimensional model for characterizing tobacco dependence. Nicotine and Tobacco Research, 5, 655-664.

Begun, A L., Murphy, C., Bolt, D., Short, L., Strodthoff, T., Weinstein, B., Shelley, G.(2003). Characteristics of the Safe-at-Home Instrument for assessing readiness to change intimate partner violence. Research in Social Work Practice, 13, 80-107.

Bolt, D.M., Cohen, A.S., & Wollack, J.A. (2002). Item parameter estimation under conditions of test speededness: Application of a mixture Rasch model with ordinal constraints. Journal of Educational Measurement, 39, 331-348.

Wollack, J.A., Bolt, D.M., Cohen, A.S., & Lee,Y-S. (2002). Recovery of item parameters in the nominal response model: A comparison of marginal maximum likelihood estimation and Markov chain Monte Carlo estimation. Applied Psychological Measurement, 26, 337-350.

Bolt, D.M. (2002). A Monte Carlo comparison of parametric and nonparametric polytomous DIF detection methods. Applied Measurement in Education, 15, 113-142.

Bolt, D.M., Cohen, A.S., & Wollack, J.A. (2001). A mixture item response model for multiple-choice data. Journal of Educational and Behavioral Statistics, 26, 381-409.

Bolt, D.M. (2001). Conditional covariance-based representation of multidimensional test structure. Applied Psychological Measurement, 25, 244-257.

Gierl, M.J. & Bolt, D.M. (2001). Illustrating the use of nonparametric regression to assess differential item and bundle functioning across multiple groups. International Journal of Testing, 3&4, 249-270.

Bolt, D.M. (2000). A SIBTEST approach to testing DIF hypotheses using experimentally designed test items. Journal of Educational Measurement, 37, 307-327.

Bolt, D.M. & Rounds, J. (2000). Advances in psychometric theory and methods. In S.D Brown & R.W. Lent (Eds.), Handbook of Counseling Psychology (pp. 140-176). New York: John Wiley & Sons.

Bolt, D.M. (1999). Evaluating the effects of multidimensionality on IRT true-score equating. Applied Measurement in Education, 12, 383-406.

McDonald, R.P. & Bolt, D.M. (1998). The determinacy of variables in structural equation models. Multivariate Behavioral Research, 33, 385-401.

Stout,W., Li, H., Nandakumar, R., & Bolt, D. (1997). MULTISIB: A procedure to investigate DIF in intentionally two-dimensional data. Applied Psychological Measurement, 21, 195-213.

Bolt, D. & Stout, W. (1996). Differential item functioning: Its multidimensional model and resulting SIBTEST detection procedure. Behaviormetrika, 23, 67-95.

Shoemaker, A. & Bolt, D.M. (1992). Computer measurement of the autokinetic effect. Perceptual and Motor Skills, 75, 771-777.

Editorial and Advisory Activities

Consulting Editor, Journal of Abnormal Psychology (2004-present)

Ad Hoc Journal Reviewer: Applied Psychological Measurement, Cognition and Instruction, Journal of Educational Measurement , Journal of the American Statistical Association, Journal of Abnormal Psychology, Journal of Personality and Social Psychology, Psychological Methods, Psychological Assessment, Psychometrika, Review of Educational Research, Review of Research in Education, Structural Equation Modeling

Conference Review: Reviewer of paper proposals, American Educational Research Association (AERA) and National Council on Measurement in Education (NCME) Annual meetings (2000-present), Reviewer of NCME training program proposals (2002)

Grant Review: Reviewer of National Institute of Mental Health (NIMH), National Institute of Health (NIH) proposals, 2003-present.

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Education Leadership & Policy Analysis
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Web: http://www.education.wisc.edu/elpa/people/faculty/camburn.html

Education

1997 University of Chicago: Ph.D. Education; Program in Measurement, Evaluation, and Statistical Analysis;
1989 University of Chicago: M.A. Social Science Divisional Masters Program
1983 Illinois Benedictine College: B.A. Sociology

Professional Experience

2004-Present	Assistant Professor, Educational Leadership and Policy Analysis, University of Wisconsin-Madison
2003	Instructor, College of Education, Educational Administration Department, Michigan State University
1997 - 2004	Assistant Research Scientist, School of Education, University of Michigan; Associate Director of Survey Studies, Study of Instructional Improvement
1991 - 1997	Research Associate, Consortium on Chicago School Research, University of Chicago
1993 – 1994	Teaching Assistant, Department of Education, University of Chicago.
1987 - 1991	Assistant Survey Director, NORC, University of Chicago
1986 – 1987	Research Assistant, Metropolitan Opportunity Project, University of Chicago
1984 – 1986	Senior Research Analyst, Procter and Gamble Account, Market Facts

Other Professional Experience

Editorial Board Member: Educational Administration Quarterly (2004-2005)
Reviewer: American Educational Research Association Divisions A and D; American Educational Research Association Special Interest Groups on Survey Research, School Climate and Effectiveness, and Workplace Learning; American Educational Research Journal; American Journal of Education; Educational Evaluation and Policy Analysis; Journal of Education of Students Placed at Risk; Sociology of Education; Teachers College Record.
Consultant: National Catholic Education Association, National Opinion Research Center, North Central Regional Educational Laboratory, National Clearinghouse for Comprehensive School Reform
Section Chair: AERA Annual Meeting 2003, School improvement section of Division A (Educational Administration).
Member: University of Michigan Behavioral Sciences Institutional Review Board (2003-2004)

Academic Awards and Distinctions

2002	William J. Davis Memorial Award for the most outstanding article in Vol. 35 of the journal Educational Administration Quarterly. 2000.
1991 – 1994	Century Scholarship. University of Chicago

Grants and Funded Projects

2004-2006	Atlantic Philanthropies. *Instructional Improvement Through Comprehensive School Reform: Investigations From the Study of Instructional Improvement.* Principal Investigator. ($214,866)
2004-2007	U.S. Department of Education. *Assessing the Impact of Principals' Professional Development: An Evaluation of the National Institute for School Leadership.* Co-principal Investigator. ($374,566)
1999-2000	American Institutes for Research in the Behavioral Sciences (Educational Statistics Service Institute): *Development of an instructional log.* Co-principal investigator. ($50,000).
1995	University of Chicago School Math Project *Examining connections between professional community, teacher learning, and instruction.* Principal investigator. ($17,000).
1988	NORC (NORC Director's Grant). *Refining the High School and Beyond urbanicity measures.* ($2,000).

Publications

Camburn, E., and Barnes, C. (2004). *Assessing the validity of a language arts instruction log through triangulation.* Elementary School Journal, 105, 49-74.

Rowan, B., Camburn, E., & Barnes, C. (2004). *Benefiting from comprehensive school reform: A review of research on CSR implementation.* In C. Cross (Ed.), Putting the pieces together: Lessons from comprehensive school reform research (pp. 1-52). Washington, DC: National Clearinghouse for Comprehensive School Reform.

Rowan, B., Camburn, E., and Correnti, R. (2004). *Using teacher logs to measure the enacted curriculum: A study of literacy teaching in third-grade classrooms.* Elementary School Journal, 105, 75-102.

Camburn, E., Rowan, B., and Taylor, J. (2003). *Distributed Leadership in Schools: The Case of Elementary Schools Adopting Comprehensive School Reform Models.* Educational Evaluation and Policy Analysis. 25(4), 347-373.

Bryk, A., Camburn, E., and Seashore Louis, K. (1999). *Professional community in Chicago elementary schools: Facilitating factors and organizational consequences* Educational Administration Quarterly. 35 (Supplement, December), 751-781.

Roderick, M., and Camburn, E. (1999). *Risk and recovery from course failure in the early years of high school.* American Educational Research Journal. 36(2).

Camburn, E. (1990). *College completion among students from high schools located in large metropolitan areas.* American Journal of Education. 98(4).

Ball, D.L., Camburn, E., Correnti, R., Phelps, G., Wallace, R. (1999). *New Tools for Research on Instruction and Instructional Policy: A Web-based Teacher Log.* Center for the Study of Teaching and Policy (CTP), University of Washington. CTP working paper W-99-2.

Bryk, A., Camburn, E., and Seashore Louis, K. (1997). *Professional Community in Chicago Elementary Schools: Facilitating Factors and Organizational Consequences. Revised. Final Deliverable to OERI.* Office of Educational Research and Improvement (ED), Washington, DC. Wisconsin Center for Education Research, Madison.

Roderick, M., and Camburn, E. (1996). Academic difficulty during the high school transition. In *Charting reform: The students speak.* Chicago: The Consortium on Chicago School Research.

Green, P.J., Dugoni, B.L., Ingels, S.J., and Camburn, E. (1995). *A profile of the American high school senior in 1992.* Washington D.C.: National Center for Education Statistics. NCES 95-384.

Sebring P.A., and Camburn, E. (1992). A profile of eighth graders in Catholic schools: Based on the National Educational Longitudinal Study of 1988. Washington D.C.: National Catholic Education Association.

List of papers in press, under review and presented at conferences available upon request

Professional Affiliations

American Association of Public Opinion Researchers
American Educational Research Association
American Educational Research Association, Special Interest Group on Survey Research

H. Gary Cook

(b)(6)

Education

May 2001 — Ph.D., Educational Measurement, Evaluation and Research Design, Michigan State University

June 1990 — MA, Teaching English as a Second Language (TESOL), University of Hawai'i at Manoa

June 1988 — BA, Linguistics, University of Hawai'i at Manoa

Positions Held

January 2005 to present

Research Scientist

Wisconsin Center for Educational Research. Function as an embedded researcher and manage Milwaukee Pubic School's research and evaluation process. Provide policy research and program evaluation consultation and services for training staff within the Milwaukee Public Schools in advanced statistics for the Value-Added Research at Milwaukee Public Schools project.

June 2002 to December 2004

Vice President of State Accounts

Harcourt Assessment, Inc. Direct and manage company's State-level National Measurement Consultants. Provide leadership role and national strategy for winning and expanding statewide assessment accounts. Provide psychometric and statistical support for state clients as well as organizing support for regional Vice Presidents and Measurement Consultants. Provide expert advice regarding state and federal legislation, especially as it relates to the No Child Left Behind Act of 2001. Represent Harcourt at regional and national meetings, conferences and organizations.

October 1998 to June 2002

Director, Office of Educational Accountability

Wisconsin Department of Public Instruction. Direct the development, administration, scoring, reporting and management of the state of Wisconsin's public school assessment programs. Responsible for the supervision of 17 professional assessment staff members as well as the management of a $5 million annual state assessment budget.

August 1990 to 1998

Testing Coordinator

English Language Center, Michigan State University (MSU). Responsible for the development and administration of the English language testing program and consult in English language research at MSU.

August 1990 to 1998

Specialist

English Language Center, MSU. Responsible for curriculum development, in additional responsible to teach advanced English for academic purposes preparation courses for incoming international students at MSU.

August 1992 to Present

Educational Research Consultant
Measurement Plus+, Lansing, MI. Owner and chief consultant. Work with secondary and post-secondary institutions in the areas of measurement, program evaluation and research with specialty areas in large-scale state assessment, English language learner assessment, and special education assessment. Clients have been Ferris State University, Princeton University, University of Michigan, Central Michigan University, University of Detroit, Lansing Community College.

August 1989 to June 1990

Testing Coordinator
English Language Institute, University of Hawai'i at Manoa. Responsible for the supervision, administration and development of the English language testing program at the English Language Institute.

August 1989 to June 1990

Writing Instructor
English Language Institute, University of Hawai'i at Manoa.

June 1988 to August 1989

ESL Instructor
Pacific International Language School, McKinley High School, and New Intensive Course in English (N.I.C.E.) Program, Honolulu Hawai'i.

Grant Awards

October 2004 to September 2005

Hawaii Alternate Assessment Development
Co-principle investigator of an Office of Special Education Programs grant to develop the state's special education alternate assessment system. Grant value $411,000.

Publications

Cook, H.G. (2005). Alignment Study: South Dakota's English Language Proficiency Standards for English Language Learners K-12 to Stanford English Language Proficiency Examination. South Dakota Department of Education: Pierre, South Dakota.

Cook, H. G. (2005). Research Report #0501: What's Best in the Middle? Student Engagement, Achievement, Attainment, and Growth Differences Between K-8 and Middle School Grade Configurations at Milwaukee Public Schools. Milwaukee Public Schools Office of Assessment and Accountability: Milwaukee, WI.

Cook, H.G. (2003). Technical Report: Scoring of the Nebraska Statewide Eighth Grade Writing Assessment. Nebraska Department of Education: Lincoln, NE.

Cook, H.G. (2001). Investigating Growth Trajectories on English as a Second Language Listening and Reading Comprehension Tests. Unpublished doctoral thesis.

