



**MINNESOTA DEPARTMENT OF EDUCATION
LONGITUDINAL DATA SYSTEMS TO SUPPORT DATA-DRIVEN DECISION-
MAKING**

Project Start Date: 02/01/2006