Cook, H.G. (December, 2000). The coming testing backlash? *National Council on Measurement in Education Newsletter, 8:*4.

Cook, H.G., Fredrick, V. & Karbon, J. (2000). *Wisconsin Makes the Connection: Teaching and Testing Reading Comprehension—A Handbook for Teachers.* Wisconsin Department of Public Instruction: Madison, WI.

Fortier, H. Cook, H.G., & Burke, N. (2000). *Wisconsin High School Graduation Test Educator's Guide*. Wisconsin Department of Public Instruction: Madison, WI.

Cook, H.G., Dunsmore, C.J. & Tan, H.S.S. (1998). *Language Testing Video Series #1 Workbook*. Michigan State University Press: East Lansing, MI.

Cook, H.G., Lin, Y.P., Dunsmore, C.J., & Tan, H.S.S. (1998). *Language Testing Video Series #1: Test Development*. Telstate Publications, Michigan State University: East Lansing, MI.

Cook, H.G. (1997). [Review of Davidson, F. (1996). *Principles of Statistical Data Handling*.}. *Studies in Second Language Acquisition, 19*:4, 517.

Cook, H.G. (1994). Computer adaptive testing: A review with an ESL twist. *Papers in Applied Linguistics-Michigan, 8*:1, 1-14.

Keiser-Bishop, C. & Cook, H.G. (1994). Equipping teachers in training: Content-area course development. *Papers in Applied Linguistics-Michigan, 8*:1, 1-12.

Cook, H.G. (1991). Criterion-referenced testing: you can bank on it. *Papers in Applied Linguistics-Michigan, 6*:2, 19-39.

Brown, J.D., Cook, H.G., Lockhart, C. & Ramos, T. (1991). Southeast Asian language proficiency examinations. In S. Anvian (Ed.) *Current Developments in Language Testing*. Singapore: SEAMEO Regional Language Centre.

Professional Service

Federal Title I Peer Reviewer—Standards & Assessments

Served as a federal peer reviewer to evaluate and recommend approval for states' assessment and accountability systems. Received training and served as a table leader for the first round of state peer reviews, February 2005.

Interdepartmental Support

Assisted in the development and teaching of a thesis and dissertation writing course for both native and non-native speakers of English in the Department of Agriculture and Natural Resources. Summer 1993.

Taught seminars in methodology, measurement and evaluation in ESL for the Department of English course ENG 808. Fall 1992, 1993, 1994, 1995, 1996.

Assisted in statistical analysis for Ph.D. candidates in the Department of English.

Conference Director

American Conference Director for the National Teaching of English as a Foreign Language Conference held in Ho Chi Minh City, Republic of Vietnam. Responsible for the recruitment, programming, and development of a teacher's training conference attended by key English language professionals in Vietnam. This was the first English language teaching conference held in Vietnam since 1975. May 1993.

Professional Associations

Member of the American Educational Research Association
Member of the National Council on Measurement in Education
Member of the Wisconsin Assessment Consortium

3. TRAVEL			
1 trip, 2 overnights - business mtg.			
Air Fare	$491		
Lodging	$234		
Meals	$141		
TOTAL	$866 /Trip		$866
2 trips 3 overnights - professional meeting			
Air Fare	$585		
Lodging	$351		
Meals	$188		
TOTAL	$1,124 /Trip		$2,248
TOTAL TRAVEL			$3,114
5. SUPPLIES			
1 Laptop computer			$1,800
2 Desktop computers @ $1,240/ea			$2,480
Web-based collaboration software			$1,700
Research materials			$755
TOTAL SUPPLIES			$6,735
8. OTHER			
Conference			$5,000
Video/web conferencing			$3,000
Computer Support	1.56 FTE X	$2,274	$3,543
e-Services	1.56 FTE X	$1,703	$2,653
TOTAL OTHER			$14,196
9. TOTAL DIRECT COSTS			$148,136
10. INDIRECT COSTS			
Base excludes tuition remission - $4,071.			
WCER	0.17 X	$144,065	$24,491
UW	0.19 X	$144,065	$27,372
TOTAL INDIRECT COSTS			$51,863
12. TOTAL			$200,000

WISCONSIN CENTER FOR EDUCATION RESEARCH
LONGITUDINAL DATA SYSTEMS TO SUPPORT DATA-DRIVEN DECISION-MAKING
YEAR 2 (11/1/2006-10/31/2007)

1. PERSONNEL	% OF EFFORT	FTE	AMOUNT
Meyer, R. PI (b)(4)	(b)(4) 2 Months	(b)(4)	$13,350
Thorn, C., Co-PI (b)(4)	(b)(4) 12 Months	(b)(4)	$10,689
Camburn, E. (b)(4)	(b)(4) 3 weeks summer	(b)(4)	$4,477
Unnamed Researcher $67,925/12 Month*	17% 12 Months	0.170	$11,378
Glover, R. (b)(4)	(b)(4) 12 Months	(b)(4)	$10,195
Sleasman, D. (b)(4)	(b)(12 Months	(b)(4)	$2,172
Program manager (b)(4)	(b)(4)	(b)(4)	$9,627
Program coordinator (b)(4)	(b)(4)		$6,420
Project Assistant (b)(4)			$15,242
Research Team**			$8,887
TOTAL PERSONNEL			$92,437

2. FRINGE BENEFITS

(b)(4)

Unnamed Researcher (b)(4)			$3,950
Program manager			$3,343
Program coordinator			$2,229
Project Assistant			$4,072
Research Team			$3,110
Tuition Remission	0.25 X	$15,242	$3,811
TOTAL FRINGE BENEFITS			$34,722

*Merit increment calculated at 4.5% effective 7/1/07.

**Merit increment calculated at 4.5% effective fall semester '07.

***Merit increment calculated at 4% effective 7/1/07.

3. TRAVEL			
1 trip, 2 overnights - business mtg.			
Air Fare	$511		
Lodging	$244		
Meals	$147		
TOTAL	$902 /Trip		$902
Site visits			$550
2 trips 3 overnights - professional meeting			
Air Fare	$608		
Lodging	$366		
Meals	$196		
TOTAL	$1,170 /Trip		$2,340
TOTAL TRAVEL			$3,792
5. SUPPLIES			
1 Laptop computer			$
2 Desktop computers @ $1,240/ea			$
Web-based collaboration software			$1,700
Research materials			$1,180
TOTAL SUPPLIES			$2,880
8. OTHER			
Conference			$5,000
Video/web conferencing			$3,000
Computer Support	1.51 FTE X	$2,365	$3,566
e-Services	1.51 FTE X	$1,771	$2,671
TOTAL OTHER			$14,237
9. TOTAL DIRECT COSTS			$148,068
10. INDIRECT COSTS			
Base excludes tuition remission - $3,811.			
WCER	0.17 X	$144,257	$24,524
UW	0.19 X	$144,257	$27,409
TOTAL INDIRECT COSTS			$51,933
12. TOTAL			$200,000

WISCONSIN CENTER FOR EDUCATION RESEARCH
LONGITUDINAL DATA SYSTEMS TO SUPPORT DATA-DRIVEN DECISION-MAKING
YEAR 3 (11/1/2007-10/31/2008)

1. PERSONNEL	% OF EFFORT	FTE	AMOUNT
Meyer, R. PI	(b)(4) 12 Months	(b)(4)	$13,989
(b)(4)			
Thorn, C., Co-PI	(b)(4) 12 Months	(b)(4)	$11,199
(b)(4)			
Camburn, E.	(b)(4) summer	(b)(4)	$4,678
(b)(4)			
Unnamed Researcher $70,982/12 Month*	13% 12 Months	0.130	$9,393
Glover, R.	(b)(12 Months	(b)(4)	$10,682
(b)(4)			
Sleasman, D.	(b)(12 Months	(b)(4)	$2,276
(b)(4)			
Program manager $60,061/12 Month*	17% 12 Months	0.170	$10,088
Program coordinator $40,055/12 Month*	17% 12 Months	0.170	$6,727
Project Assistant $34,757/12 Month***	40% 12 Months	0.40	$14,128
Research Team**		0.059	$9,287
TOTAL PERSONNEL		1.42	$92,447

2. FRINGE BENEFITS			
Meyer, R.			(b)(4)
Thorn, C.			
Camburn, E.			
Unnamed Researcher			$3,308
Glover, R.			(b)(4)
Sleasman, D.			
Program manager			
Program coordinator			$2,370
Project Assistant			$3,846
Research Team			$3,297
Tuition Remission	0.25 X	$14,128	$3,532
TOTAL FRINGE BENEFITS			$35,003

*Merit increment calculated at 4.5% effective 7/1/08.

**Merit increment calculated at 4.5% effective fall semester '08.

***Merit increment calculated at 4% effective 7/1/08.

Richard Halverson

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School of Education
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Research Interests

- Developing a theoretical framework for analyzing complex school leadership practices by drawing on classical and contemporary theories of expert practice;
- Conducting empirical investigations of how this framework can contribute to what we know about some of the chronic contemporary issues of school leadership practice, and;
- Designing case-based research methods and examples using multimedia technologies to understand how to communicate leadership practices.

Professional Experience

2001-	Assistant Professor, Department of Educational Administration, University of Wisconsin-Madison. *Madison, WI*
1996-2001	Research Assistant *School of Education and Social Policy, Northwestern University*. Evanston, IL
1993-1996	Principal, *Seton Academy High School*, South Holland Illinois.
1990-1995	Curriculum and Technology Coordinator, *Seton Academy High School*, South Holland, Illinois.
1987-1996	Teacher, *Seton Academy High School*, South Holland, Illinois.

Education

2002	Ph.D., in School of Education and Social Policy, Northwestern University. Dissertation title: *Representing Phronesis: Documenting instructional leadership practice in schools.*
1987	MA in Philosophy, Northwestern University 1987.
1984	BA in Philosophy and History, Marquette University 1984.

Refereed Articles

In press

Halverson, R. "What Can K-12 School Leaders Learn from Video Games and Gaming?" *Innovate: Journal of Online Education.*

Halverson, R., and Rah, Y. "Representing leadership for social justice: The case of Franklin School." *Journal of Cases in Educational Leadership.*

2004

Halverson, R. "Accessing, documenting and communicating the *phronesis* of school leadership practice." *American Journal of Education, 111(1),* 90-122.

Spillane, J. P., Halverson, R., & Diamond, J. B. Towards a theory of leadership practice: A distributed perspective. *Journal of Curriculum Studies*, 36(1), 3-34.

Halverson, R., Linnekin, B. Spillane, J. & Gomez, L. Multimedia cases of practice: On-line learning opportunities for school leaders. *Journal of Cases in Educational Leadership 7(1).* Available at http://www.ucea.org/cases/V7-Iss1/index7-1.htm

2003

Halverson, R. Systems of practice: How leaders use artifacts to create professional community in schools. *Educational Policy and Analysis Archives*. v11, n37. Accessible on-line at http://epaa.asu.edu/epaa/v11n37/

2001 Spillane, J. P., Halverson, R. and Diamond, J.B. "Investigating school leadership practice: A distributed perspective." *Educational Researcher* 30(3): 23-27.

Spillane, J.P., Diamond, J., Walker, L. J., Halverson, R., Jita, L.. "Urban school leadership and elementary science instruction: Identifying, mobilizing and activating resources in a devalued subject area." *Journal of Research in Science Teaching*. v38, n8, 918-940.

Book Chapters

2004 Halverson, R., Kelley, C. & Kimball, S. "Implementing teacher evaluation systems: How principals make sense of complex artifacts to shape local instructional practice." in C. Miskel (Ed.) *Theory and Research in Educational Administration, Volume 3.*

Recent Conference Papers (Refereed)

2004 Halverson, R., and Clifford, M. "Evaluation in the wild: A distributed cognition perspective on teacher assessment." Paper presented at the 2004 University Council of Educational Administration Annual Meeting, Kansas City, Mo.

Halverson, R., Madda, K. and Gomez, L. "Exploring coherence as an organizational resource for carrying out reform initiatives." Paper presented at the 2004 American Educational Research Association Annual Meeting, San Diego, CA.

Halverson, R. and Clifford, M. "How the situation of practice shapes the implementation of new policies in schools." Paper presented at the 2004 American Educational Research Association Annual Meeting, San Diego, CA.

2003 Halverson, R. A distributed leadership perspective on the SCALE theory of action. Paper presented at the 2003 SCALE Research Group Think-Tank. Madison, WI.

Halverson, R. Representing leadership for social justice: The case of Franklin School. Paper presented at the 2003 University Council of Educational Administration Annual Meeting, Portland, OR.

Halverson, R, Kelley, C. & Kimball, S. Implementing teacher evaluation systems: How principals make sense of complex artifacts to shape local instructional practice. Paper presented at the 2003 American Educational Research Association Annual Meeting, Chicago, IL.

Halverson, R. Multimedia narratives of practice: On-line learning opportunities for school leaders. Paper presented at the 2003 American Educational Research Association Annual Meeting, Chicago, IL.

Gomez, L. & Halverson, R. The tensions in committing to principled research for practice. Paper presented at the 2003 American Educational Research Association Annual Meeting, Chicago, IL.

Capper, C. & Halverson, R. "Representing leadership for social justice: Multimedia cases of integrated service delivery." Paper presented at the 2003 American Educational Research Association Annual Meeting, Chicago, IL.

2002 Halverson, R. "Phronesis, artifacts and leadership practice." Paper presented at the 2002 University Council of Educational Administration Annual Conference, Pittsburgh PA.

Halverson, R. "Building professional community: An artifact-based perspective on school leadership." Paper presented at the 2002 University Council of Educational Administration Annual Conference, Pittsburgh PA.

2001 Halverson, R. & Gomez, L. "Phronesis and design: How practical wisdom is disclosed through collaborative design." Paper presented at the 2001 American Educational Research Association Annual Meeting, Seattle WA.

Halverson, R. & Zoltners, J. "Distribution across artifacts: How designed artifacts illustrate school leadership practice." Paper presented at the 2001 American Educational Research Association Annual Meeting, Seattle WA.

Sponsored Research Awards

2004-2009 *CAREER: Data-Driven Instructional Systems—How School Leaders Develop Local Capacity to Use Data to Influence Instruction.* National Science Foundation Early Career Grant. $798,000.

2003-2004 *VAAS: A video annotation and assessment system to help school leaders evaluate teaching practice.* University of Wisconsin Teaching and Learning with Technology Grant. $20,305.

2001-2003 *Documenting successful leadership practice for students who traditionally struggle.* Wallace Dewitt Foundation Grant. $40,000. (with Colleen Capper)

Consultancy, Professional Service, Awards

- Faculty Appointment, University of Wisconsin-Madison Educational Psychology Department. (2001-current)
- Faculty research associate, System-Wide Change for All Learners and Educators (SCALE). (2003- current)
- Consultant, Institute for Learning, University of Pittsburgh. (2004- current)
- Faculty Affiliate, Learning Sciences Interdisciplinary Program, University of Wisconsin-Madison. (2002-current)
- University of Wisconsin representative for the University Council of Educational Administration. (2004-current)
- Publications committee for International Conference of the Learning Sciences. (2004-current)
- Manuscript Reviewer Article Reviewer, Educational Administration Quarterly, Teachers College Record, Educational Evaluation and Policy Analysis,
- Conference proposal reviewer, American Educational Research Conference Division A, University Council of Educational Administration, International Conference for the Learning Sciences, International Conference on Advanced Learning Technologies.
- Review panel, National Science Foundation Research on Learning in Education June 2002 and January 2003; Proposal Reviewer, Spencer Foundation Small Grant Program. June 2002.
- Consultant, *New Leaders for New Schools* Chicago Report, March 2002
- Invited participant, Wisconsin Idea Seminar June 2002
- Spencer Foundation Dissertation Year Fellowship, 2000-2001; Spencer Foundation Research Training Grant Fellowship. 1998-2000.
- Northwestern University Graduate School Fellowship, 1984-87; 1996-1998

VITA

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Assistant Scientist
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Education

Ph.D., University of Wisconsin-Madison, Industrial Relations Research Institute, 1997.
Major field: Human Resources Management; Minor field: Research Methods.

M.A., University of Wisconsin-Madison, Public Administration, 1986.

B.A., University of Wisconsin-Milwaukee, Philosophy, 1974.

Current Projects

Consortium for Policy Research in Education, Teacher Compensation Project, 1997-present. Responsible for coordinating and conducting research on the contribution of new forms of compensation and performance appraisal to organizational effectiveness in the K-12 education sector, developing seminars and providing technical assistance to organizations interested in implementing compensation or performance appraisal programs.

School Finance Redesign Project, Cost of Teacher Turnover (beginning Spring 2005). Responsible for designing and coordinating a study of the costs and causes of teacher turnover in the Milwaukee Public Schools. Funded by the Gates Foundation via a subcontract with the University of Washington.

Selected Publications

Milanowski, A.T., Kimball, S.M., and Odden, A. (2005). Teacher accountability measures and links to learning. Chapter contributed to the 2005 American Educational Finance Association Yearbook *Measuring School Performance and Efficiency: Implications for Practice and Research.* L. Stiefel, A.E. Schwartz, R. Rubenstein, and J. Zabel, eds. 137-159.
.
Milanowski, A.T. (2004). The relationship between teacher performance evaluation scores and student achievement: Evidence from Cincinnati. *Peabody Journal of Education,* 79:4, 33-53.

Kimball, S.M., White, B., Milanowski, A.T., and Borman, G. (2004). Examining the relationship between teacher evaluation and student assessment results in Washoe County. *Peabody Journal of Education,* 79:4,54-78.

Heneman, H.G. III, and Milanowski, A.T. (2004) Alignment of human resource practices and teacher performance competency. *Peabody Journal of Education,* 79:4, 108-125.

Heneman, H.G. III, and Milanowski, A.T. (2003). Continuing assessment of teacher reactions to a standards-based teacher evaluation system. *Journal of Personnel Evaluation in Education,* 17:3, 171-195.

Selected Publications, continued

Milanowski, A.T. (2003). An exploration of the pay levels needed to attract students with mathematics, science and technology skills to a career in K-12 teaching. *Education Policy Analysis Archives,* 11(50). Located at http://epaa.asu.edu/epaa/v11n50/.

Milanowski, A.T. (2003). The varieties of knowledge and skill-based pay design: a comparison of seven new pay systems for K-12 teachers. *Education Policy Analysis Archives*, 11(4). Located at http://epaa.asu.edu/epaa/v11n4/.

Kelley, C., Heneman, H. III, and Milanowski, A. (2002). School-based performance rewards: research findings and future directions. *Educational Administration Quarterly,* 38:3, 372-401.

Milanowski, A.T., and Heneman, H.G. III. (2001). Assessment of teacher reactions to a standards-based teacher evaluation system: A pilot study. *Journal of Personnel Evaluation in Education,* 15:3, 193-212.

Milanowski, A.T. (2000). School-based performance award programs and teacher motivation. *Journal of Education Finance,* 25:4, 517-544.

Milanowski, A.T. (1999). Measurement error or meaningful change? The consistency of school achievement in two school-based performance award programs. *Journal of Personnel Evaluation in Education,* 12:4,343-363.

Heneman, H.G. III, and Milanowski, A.T. (1999). Teachers' attitudes about teacher bonuses under school-based performance award programs. *Journal of Personnel Evaluation in Education,* 12:4,327-341.

Recent Conference Presentations

Milanowski, A.T., and Kimball, S. M. The Relationship Between Teacher Expertise and Student Achievement: A Synthesis of Three Years of Data. Paper presented at the American Educational Research Association Annual Meeting, Montreal, Canada, April 13, 2005.

Milanowski, A.T., Kimball, S., and White, B. The Relationship Between Standards-Based Teacher Evaluation Scores and Student Achievement: Replication and Extensions at Three Sites. Paper presented at the 2004 Annual Meeting of the American Educational Research Association, Chicago, IL, April 14, 2004.

Milanowski, A.T. Relationships Among Dimension Scores of Standards-Based Teacher Evaluation Systems, and The Stability of Evaluation Score - Student Achievement Relationships Over Time. Paper presented at the 2004 Annual Meeting of the American Educational Research Association, Chicago, IL, April 14, 2004.

Milanowski, A. T. Using Occupational Characteristics Information from O*NET to Identify Occupations for Compensation Comparisons with K-12 Teachers. Paper presented at 2003 Annual Meeting of the American Educational Finance Association, Orlando, FL, March 28, 2003.

Anthony T. Milanowski

Teaching and Related Experience

- Lecturer, University of Wisconsin-Madison, School of Education, Fall 2003, 2004.
- Participating Faculty, Industrial Relations Research Institute, 1997-2002.
- Lecturer, University of Wisconsin-Madison, School of Business, various semesters, 1993-2001.

Professional Human Resource Management Experience

- Compensation Analyst, Wisconsin Department of Employment Relations (1995)
- Senior Compensation Planner and Team Leader, Wisconsin Department of Employment Relations, 1988-1993.
- Personnel Specialist, Wisconsin Department of Employment Relations, 1981-1987.
- Personnel Specialist, Wisconsin Department of Health and Social Services, 1979-1981.

Responsibilities included developing models used to estimate costs of collective bargaining agreements, providing cost analysis for management bargaining teams, conducting job analysis and evaluation studies, designing and administering wage surveys, designing and conducting employee attitude surveys, developing selection tests, providing consultation to managers on human resource issues, serving as staff to three Governor's study commissions on compensation issues, and serving as staff to the Civil Service Reform Commission.

Human Resource Management Consulting and Contract Research

Cincinnati Public School District, Cincinnati, Ohio, Spring, 2005
La Crescent-Hokah School District, La Crescent, Minnesota, Summer, 2002,
Cincinnati Public School District, Cincinnati, Ohio, Spring, 2002
Cincinnati Public School District, Cincinnati, Ohio, Spring, 2001
Cincinnati Public School District, Cincinnati, Ohio, Spring, 2000
State of Kentucky Department of Education, Frankfort, Kentucky, March 1999
Colonial School District, Plymouth Meeting, Pennsylvania, December, 1998
Cincinnati Public School District, Cincinnati, Ohio, Spring, 1998
Fox Valley Technical College, Appleton, Wisconsin, 1994
Wisconsin Counties Association, 1992
Dane County, Wisconsin, 1986

Professional Association Memberships

Academy of Management
American Educational Finance Association
American Educational Research Association
American Evaluation Association
American Society for Public Administration
Industrial Relations Research Association

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PROFESSIONAL PREPARATION

University of Wisconsin -- Milwaukee	Educational Studies	B.S., 1985
University of Wisconsin -- Milwaukee	Cultural Foundations of Education	M.S., 1986
University of Wisconsin -- Madison	Educational Policy Studies	Ph.D., 1998

APPOINTMENTS

2002 - Present **Wisconsin Center for Education Research,** ***Co-Principal Investigator, Longitudinal Design to Measure the Effects of MSP Professional Development (MSP) Project.***

1998 - Present **Wisconsin Center for Education Research,** ***Project Director, Measures of the Enacted Curriculum (MEC) Project.***

1999 - 2004 **Wisconsin Center for Education Research,** ***Co-Principal Investigator, Data on Enacted Curriculum (DEC) Project.***

1999 - 2001 **Wisconsin Center for Education Research,** ***Project Director, Design and Development of a Science Assessment Resource Compact Disk .***

2001 – 2003 **Wisconsin Center for Education Research,** ***Research Associate, Consortium for Policy Research in Education (CPRE).***

1994 - 1998 **Wisconsin Center for Education Research,** ***Research Consultant, Council of Chief State School Officers (CCSSO) Surveys of Enacted Curriculum (SEC) Collaborative.***

Publications

Smithson, J.L. (2004). Converging paths: common themes in making assessments useful to teachers and systems. In M. Wilson (Ed.), *Towards Coherence Between Classroom Assessment and Accountability.* The 2004 yearbook of the National Society for the Study of Education. Chicago: University of Chicago Press.

Smithson, J.L. & Porter, A.C. (2004). From policy to practice: the evolution of one approach to describing and using curriculum data. In M. Wilson (Ed.), *Towards Coherence Between Classroom Assessment and Accountability.* The 2004 yearbook of the National Society for the Study of Education. Chicago: University of Chicago Press.

Porter, A.C. & Smithson, J.L. (2001). Defining, developing, and using curriculum indicators. CPRE Research Report Series RR-048. Philadelphia, PA: University of Pennsylvania, Consortium for Policy Research in Education.

Blank, R.K., Porter, A.C., & Smithson, J.L. (2001). New Tools for Analyzing Teaching, Curriculum and Standards in Mathematics & Science. Washington, DC: Council of Chief State School Officers.

Porter, A.C. & Smithson, J.L. (2001). Are content standards being implemented in the classroom? A methodology and some tentative answers. In S. Fuhrman (Ed.), *From the Capitol to the Classroom: Standards-based reform in the states*. The 2001 yearbook of the National Society for the Study of Education. Chicago: University of Chicago Press

Gamoran, A., Porter, A.C., Smithson, J., & White, P.A. (1997, Winter). Upgrading high school mathematics instruction: Improving learning opportunities for low-achieving, low-income youth. Educational Evaluation and Policy Analysis, 19(4),

Porter, A.C., Smithson, J., & Osthoff, E. (1994). Standard setting as a strategy for upgrading high school mathematics and science. In R. F. Elmore & S. H. Furhrman (Eds.), The governance of curriculum: 1994 yearbook of the Association for Supervision and Curriculum Development (pp. 138-166). Alexandria, VA: Association for Supervision and Curriculum Development.

Porter, A.C., Kirst, M.W., Osthoff, E.J., Smithson, J.L., & Schneider, S.A. (1993). Reform Up Close: An analysis of high school mathematics and science classrooms. (Final report to the National Science Foundation on Grant No. SPA-8953446 to the Consortium for Policy Research in Education.). Madison: University of Wisconsin-Madison, Wisconsin Center for Education Research.

Smithson, J.L., Porter, A.C. (1994). Measuring classroom practice: Lessons learned from efforts to describe the enacted curriculum -- The Reform-Up-Close Study. CPRE Research Report Series Report #31. New Brunswick, NJ: Rutgers University, Consortium for Policy Research in Education.

Synergistic Activities

- Co-principal Investigator on NSF funded grant to develop and test using a randomized design, the effects of a professional development program designed to present information to teacher's on instructional practice and content on changing teacher practice.
- Collaborative partner with the Council of Chief State School Officers and their state members to test tools for describing instructional practices and alignment of instructional practices to state and district assessments and content standards.
- Co-principal Investigator on NSF funded grant to examine the effects of MSP sponsored professional development activities on teacher practice and student achievement.
- Operations Director for data collection, processing and reporting activities to support independent state-sponsored Math Science Partnerships and other curriculum-based initiatives in several states.
- Member, Advisory Panel for program evaluation of Explorer Schools, a NASA-sponsored educational initiative.

Collaborators: Rolf Blank (CCSSO), Michael Garet (American Institutes for Research), Bea Birman (American Institutes for Research), Andrew Porter (Vanderbilt University), Norman Webb (UW-Madison).

Wisconsin Department of Public Instruction				
Longitudinal Data Systems to Support Data-Driven Decision-Making				
Three-Year Summary of Proposed Time Commitments (11/1/2005 - 10/31/2008)				
Category:	**Year 1**	**Year 2**	**Year 3**	**Total**
	11/05-10/06	**11/06-10/07**	**11/07-10/08**	
1. Personnel:				
Senior Data Analyst/Database Administrator	120,000	120,000	120,000	360,000
Technical staff position	80,000	80,000	80,000	240,000
2. Fringe Benefits: (based on 60% indirect/fringe):	120,000	120,000	120,000	360,000
3. Travel:				
Quarterly trips for 5 DPI staff @$500/person/trip	10,000	10,000	10,000	30,000
Additional travel for project year 1	10,000	5,000	0	15,000
4. Equipment:	350,000	150,000	250,000	750,000
5. Supplies	2,000	2,000	2,000	6,000
6. Contractual	400,000	400,000	400,000	1,200,000
Total Direct Costs	1,092,000	887,000	982,000	2,961,000
Other	0	0	0	0
Indirect costs	20,000	20,000	20,000	60,000
Training	30,000	20,000	10,000	60,000
Totals	**1,142,000**	**927,000**	**1,012,000**	**3,081,000**
	GRAND TOTAL:		**3,081,000**	

Longitudinal Data Systems to Support Data-Driven Decision-Making
Budget Justification

The information included in this section describes the resources necessary for the Department of Public Instruction (DPI) to accomplish the proposed scope of work. Proposed resource costs integrate personnel salaries, projected fringe benefits, travel, equipment, supplies, contractual services, indirect costs, and training-related expenses. All estimates are based on current salaries and wages, current costs and/or DPI past purchases, and accounting data. Following are descriptions of the expenses included in each category:

1. Personnel

Should this project be funded, DPI's share of the proposed work will involve four main types of personnel that will enable the department to develop a full-service state longitudinal data system: (1) in-kind commitments of time by existing DPI staff, (2) project management staff hired through WCER, (3) contract support staff, and (4) two new positions.

(1) Existing DPI staff: lead IT staff will be assigned to work on and/or manage key parts of this project. In the personnel descriptions below we report estimates of the percent of time that senior management and staff will devote to this project even though it should be understood that the salaries of these staff are covered by existing state funds.
(2) Project management staff: these staff will be hired through WCER and are described in WCER's budget narrative.
(3) Contracted staff: funding has been set aside to allow the hiring of support staff on a contractual basis as determined by project needs.
(4) New positions: it is anticipated that two new staff will be hired to complete DPI's share of the proposed work. These two new positions will include a senior data analyst/database administrator and a technical staff position to support the data warehouse infrastructure and accessibility. The senior staff would coordinate with contractual project managers on system design and implementation. The technical staff position would augment the current helpdesk and infrastructure administration staff supporting all data systems at DPI.

2. Benefits/Fringe Costs

Fringe benefit rates vary by employee classification, as established by State of Wisconsin and University of Wisconsin system policies. In recent years, fringe benefit rates have increased consistently on an annual basis.

3. Travel

All reimbursements for transportation, lodging, meals, and related costs are included in this category. Travel expense reimbursements are made on the basis of actual and

reasonable expenditures. Payments are governed by Wisconsin State Statutes and Travel Regulations. Travel estimates are based on past accounting experience, allowable travel expenses based on the State of Wisconsin travel regulations and travel quotes from Madison travel agencies.

The budget includes travel for quarterly meetings with the tri-state consortium for the length of the grant. It includes travel to provide presentations and some training to districts and vendors on the data warehouse and provides for consulting/coordination meetings to the tri-state consortium on the areas of the proposal for which Wisconsin is the lead.

4. Equipment

Hardware

In order for Data Warehouses to be successful, they must be available, stable and fast. There are two important components when considering performance. One is the design of the warehouse where relational components must be designed to take advantage of the capabilities of the database engine. The second component is hardware the warehouse is running on. Not only is CPU speed important but disk access speed for a warehouse is critical.

DPI will leverage existing hardware during the initial development and pilot stages of the Data Warehouse but will require additional hardware capabilities as the size and audience of the warehouse expands. Our budget includes an expansion of our existing hardware in year three to meet the production demand. We will be using open systems or Microsoft Windows based platforms that meet State of Wisconsin standards and policies.

Other software applications that get developed or interfaced can leverage our current infrastructure and require no additional hardware purchases.

Software

DPI makes every attempt to find off the shelf software that can be used to meet our needs before developing our own solutions. Generally we find that we can purchase infrastructure software that we can then tailor to meet our needs. We will continue with this purchasing philosophy for the purposes of this grant.

The budget includes new development and infrastructure software purchase in the first 2 years, with additional licensing to ramp up user access and support in the third year.

We have identified software packages that will aid us in delivering a quality solution. These packages include:

- Oracle – Will be the database engine for our data warehouse. Oracle is the standard database engine used by DPI, as well as the State of Wisconsin chosen standard, and therefore is required for this project.

- Cognos Powerplay and ReportNet servers (or similar tools). Cognos is the industry leader in providing secure web-based access, and also has a significant presence in education. We will be able to leverage this knowledge as we "roll out" their tools. ReportNet gives us the ability to create various targeted reports for our stakeholders, and Powerplay will allow us to give researchers the ability to access our data in safe and secure manners.
- A Data Dictionary tool (vendor to be determined) will give us the ability to easily structure and update our data dictionary. If the data dictionary is not easy to update, over time it will become stale and obsolete.
- A Common Development framework (vendor to be determined). Not all of our needs can be provided by "out of the box" tools. We will need to develop software and interfaces specific to DPI needs and our user requirements. To do this as easily as possible we will require a development framework that boosts the productivity of our development staff.
- Software Development Collaboration tools (vendor to be determined) provide excellent services for managing and collaborating on software development. They could also provide an excellent "front end" to multiple databases. This tool will be used by product development and as the initial access point to the data warehouse.
- Portal Software (vendor to be determined) provides the interface to the data. Portal software is designed to restrict access to data the user is allowed to see. It also allows end users to customize their interface to our data. Portal software is the most important component in creating a satisfied end user.

5. Supplies

This covers basic supply costs including printing and copying services, mailing costs and other miscellaneous costs associated with supporting a major implementation project.

6. Contractual

The budget includes the cost of contractual assistance to manage and implement the proposal.

This line includes (b)(4) each year that will be paid to the Wisconsin Center for Education Research (WCER). WCER will provide project management and coordination services between the tri-state consortium. They are integral in the collaboration of the three states providing components of a complete and quality system. They will also provide end-use and research assistance to DPI. DPI will use this help and information to design and improve the data warehouse and resulting reporting and data availability.

The remaining costs will be used to include contract staff to augment DPI staff in software, data warehouse and infrastructure development, and implementation. Rates and vendors will be based on the State of Wisconsin central Vendor Management System. We expect to augment internal staff skill sets with additional data modeling and

dimensional skills as well as data warehouse extraction, population, and access control knowledge.

10. Indirect Costs

This line covers the following project support costs: administration of grants, contracts, subcontracts and agreements; budget consultation and preparation; programmatic accounting; financial reporting/monitoring; fiscal consultation; personnel services/activities; policy, procedure and regulation consultation; expenditure audit/review; facility management; equipment management; computer and multimedia support (not covered by direct costs); mail and shipment delivery; secretarial pool management; telephone installation, rental, and general usage; normal equipment service; normal editorial service; normal graphic service; office supplies; and miscellaneous program support; and facility operation and maintenance, and building usage charge.

11. Training

Training is budgeted for current DPI staff and central State of Wisconsin IT staff. This includes data warehouse concept and design training as well as training in the development and implementation of tools and utilities that will be chosen. The costs assume higher upfront training costs and then fewer new and refresher training efforts for support and maintenance staff as the project is fully implemented.

WISCONSIN CENTER FOR EDUCATION RESEARCH
LONGITUDINAL DATA SYSTEMS TO SUPPORT DATA-DRIVEN DECISION-MAKING
3-YEAR SUMMARY (11/1/2005-10/21/2008)

		YEAR 1 11/05 - 10/06	YEAR 2 11/06 - 10/07	YEAR 3 11/07 - 10/08	TOTAL BUDGET
1. PERSONNEL					
Meyer, R., PI		$12,776	$13,350	$13,989	$40,115
Thorn, C., Co-PI		$10,227	$10,689	$11,199	$32,115
Camburn, E.		$4,284	$4,477	$4,678	$13,439
Unnamed Researcher		$11,219	$11,378	$9,393	$31,990
Glover, R.		$9,756	$10,195	$10,682	$30,633
Sleasman, D.		$2,079	$2,172	$2,276	$6,527
Program Manager		$9,213	$9,627	$10,088	$28,928
Program Coordinator		$6,144	$6,420	$6,727	$19,291
Project Assistant		$16,284	$15,242	$14,128	$45,654
Research Team		$8,380	$8,887	$9,287	$26,554
TOTAL PERSONNEL		$90,362	$92,437	$92,447	$275,246
2. FRINGE BENEFITS					
Fringe Benefits		$29,658	$30,911	$31,471	$92,040
Tuition remission		$4,071	$3,811	$3,532	$11,414
TOTAL FRINGE BENEFITS		$33,729	$34,722	$35,003	$103,454
3.TRAVEL		$3,114	$3,792	$3,374	$10,280
5. SUPPLIES		$6,735	$2,880	$3,070	$12,685
8. OTHER					
Conference		(b)(4)			
Video/web conferencing					
Computer Support					
e-Services					
TOTAL OTHER		$14,196	$14,237	$14,100	$42,533
9. TOTAL DIRECT COSTS		$148,136	$148,068	$147,994	$444,198
10. INDIRECT COSTS					
Base excludes tuition remission - $11,414.					
WCER	0.17	$24,491	$24,524	$24,559	$73,573
UW	0.19	$27,372	$27,409	$27,448	$82,229
TOTAL INDIRECT COSTS		$51,863	$51,933	$52,006	$155,802
12. TOTAL COSTS		$200,000	$200,000	$200,000	$600,000

WISCONSIN CENTER FOR EDUCATION RESEARCH
LONGITUDINAL DATA SYSTEMS TO SUPPORT DATA-DRIVEN DECISION-MAKING
YEAR 1 (11/1/2005-10/31/2006)

1. PERSONNEL	% OF EFFORT		FTE	AMOUNT
Meyer, R. PI (b)(4)	(b)(4)	12 Months	0 (b)(4)	$12,776
Thorn, C., Co-PI (b)(4)		12 Months	0	$10,227
Camburn, E. (b)(4)*		3 weeks summer	0.0	$4,284
Unnamed Researcher $65,000/12 Month*	17%	12 Months	0.170	$11,219
Glover, R. (b)(4)	(b)(4)	12 Months	0. (b)(4)	$9,756
Sleasman, D. (b)(4)		12 Months	0.	$2,079
Program manager $55,000/12 Month*	17%	12 Months	0.170	$9,213
Program coordinator $36,680/12 Month*	17%	12 Months	0.170	$6,144
Project Assistant $32,134/12 Month***	50%	12 Months	0.50	$16,284
Research Team**			0.059	$8,380
TOTAL PERSONNEL			1.56	$90,362

2. FRINGE BENEFITS			
Meyer, R.			$4,372
Thorn, C.			$3,501
Camburn, E.			$1,478
Unnamed Researcher			$3,839
Glover, R.			$3,339
Sleasman, D.			$711
Program manager			$3,153
Program coordinator			$2,103
Project Assistant			$4,271
Research Team			$2,891
Tuition Remission	0.25 X	$16,284	$4,071
TOTAL FRINGE BENEFITS			$33,729

*Merit increment calculated at 4.5% effective 7/1/06.

**Merit increment calculated at 4.5% effective fall semester '06.

***Merit increment calculated at 4% effective 7/1/06.

3. TRAVEL

1 trip, 2 overnights - business mtg.			
Air Fare	$531		
Lodging	$254		
Meals	$153		
TOTAL	$938 /Trip		$938
2 trips 3 overnights - professional meeting			
Air Fare	$633		
Lodging	$381		
Meals	$204		
TOTAL	$1,218 /Trip		$2,436
TOTAL TRAVEL			$3,374

5. SUPPLIES

1 Laptop computer	$
2 Desktop computers @ $1,240/ea	$
Web-based collaboration software	$1,700
Research materials	$1,370
TOTAL SUPPLIES	$3,070

8. OTHER

Conference	(b)(4)		
Video/web conferencing			
Computer Support			
e-Services			
TOTAL OTHER			$14,100
9. TOTAL DIRECT COSTS			$147,994

10. INDIRECT COSTS

Base excludes tuition remission - $3,532.			
WCER	0.17 X	$144,462	$24,559
UW	0.19 X	$144,462	$27,448
TOTAL INDIRECT COSTS			$52,006
12. TOTAL			$200,000

WI CENTER FOR EDUCATION RESEARCH
Budget Justification

The information included in this proposal indicates the resources necessary for the Wisconsin Center for Education Research to accomplish the work described in the Technical Proposal. Resource requirements in this proposal were defined by the principal investigators. Estimated resource costs have been generated by the Center Business Office, integrating salaries, projected merit increases, projected fringe benefits, travel, identified supplies and services, and overhead rates,. All estimates are based on current salaries and wages, current costs and/or Center accounting data. Following are descriptions of the expenses included in each category:

1. PERSONNEL

All persons who work regularly for the Center are placed on the University of Wisconsin payroll in accordance with established University procedures. Titles and stipends are regulated and approved by Center management, the Dean of the School of Education, Madison Campus and University Central Administration. Salaries for professorial, professional, and graduate assistant staff are based on current salaries. Merit increments are calculated each year at 4.5% effective fall semester for professorial staff and effective July 1 for professional staff, and at 4% effective July 1 for graduate assistant staff.

The level of effort indicator used is Full Time Equivalent (FTE). One FTE equals one person working full time for one year. One year for academic staff (professorial) is a nine-month academic year and a two and two-thirds months summer session. Annual staff (professional and graduate assistant) is appointed on a twelve-month basis.

Staffing for this project is split across three state proposals – Michigan, Minnesota, and Wisconsin. The percentages of FTE effort reflect total expenditure across the three subgrants.

Robert Meyer, the principal investigator, will supervise and coordinate this research project. He will coordinate collaborative cross-state research, oversee research on end-use data applications, and direct research activities conducted at WCER. He is budgeted at 40% time for all three years of the project.

Chris Thorn, will be the technology lead and will coordinate the collaborative cross state research on information systems and decision support tools. He is budgeted at 30% time for all three years of the project.

David Sleasman at 12% time will support partnership collaboration through the use of an enterprise-level web-based working environment (Vignette Business Collaboration Server).

Bob Glover at 50% time will support database architecture and decision-support research and development. He will coordinate requirements definition and development activities of the participating data system designers in the partnering states.

Contributions from various University of Wisconsin-Madison experts will be funded at 18% per year and will be drawn from a group of advising faculty members: Douglas Bates, Julie K. Underwood, Adam Gamoran, Daniel M. Bolt, Eric Camburn, & Richard Halverson.

Eileen Kellor will provide project management for the WCER-based team. She will also assist in coordinating partnership wide activities with team leaders at each state. This position is funded at 50% for all three years.

A project coordinator will provide administrative support to project staff. This work includes tasks as well as transcription, coordination with research sites, and other research support duties. This position is funded at 50% for all three years.

One unnamed researcher is funded at 50% in years one and two and 40% in year three. This position is intended to allow the project team to purchase time from various technical experts currently working on other teams within WCER. Research staff included in this pool include: Anthony T. Milanowski, John Smithson, & Chris Fassnacht.

One graduate student at 50% time in year one, 45% in year two, and 40% in year 3 (supplemented by an additional graduate student at peak times) will provide support for data preparation, programming, and preparation of tables and charts.

2. EMPLOYEE BENEFITS

Fringe benefit rates vary by employee classification. Classifications and rates are established by the University. In recent years, fringe benefit rates have increased consistently on an annual basis and are increased slightly for each year following June 30.

Tuition Remission. Tuition remission costs are calculated at a rate of 25% of salaries paid to graduate assistants. These charges are in accordance with OMB Circular A-21, Section J.41, "Scholarships and Student Aid Costs," and Section A.2.c. "Purpose and Scope."

3. TRAVEL

All reimbursements for transportation, lodging, meals, and related costs are included in this category. Travel expense reimbursements are made on the basis of actual and reasonable expenditures. Payments are governed by Wisconsin State Statutes and the University of Wisconsin System Travel Regulations. Travel estimates are based on past Center accounting experience, allowable travel expenses based on the University and State of Wisconsin travel regulations and travel quotes from Madison travel agencies. An inflation rate of 4% is built into each succeeding year. The travel described below reflects total expenditure across the three subgrants.

Trips to each of the out of state partners (Michigan and Minnesota) are budgeted in year two.

The budget includes 3 trips to DC to attend PI meetings or other coordinating events for the partnership each year.

For the purpose of discussing the work and disseminating results, six trips to professional meetings are budgeted each year.

5. SUPPLIES

Supplies are budgeted for $20,205 in year one, $8,650 in year two, and $9,210 in year 3. In year one, we budgeted for 3 desktop computers, 2 laptops, a printer, software, and license fees for the web-based collaboration software. In year's two and three will be replacing existing computers for project staff. We will also be purchasing additional software packages as dictated by ongoing research needs.

8. OTHER

Conference and video/web conferencing includes potential external services that may need to be purchased from other units including consulting from data architects at our Division of Information Technology. It also includes support for web-based conferencing and for an annual working meeting for all Consortium members.

Computer Support. Computer support includes: access to a wide range of office productivity and analytical software; micro-computer hardware acquisition consultation and setup; installation and upgrading of software; end-user training; providing access and management on a local area network; troubleshooting of hardware and software; and technical assistance on a daily basis. This service is calculated at $2,274 per FTE based on past Center accounting data. An inflation rate of 4% is built into each succeeding year.

e-Services. eServices offers an array of programming and creative services to researchers at WCER. Skilled personnel and advanced technologies are available to assist project with research-focused programming, web design, video, multimedia, and graphics. eServices support includes initial consulting with staff on web design, video data collection, application and database programming, graphics, server space, and access to equipment. This service is calculated at $1,703 per FTE based on past WCER accounting data. An inflation rate of 4% is built into each succeeding year.

10. INDIRECT COSTS

Modified Total Direct Cost (MTDC) is used as the base for overhead calculations. The MTDC base includes all direct charges except tuition remission. The University negotiates with DH&HS Region 5 to establish indirect cost rates. The rates used in this proposal are the approved rates effective July 1, 2000. The rates are:

<u>WCER</u> – The WCER indirect costs rate of 17% covers the following project support costs: administration of grants, contracts, subcontracts and agreements; budget consultation and preparation; programmatic accounting; financial reporting/monitoring; fiscal consultation; personnel services/activities; policy, procedure and regulation consultation; expenditure audit/review; facility management; equipment management; computer and multimedia support (not covered by direct costs); mail and shipment delivery; secretarial pool management; telephone installation, rental, and general usage; normal equipment service; normal editorial service; normal graphic service; office supplies; and miscellaneous program support. In addition,

Center Management, University relations, and external relations with education and funding agencies are included.

University – The University indirect costs rate of 19% covers the following categories of cost: University general and administrative expense, sponsored projects administrative expense, University libraries expense, activity support expense, student administration and service, Dean's office expense, facility operation and maintenance, and building usage charge.

Appendix A – Timeline

State-Specific Project Phasing. In order to proceed in step with partner states, we have identified several incremental phases in both gathering stakeholder requirements and mandated data collections. Each stakeholder group brings to the process different coordination needs and varying levels of complexity. Nevertheless, there are several key types of stakeholders that must be included: (1) state data warehouse users, (2) district data warehouse users, and (3) school data warehouse users. Each data collection carries a separate set of rules for security and complexity, including, but not limited to: (1) assessment, (2) student enrollment, (3) programs, and (4) finance.

There are two major dimension in this work – coordination of tasks based on needs/expertise and appropriate phasing of design and development activities that reflect local data collection and reporting timelines. Table 1 describes he tasks according to identified areas of expertise and need. Table 2 provides a detailed representation of each of the overall plan of work, the state specific implementation plan and the 5 major lines of work outlined in the proposal.

Table 1. Cross-State Collaboration and Task Responsibilities by State

✓✓✓ = primary responsibility ✓✓ = secondary/shared responsibility ✓ = review and implementation

Task/Subtask	*Mich.*	*Minn.*	*Wisc.*	*WCER*
I. Data Analysis and Research Requirements				
A. Value-added performance indicators	✓	✓✓	✓	✓✓✓
B. Evaluation of instructional practices and programs	✓	✓	✓✓	✓✓✓
C. Teacher education	✓	✓	✓✓	✓✓✓
D. Student and staff mobility	✓	✓	✓	✓✓✓
E. Tri-state coordination	✓	✓	✓	✓✓✓
II. Data Access Policies				
A. Deadlines for reporting	✓✓✓	✓	✓	✓
B. Transactions vs. snapshot collection	✓✓✓	✓✓	✓	✓
C. Outreach to stakeholders	✓✓	✓	✓✓	✓
D. Who has access to what data?	✓✓	✓✓✓	✓✓	✓
E. Professional development	✓✓✓	✓	✓	✓
F. Tri-state coordination	✓	✓	✓	✓✓✓
III. Data Dictionary				
A. Dictionary standards	✓	✓✓✓	✓	✓
B. Student course transcripts	✓	✓	✓✓✓	✓✓✓
C. Survey of instructional practices and educational programs 1. Teachers 2. Principals 3. District staff	✓✓	✓✓	✓✓	✓✓✓

Task/Subtask	*Mich.*	*Minn.*	*Wisc.*	*WCER*
D. Outreach to stakeholders	✓✓	✓	✓✓	✓
E. Tri-state coordination	✓	✓	✓	✓✓✓
IV. Data Warehouse				
A. Design 1. Assessments 2. Students 3. Course transcripts 4. Classroom inputs 5. Teacher data 6. School inputs 7. Principal data 8. District data	✓	✓✓✓	✓	✓
C. Data levels 1. Raw data 2. Data aggregates and composites 3. Reports	✓✓	✓	✓	✓✓
D. Stakeholders Retrieval 1. State education agency 2. Districts 1. Large urban 2. Suburban 3. Rural 3. Schools 1. Traditional 2. Charter 3. Other 4. Teachers 5. Parents and students 6. Policy makers and public	✓✓	✓✓	✓✓	✓
E. Role based authentication and access	✓	✓✓✓	✓	✓
F. Integration and interoperability	✓✓	✓✓✓	✓✓	✓
G. Tri-state Coordination	✓	✓	✓	✓✓✓
V. Secure Data Transport				
A. Design	✓	✓✓✓	✓	✓
B. Designs for rapid turn-around and non-duplication	✓✓	✓	✓✓	✓
C. Federal, State, and local compliance reporting	✓✓	✓✓	✓✓	✓
D. Data exchange (e.g., transcripts and test scores) across schools, districts, states	✓✓	✓✓✓	✓	✓
E. Implementation	✓✓	✓✓	✓✓	✓
F. Tri-state coordination	✓	✓	✓	✓✓✓

Table 2 Cross-State Activity Listing by Quarter (*Recurring events)

Table 2.1 Overall Activity Schedule	
Date	Milestone or Deliverable
2005 Q4	Prep: three-phase plan / states define phase 1 /design and analysis of phase 1
2006 Q1	Prep: collaboration plan – standards (outline for initial dictionary standards, directory standards, common metamodel, and data transport)
Phase 1	
2006 Q1-Q3	Requirements, data element design and entry, and access control
2006 Q2	Data warehouse design/modeling
2006 Q2	Management pilot
2006 Q3	Dictionary Standards for phase 2
2006 Q4	Test/Redesign and training/rollout
Phase 2	
2007 Q1-Q3	Requirements and access control
2007 Q2	Data warehouse redesign
2007 Q2	Management pilot
2007 Q3	Dictionary Standards for phase 3
2007 Q4	Test/Redesign and training/rollout
Phase 3	
2008 Q1-Q3	Requirements, data element design and entry, and access control
2008 Q2	Data warehouse extension
2008 Q2	System Extension – Focus on development/maintenance/monitoring
2008 Q2	Management pilot
2008 Q3	Dictionary standards extension – maintenance
2008 Q4	Test/Redesign and training/rollout

Table 2.2 Data Analysis and Research Requirements	
Date	Milestone or Deliverable
*2005 Q4	Surveys/Focus groups designed and stakeholder issues around reporting identified
*2006 Q1	Focus groups conducted/surveys distributed
*2006 Q2	Surveys/Focus group results and analysis
2007 Q1-Q2	Surveys/Focus groups/reporting redesign
2008 Q1-Q2	Surveys/Focus groups reporting extension

Table 2.3 Data Policies	
Date	Milestone or Deliverable
*2006 Q1	Prep: Assemble relevant cross-state policies
*2006 Q2	Discuss policy similarity/differences among states in areas of planned development
*2006 Q3	Data-driven access control pilot
*2006 Q4	Data-driven access control implementation
2007 Q3	Data-driven access control redesign
2008 Q3	Data-driven access control extension

Table 2.4 Data Dictionary	
Date	Milestone or Deliverable
2005-2006	Build capacity prerequisite skill in relevant tools and technology (XML, CWM, related standards of NIEM, ISO-11179)*
*2005 Q4	Convene program area experts
2006 Q1	Data dictionary software purchase
2006 Q1	Development of high level data model – pilot
*2006 Q1	Data element design (Y1: Students and Assessment, Y2: District, School, Programs, Y3: School and Classroom)
*2006 Q2	Elements complete (Y1: Students and Assessment, Y2: District, School, Programs, Y3: School and Classroom)
*2006 Q2	Assign and foster data stewards
*2006 Q3	Planning for redesign/expansion of elements
2006-2007	Redesign/Add elements
2007-2008	Element extensions

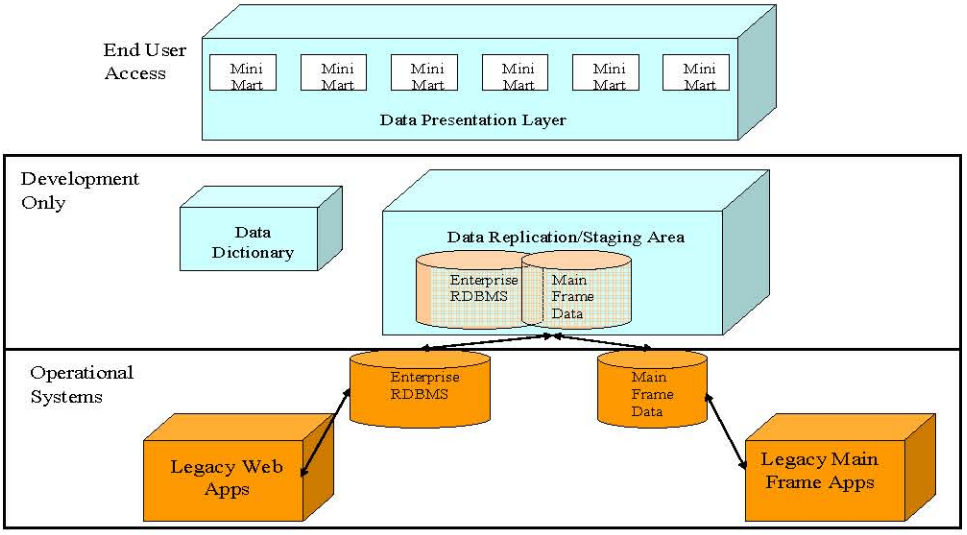
Table 2.5 Data Warehouse	
Date	Milestone or Deliverable
2005 Q4	Tools and software purchase arrangements
2006 Q1	Build capacity in DW tools/software (State)
2006 Q1	Data warehouse design (Student-Level Assessment) - Completion of state data model
2006 Q4	Student ID systems complete
2006 Q4	Planning for redesign / increase capacities post-implementation
2007 Q1	Data warehouse redesign
2007 Q4	Planning for extension / increase capacities post-implementation
2008 Q1	Data warehouse extension
2008 Q4	Planning for post-grant maintenance/monitoring

Table 2.6 Secure Data Transport – Collections and Submissions	
Date	Milestone or Deliverable
2005-2006	Prep: Capacity building – (SOA, Open Architecture, WS Security, SIF)
2007 Q1	Standards defined/stakeholders consulted
2007 Q3	Secure reporting project pilot (Federal Submission)
2007 Q4	Secure collection project pilot (District Submission)

Table 2.7 Wisconsin-Specific Implementation and End Use Applications	
Date	Milestone or Deliverable
2008 Q4	School/Teacher level pilot
2008 Q4	School/Teacher level analysis pilot
*2005 Q4	Inventory instructional practice and program requirements as resource for other states.
*2005 Q4	State tests given in 3rd through 8th and 10th grades – longitudinal link to warehouse
*2006 May	Adequate Yearly Progress (AYP) reported
*2006 Q2	State level access policies
*2006 Q4	Training on access with implementation of Phase 1
*2006 Q1	AYP planning for grades 3-8, 10
2006 Q2	Teacher licensure system specifications and beginning of development – element inventory
2006 Apr	State test data loaded into data warehouse
2006 May	Identify AYP data
2006 Oct	Fall Enrollment Report Deadline: PI-1290 to ISES
2006 Q4	ISES system stable – second year
2006 Oct	ISES collection groundwork
2007 Q2	Teacher-classroom collection planned
2007 Q2	Large district/CESA warehouse map initiation
2007 Q4	EDEN Data collection pilot (target Mar 31, 2008)
2007 Oct	ISES collection mapped as part of SOA
2008 Q2	Large District/CESA warehouse map
2008 Oct	ISES/SOA integration
2008 Q4	Automated EDEN data system (target Dec 31, 2008)

Appendix B

Figure 2. High Level Physical Architecture of Data Warehouse/Data Marts



Initial Phase of Data Warehouse/Data Mart

Figure 3. Parallel Data Warehouse Structure with State, Regional, and District Warehouses

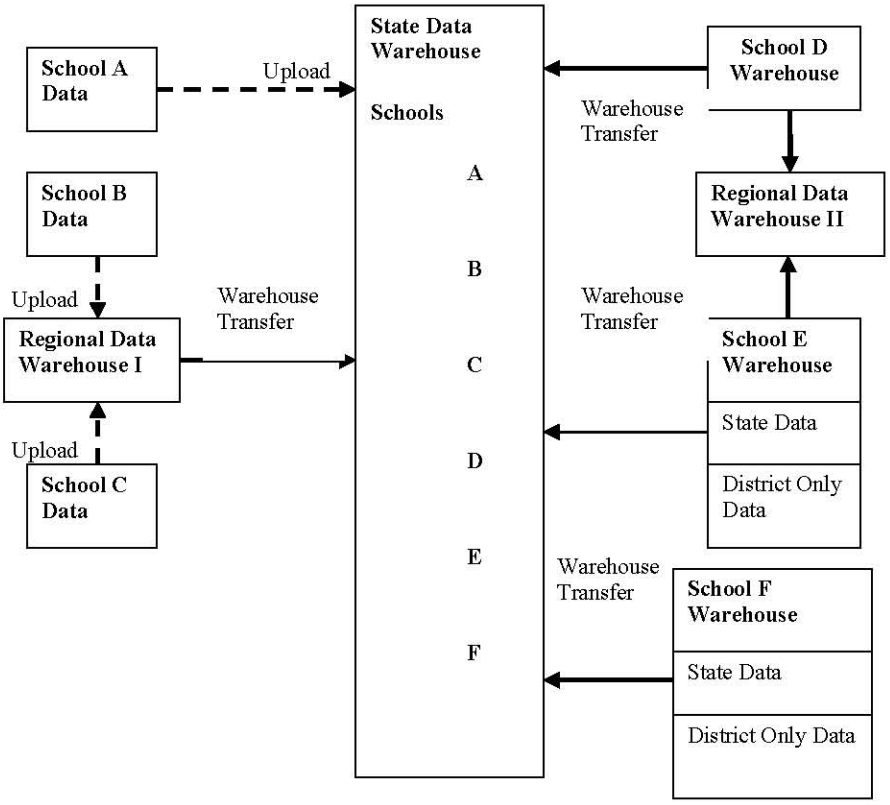
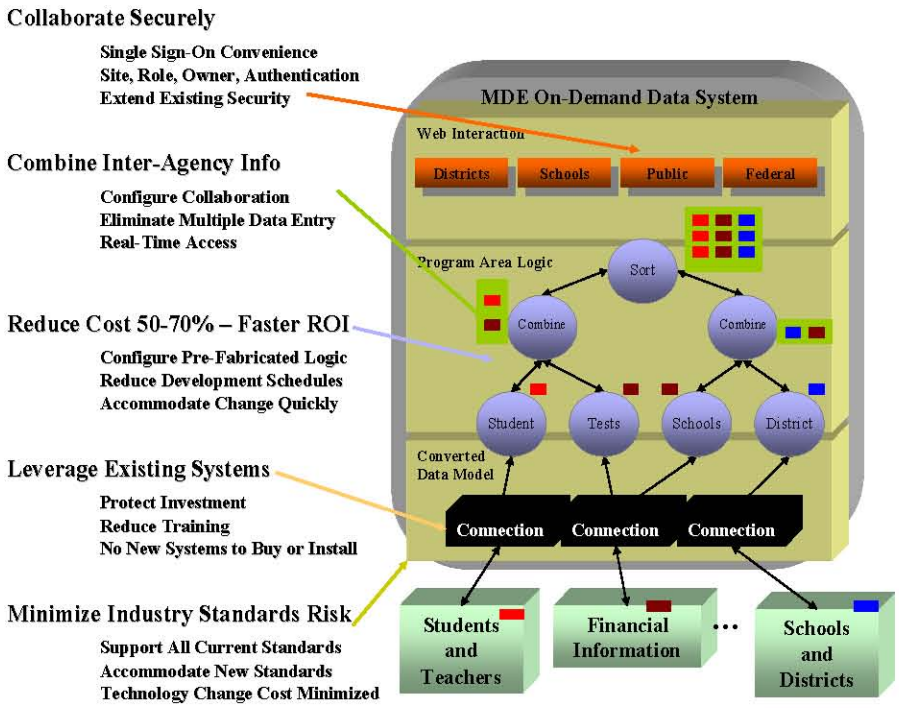


Figure 4. Model-Driven Architecture (MDA)



A General Value-Added and Longitudinal Analysis Model

Value-added and longitudinal data analyses will be important end-use applications of the proposed longitudinal data system. This section presents a general value-added/longitudinal model, summarizes some of the important features of this model, and discusses the types of data bases (resident in the longitudinal data warehouse) needed to estimate the model. Extensive resources on these models and other data-analytic methods are availabel from WCER's Value-Added Research Center.

Box I presents the student level (subscript i) of a multi-level model with higher levels for classrooms (j), schools (k), districts (l), and possibly states. The definitions of the model parameters, data variables, and error components are contained in text boxes with arrows pointing to the appropriate model element. This basic model can be generalized to accommodate most, if not all, of the existing value-added and multi-level longitudinal models that are currently in use. (Different models make different assumptions about the degree to which student error components are correlated over time and whether the student, classroom, school, and district effects are fixed or random. Some models also exclude specific features of the model (e.g., demographic effects) or impose restrictions on some of the parameters (δ =1 in a linear growth model). Note that the model is sufficiently general that to allow for the possibility that students may be "enrolled" in a single classroom (typical at the elementary school level, but not always the case) or in multiple classes, for example, mathematics, science, English, language arts, and social studies. Similarly, the model allows for the possibility that students may attend more than one school during a school year. The classroom participation indicators in the model – the I

variables – are set to one if an individual is enrolled in a given class for an entire school year and set to a fraction to capture partial year enrollment.

Box I. A Value-Added Model for a Given Subject, Grade, and Year

$$Y_{2i} = \mu + \delta Y_{1i} + \kappa' X_i + \sum_{l(\text{district})} \sum_{k(\text{school})} \sum_{j(\text{class})} \left\{ \alpha_{jkl}^{\text{class}*} I_{Cijkl} + \beta_{kl}^{\text{school}*} I_{Sikl} + \chi_l^{\text{district}*} I_{Dil} \right\}$$

Posttest

Pretest

Student Characteristics

True Total Classroom Effect

True Total School Effect

True Total District Effect

Stud. Error Term

Classroom Participation Indicator

School Participation Indicator

District Participation Indicator

One novel aspect of the above model is that we have specified the effects in the model as "true" effects so as to distinguish the effects that we would like to estimate – the true effects – from the effects that are identified; that is, the effects that can be estimated. This distinction is important in the value-added context because value-added effects are obtained as the residuals after controlling for observed data. Some of the major effects (also referred to as indicators) that can actually be estimated are contained in Box II.

Box II. Value-Added Indicators Obtained From Value-Added Model

Total Classroom, School, and District Effect

$$(\alpha\beta\chi)_{jkl}^{\text{class/school/district}} = \alpha_{jkl}^{\text{class}*} + \beta_{kl}^{\text{school}*} + \chi_l^{\text{district}*}$$

Total School and District Effect

$$(\beta\chi)_{kl}^{\text{school/district}} = \bar{\alpha}_{.kl}^{\text{class}*} + \beta_{kl}^{\text{school}*} + \chi_l^{\text{district}*}$$

Relative Classroom Effect

$$\alpha_{jkl}^{\text{class}} = (\alpha\beta\chi)_{jkl}^{\text{class/school/district}} - (\beta\chi)_{kl}^{\text{school/district}} = \alpha_{jkl}^{\text{class}*} - \bar{\alpha}_{.kl}^{\text{class}*}$$

Note that it is possible to estimate the combined effect of classroom, school and district effects (the sum of the residuals from all levels of the model, except for the student-level residuals – assumed to have an expected mean of zero at higher levels). Some analysts refer to this effect as a teacher effect, but it is clear that this effect absorbs the contributions of all educational levels. This effect can be aggregated to obtain a total school and district effect and these two effects can be differenced to obtain a relative classroom effect. Thus latter effect captures the effectiveness of classrooms in a school relative to the other classrooms in that

school. Which value-added effects are useful for policy makers and educational stakeholders is something that we will explore during the project.

Box III. A Model to Evaluate the Effects of Classroom, School, and District Practices and Programs for a Given Subject, Grade, and Year

Classroom Level

$$\alpha_{jkl}^{\text{class}*} = \sum_{m(\text{teacher})} \left(\phi_1' T_m + u_{Tjklm}^*\right) I_{Tjklm} + \phi_2' C_{jkl} + w_{Cjkl}^*$$

True Total Classroom Effect

Effect of Measured Teacher Inputs

Effect of Measured Classroom Inputs

Measured Teacher Inputs

Unmeasured Teacher Effects

Measured Classroom Inputs

Unmeasured Classroom Effects

School Level

$$\beta_{kl}^{\text{school}*} = \sum_{n(\text{principal})} \left(\gamma_1' P_n + u_{Pkln}^*\right) I_{Pkln} + \gamma_2' S_{kl} + w_{Skl}^*$$

True Total School Effect

Effect of Measured Principal Inputs

Effect of Measured School Inputs

Measured Principal Inputs

Unmeasured Principal Effects

Measured School Inputs

Unmeasured School Effects

District Level

$$\chi_l^{\text{district}*} = \eta' D_l + w_{Dl}^*$$

True Total District Effect

Effect of Measured District Inputs

Measured District Inputs

Unmeasured District Effects

Box III contains the additional three levels of the multi-level model. These equations extend the model from one that is limited to classroom, school, and districts effects to a model that incorporates educational inputs at each level (instructional practices, leadership strategies, policies, programs, etc.). The model system as a whole can be used to estimate value-added indicators (as discussed above) and to estimate the effects of educational programs and other inputs. Thus, a single model can be used for educational accountability purposes and to evaluate program effectiveness. One of the end-use applications that we will explore is combining both of these tasks so that it is possible to provide direct guidance to educators about available program options that will improve the performance of classrooms and schools. This is an exciting extension of the value-added tool box, an application that we refer to as "diagnostic value-added analysis."

An important feature of the classroom/class and school equations is that they have been designed to allow for the reality that teachers may teach multiple sections in a given year (for example, three sections of Algebra 1, 2 sections of geometry, and perhaps even a course in a different subject area) and that teachers and principals may be assigned to different schools and classes during given school years and in different school years. Thus, one of the strengths of the model is that it allows for the reality of student, teacher, and principal mobility over time.

As discussed in the proposal, an inportance motivation for studying end-use applications is to "derive" data warehouse and dictionary specifications that are needed to support the application. We present a succinct summary of these data needs in Box IV. Note that we distinguish data elements are serve as unit identifiers (the class of I variables) and educational inputs (variables X, C, T, P, S, and D).

Box IV. Data Bases Required to Support High-Level Longitudinal and Other Analyses

Data Base	Unit Identifier	Linked Identifiers / Examples of Educational Inputs	Statistical Variables
Student assessments and other outcomes (by subject, grade, and year)	Student ID [i]	Test scores Student attendance (aggregate) Disciplinary events	Y_{it}
Student characteristics	Student ID [i]	Demographic characteristics	X_{it}
Student Course Transcripts	Student ID [i]	Course/class ID [(jkl)]	$I_{Ci(jkl)t}$
		Course grade, credits	
		Enrollment dates (begin, end)	
		Attendance (by course)	
Course/class	Course ID [(jkl)t]	Teacher ID [m]	$I_{T(jkl)mt}$
		Principal ID [n]	$I_{P(jkl)nt}$
		School [k]	
		District [l]	
		Course inputs:	$C_{(jkl)t}$

		Class size Instructional practices Facilities and resources Test preparation activities	
Teacher	Teacher ID [m]	Teacher inputs: Teacher characteristics Education and training Employment history Test scores (prior to and after teacher education and training)	T_{mt}
Principal	Principal ID [n]	Principal inputs (similar to teacher inputs): Leadership practices	P_{nt}
School	School ID [kl]	School inputs: Professional development Teacher autonomy vs. collaboration	S_{klt}
District	District ID [l]	District inputs: Financial resources District/school control over school budget and staff hiring	D_l

Table 2. DPI Staff

DPI Personnel	*Responsibility*
DPI Administrative Staff/Cabinet	Elizabeth Burmaster, Superintendent. Margaret Planner, Assistant Superintendant. Rick Grobschmidt, Assistant Superintendant. Lynette Russell, Office of Education Accountability*. Maxine Hough, Title I Director. Brian Wilmot, DPI Chief Information Officer.
Project Director	(Area of need) The project director will lead in driving the quality data warehouse effort forward. The project manager will be regularly and personally involved, and will serve as the ultimate authority for data warehouse planning and implementation strategies, as well as collaboration with all parties collaboratively involved in deliverables.
IT Technical Lead	Phil Koenig, DPI Technical Services Manager*. Provides overall technical direction and coordination.

Database Administrator	Gorm Heilskov, Database Administrator*. The database administrator is the physical implementer, and will protect the integrity of the database design, the business data, and the access points.
Other IT Staff	Applications/Development staff under Tiffany Boyd, DPI Applications Development Manager.* Jeff Jonietz, Senior Applications Developer*.
Data Custodians	Subject area experts in various disciplines—unassigned. Develop competencies in technology associated with statewide initiatives. Named data stewards. Policy related offices will also be represented. These include: **Office of Educational Accountability** - Lynette Russell, Director*, Bradley Carl*, Par Jason Engle*, and consultants; **Library and Statistics** - Kay Ihlenfeldt* and Jim Bennett*. Kay and Jim are active in leading the current **Data Dictionary Team** under Brian Wilmot (CIO), and under consultation from Minnesota. Par Jason Engle represents OEA on this team. **Other departments'** representatives include: Michael G. George, Michael Thompson, Stephanie Petska, David R. Carlson, Kathryn Lind, Michael Bormett, Richard A. Mortensen, David C. Dees.
Internal Data Committee	Chair, Kay Ihlenfeldt. While offering assistance with the overall project, this group will provide guidance toward the goal of maximizing compatibility of the department's data resources.
SSEDAC	The State Superintendent's Educational Data Advisory Council. Chair, Brian Wilmot. Offer advice and consulting to the department in the planning and implementation of the data architecture and warehouse effort.
Statewide Project Team	Selected school districts/CESAs chosen as statewide representatives to test and pilot the end-product for functionality, ease of use, and appropriateness to local needs.
End Users	Provide input from the user prospective to establish, monitor, and adjust expectations. Initially, this will included data teams at DPI, but will be expanded to larger stakeholder groups.
Vendor(s)	The architecture will strive to be vendor neutral. Eventually, DPI will evaluate vendors and select among them according to appropriate fit to the tri-state consortium's goals, but current vendors will be involved to some degree in this project.

**Resumes Available in Resume Section of Application*

Table 3. WCER Staff

Person	Title	Areas of Expertise
Management Team		
Robert H. Meyer, Principal Investigator	Director, Value-Added Research Center	Value-added and longitudinal models; statistical program evaluation models; education policy; transcript standards
Chris Thorn	Director of Technical Services	Decision support systems; mixed qualitative and quantitative methods; large-scale program evaluation
Eileen Kellor	Project Manager	Human resources and labor relations; project and conference management
To be named	Project Coordinator	Project and web administration
Information Technology and Statistical Computing Team		
Douglas Bates	Professor, Department of Statistics	Statistical computing with large datasets; nonlinear mixed effects models; core contributor to R language for statistical computing
Chris Fassnacht	Director of e-Services, WCER	Engineering and programming; web-based applications; digital media
Robert Glover	Database Applications Architect, WCER	Applications developer for enterprise-scale, complex database systems
David Sleasman	Webmaster, WCER	Knowledge manager; web designer
To be named	Graduate Project Assistant	Programming; database management
Research and Applications Team		
Julie K. Underwood	Dean of the School of Education	School law; state and national educational policy; teacher education
Adam Gamoran	Director of WCER and Professor, Department of Sociology	Sociology of education and organizational analysis; multi-level statistical analysis; program evaluation
Daniel M. Bolt	Associate Professor, Department of Educational Psychology	Psychometrics and latent variable modeling; item response theory
Eric Camburn	Assistant Professor, Educational Leadership and Policy Analysis	Statistical and measurement models; large scale studies of education
H. Gary Cook	Embedded Research Manager, Milwaukee Public Schools, and Assistant Scientist, WCER	Data-driven decision-making in schools and districts; test theory; federal and state education policy
Richard Halverson	Assistant Professor, Educational Leadership and Policy Analysis	Data-driven instructional systems; educational leadership; learning sciences
Allen Long	Graduate Project Assistant	Econometrics; economics of education
Anthony T. Milanowski	Assistant Scientist, WCER	Human resource management; standards-based teacher evaluation
John Smithson	Research Associate, WCER	Developer of Surveys of Enacted Curriculum; web-based data collection
To be named	Researcher, WCER	Data analysis models and software

Table 4. Project Recommendations by CCSSO/DSAC

Project No.	Project Name	Project Description
Project 1	Data Management Services Strategy and Master Plan	Develop a broadly supported plan through the involvement of key stakeholders from within the Wisconsin DPI and also by including representative LEAs and CESAs, helping to define the state's overall approach to data-driven decision making and data management. The key deliverables from this process would include an action/project plan for SEA data management and decision support systems, a high-level process design, a high-level technical and systems design, and a governance process that addresses: (a) policy; (b) data stewardship; and (c) day-to-day data project and service management.
Project 2A	Data Warehouse/Data Mart Platform	Construct a data warehouse that stores the historical/time-stamped data concerning student information, student assessment, educator/staff job history, certification, financial data, and so forth. Subsets of data by LEA and school should also be made available. Project will involve data modeling, data validation and cleansing, data transformation, and data transfer.
Project 2B	Data Reporting and Analysis Platform	Construct a user-friendly tool set for self-directed data selection, analysis, and presentation by end users. The resulting service will allow stakeholders to select and analyze subsets of state data based upon their respective roles and permissions, and to produce standard and ad hoc reports as needed.
Project 3	Instructional Process System	Establish an integrated, comprehensive, web-enabled Instructional Process Portal (ISP) that provides all SEA, LEA, and CESA stakeholders with a vehicle to deliver instructional improvement. The ISP would include standards, and an instructional management system that would allow teachers and districts to maintain lesson plans and units; high quality juried materials linked to standards that can be shared among districts; benchmark assessments; and simple data analysis tools to support instructional improvement
Project 4	Teacher Certification	Reengineer and streamline the existing processes around a single unified system database structure that relies upon a new underlying certification application tied to the envisioned WDPI ESP.
Project 5	Grants Management	Reengineer and streamline the existing processes around a single unified system database structure that relies upon, where appropriate, the Wisconsin DPI operational data store for current student information, etc., and that allows for the tracking of state and federal grants within one unified online, web-enabled system.

Project No.	Project Name	Project Description
Project 6	Web-based Delivery and Storage System for Assessment	This project should be initiated with a feasibility study and a pilot project. The ultimate web-based assessment system will include three parts: • Reliable items linked to standards that teachers can choose to use to address classroom level tests • Benchmark assessments that can be used throughout the year to allow schools to gather formative data on student progress in learning standards, and enable mid-course corrections in instructional strategy. • Online delivery of the annual CRT test. The proposed system will be voluntary, addressing administrative problems with the current testing system, as well as providing an information feed into the data warehouse that can allow for the analysis of trend data.
Project 7	Project Management Office and Balanced Scorecard Process	For the Wisconsin DPI IT organization, in partnership with the agency's program offices, create a single unified plan for the management and oversight of decision-support projects to ensure the alignment of schedules, resources, project dependencies, and personnel, as well as the delivery of an architected solution set. Also, create a governance process that involves and commits all key stakeholders. To enable WDPI and its stakeholders to successfully deliver the aforementioned decision support system projects, DSAC could provide support and assistance to DPI in associated IT architectural design, project management, and project delivery.

Madison Area Technical College

Bettsey Barhorst
President

June 22, 2005

Elizabeth Burmaster, State Superintendent
Department of Public Instruction
125 S. Webster Street
P.O. Box 7841
Madison, WI 53707-7841

Dear Superintendent Burmaster:

Madison Area Technical College supports your proposal to build a longitudinal data system to support data-driven decision-making in the PK-12 educational system and the larger PK-16+ system. Those of us committed to addressing the real-world educational challenges need answers to practical questions about the programs and policies that enhance the productivity of the PK-16+ educational system and make a difference for our young people. By constructing a longitudinal data system to track student outcomes and educational experiences, your project will make it possible for schools and teachers to position themselves at the cutting edge of innovative educational practices.

The project to build a PK-12 longitudinal data system is a crucial part of the larger effort to construct a longitudinal data system that extends from pre-kindergarten through postsecondary education. This data is essential to be able to document the link between teacher preparation, teaching practices, and student learning. We understand that work is progressing with the recently appointed Value Added Workteam of the UW System PK-16 Initiative to explore the feasibility of using PK-12 longitudinal data to document the experiences and student-related outcomes of teachers after they enter the teaching profession. In the past, we have not had the opportunity to use this information as a tool for enhancing the quality of our teacher education programs.

It is our understanding that your project is a multi-state collaboration involving Michigan, Minnesota, and Wisconsin and that you intend to work cooperatively with other states in the development of national data dictionary and warehouse standards. It would be highly useful to link PK-12 and postsecondary data for all students, regardless of their state-by-state enrollment patterns.

We are pleased that you are undertaking this project. It is a vital step in the process of building a larger PK-16+ data system that will enable PK-12 and higher education to work together to provide high-quality educational experiences for all students.

Sincerely,

Bettsey L. Barhorst

Bettsey L. Barhorst, Ph.D.
President

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UNIVERSITY OF WISCONSIN SYSTEM

Executive Senior Vice President

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1220 Linden Drive
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email: dmash@uwsa.edu

June 28, 2005

Elizabeth Burmaster, State Superintendent
Department of Public Instruction
125 S. Webster Street
P.O. Box 7841
Madison, WI 53707-7841

Dear State Superintendent Burmaster:

I am pleased to express my support for your proposal to build a longitudinal data system to support data-driven decision-making in the PK-12 educational system and the larger PK-16+ system. Those of us committed to addressing the real-world educational challenges need answers to practical questions about the programs and policies that enhance the productivity of the PK-16+ educational system and make a difference for our young people. By constructing a longitudinal data system to track student outcomes and educational experiences, your project will help our schools and teachers position themselves at the cutting edge of innovative educational practices.

The project to build a PK-12 longitudinal data system is a crucial part of the larger effort to construct a longitudinal data system that extends from pre-kindergarten through postsecondary education. The University of Wisconsin System recognizes that this data is essential to document the link between teacher preparation, teaching practices, and student learning. I am pleased that Robert Meyer, a key member of your project team, is working with the recently appointed Value Added Workteam of the UW System PK-16 Initiative to explore the feasibility of using PK-12 longitudinal data to document the experiences and student-related outcomes of teachers after they enter the teaching profession. In the past, we have not had the opportunity to use this information as a tool for enhancing the quality of our teacher education programs.

I appreciate that your project is a multi-state collaboration involving Michigan, Minnesota, and Wisconsin and that you intend to work cooperatively with other states in the development of national data dictionary and warehouse standards. This is important because UW System draws students from all over the country. It would be highly useful to be able to link PK-12 and postsecondary data for all students, regardless of their state-by-state enrollment patterns.

I am pleased that you are undertaking this project. It is a vital step in the process of building a larger PK-16+ data system that will enable PK-12 and higher education to work together to provide high-quality educational experiences for our students.

Sincerely,

Donald J. Mash
Executive Senior Vice President

MILWAUKEE PUBLIC SCHOOLS

OFFICE OF THE SUPERINTENDENT
CENTRAL SERVICES BUILDING
5225 West Vliet Street
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Milwaukee, Wisconsin 53201-2181
Area 414: 475-8001
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June 29, 2005

Elizabeth Burmaster, State Superintendent
Department of Public Instruction
125 South Webster Street
P.O. Box 7841
Madison, WI 53707-7841

Dear Superintendent Burmaster:

I am pleased to express my support and the support of my colleagues for your proposal to build a state longitudinal data system to support data-driven decision-making at all levels of the educational system. By constructing a state longitudinal data system to track student outcomes and educational experiences, your project will make it possible for schools and teachers throughout the state to monitor the progress of all students and create a climate of continuous school improvement.

I am proud that MPS has been one of the nation's leading practitioners of data-driven decision-making. Working collaboratively with Dr. Robert Meyer and the Wisconsin Center for Education Research, we have developed a sophisticated value-added system that is integrated with the accountability provisions of NCLB and is a key component of the MPS school report card system. With the generous support of the Joyce Foundation, we are currently working with WCER to implement an expanded value-added and program evaluation system that will: (1) identify schools and programs that are particularly successful with low achieving and disadvantaged students, (2) identify instructional practices that are most effective in the district, and (3) provide diagnostic reports to teachers and principals that will identify their educational strengths and weaknesses and provide options for increasing productivity. We also plan to work with higher education institutions, including the University of Wisconsin System, so that we can link to the student data needed to track student performance beyond high school.

Your proposal to build a state longitudinal system, working in partnership with Michigan and Minnesota, is timely. Recently, we have teamed with Minneapolis, WCER, and other districts to develop a national "Value-Added Network" to support districts and states in their efforts to promote high-level longitudinal analysis and data-driven decision-making. We are very pleased that you, Michigan, and Minnesota are joining us in this effort and are committed to building multi-state data warehouses that will eventually extend from pre-kindergarten through post-secondary education. Given the high incidence of inter-district and inter-state student mobility, we realize that it will be possible to track the progress of mobile students over time only if compatible state and multi-state data warehouses are constructed. We are eager to support you in this endeavor and eager to draw on the state-wide student data that you are in a unique position to assemble.

Sincerely,

William G. Andrekopoulos
Superintendent of Schools

Deborah Lindsey
Director, Division of Assessment and Accountability

James Davis
Director, Division of Technology

COOPERATIVE EDUCATIONAL SERVICE AGENCY #1

CESA #1
19601 W. Bluemound Rd., Ste. 200
Brookfield, Wisconsin 53045-5931

262-787-9500 • FAX 262-787-9501
website: www.cesa1.k12.wi.us

June 28, 2005

To Whom It May Concern:

On behalf of CESA #1, I am writing in support of the grant application of the Wisconsin Department of Public Instruction and their collaborative state partners from Minnesota and Michigan for the STATEWIDE LONGITUDINAL DATA SYSTEM GRANTS.

The purpose of this program is to provide grants to enable state agencies to design, develop, and implement statewide longitudinal data systems to efficiently and accurately manage, analyze, disaggregate, and use individual student data.

CESA #1 represents a diverse population of students and teachers in southeastern Wisconsin comprised of 45 school districts serving 270,000 students from single K8 rural districts to the 3 largest urban districts in the state.

In 1998, Milwaukee Public Schools, the largest school district in Wisconsin (a member of CESA #1) began an ambitious project to implement a data warehouse for collecting and maintaining longitude data about the students (demographics, performance, education programs) to help support decision-making at district, school, and classroom levels; and facilitate research needed to eliminate achievement gaps and improve learning of all students. At that time Milwaukee Public Schools was one of the first large city school districts to build a student data warehouse.

Information was gathered from a broad cross section of stake holders (teachers, principals, district administrators, and parents) through focus groups. A student centered data model was created and the warehouse was implemented using an Oracle environment. The warehouse is operational and used daily in Milwaukee Public Schools for the last 4 years with longitude student data of more than five to seven years in some areas. Two of the main architects of this project, Bob Nelson (retired, Director of Technology, MPS), and Dr. Hemant Jain (TCS Wisconsin Distinguished Professor of MIS, School of Business, University of Wisconsin, Milwaukee) will be available to assist with the proposed effort as CESA #1 Consultants.

Additionally, about four years ago, Milwaukee Public Schools, started a project to implement a Portal with support from the Joyce Foundation and partnerships with Harvard Graduate School of Education, SRI, local institutions of higher learning, community, and union representation. The district undertook a systemic and systems approach to implementation.

The objectives of the portal:

- To create a consistent and reliable information knowledge base.
- Create an online professional learning community focused on improving student achievement.
- Induction and retention of new teachers and administrators.

The portal builds capacity across the region's educational community to focus on improving learning outcomes for children by creating a consistent, common environment for educators to communicate and share information. This is a scalable solution using industry proven platforms that can scale to deliver state/multi-state services.

The project lead for the development and implementation of portal, Kathy Onarheim, along with Bob Nelson, and Dr. Hemant Jain, will be available to assist with the implementation of the proposed project through CESA #1.

Sincerely,

Timothy C. Gavigan

Timothy C. Gavigan, Ph.D.
Agency Administrator

Cooperative Educational Service Agency 5
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Portage, Wisconsin 53901-0564
CESA Office (608) 742-8811
FAX No. (608) 742-2384

FROM THE AGENCY ADMINISTRATOR

DON STEVENS

June 24, 2005

REC'D JUN 29 2005

Elizabeth Burmaster, State Superintendent
Department of Public Instruction
125 S. Webster Street
P.O. Box 7841
Madison, WI 53707-7841

To Whom It May Concern:

As a member of the State Superintendent's Advisory Council on Rural Schools, Libraries and Communities, I know how the special challenges of our state's rural schools must be advanced in the context of setting state education policy. We have been very pleased to work closely with the State Superintendent and others from the Department of Public Instruction in developing and advancing a series of policy issues that will make a difference to students and families in our state's rural areas.

There are many reasons why rural Wisconsin schools should be encouraged by the proposal that has been developed to improve our use of data for decision making purposes through the development of a new longitudinal data system.

Efforts to secure grant funding for technological improvements offer tremendous potential for all schools, but will impact the rural schools in ways that are not always fully understood when you look at developments from a statewide perspective. Our rural schools face extreme fiscal constraints. We have many individuals working very hard to perform duties and provide services that are more fully staffed by larger school districts by multiple persons or entire offices.

The ability to use and access longitudinal data will help us to understand changes in student performance and to conduct more comparative reviews of our educational efforts. Such a new facility will ensure that rural schools have the tools required to help promote high quality learning for all students, in all schools.

This proposal is envisioned as a key part of a broader commitment to improve educational quality at all grade levels, and through all school systems (public elementary and secondary, technical college and UW System). It is also encouraging that this effort joins our state's efforts with those of our colleagues and counterparts from Michigan, and Minnesota.

As we look to pursue efficiencies in internal operations, we know that increased reliance on technology can help our staff to complete required reports and gather pertinent information easier or more efficiently. The strong partnership that is envisioned under the agency's proposal will help build new capacity – and new resiliency – in schools all across our state.

Ensuring that we have considered the "research component" at the front end of our pursuit of this funding will help to guide our efforts to make certain that we are advancing the needs and interests of all students, in all school districts.

Wisconsin's rural schools face difficult challenges, but the abilities of our teachers and the performance of our students and schools helps us to be successful in fulfilling our educational mission. We see in this grant proposal the opportunity to build upon this established record of achievement while also helping to address key technological issues that should improve both quality and efficiency.

Sincerely,

Donald L. Stevens

Donald L. Stevens
Agency Administrator

CESA 5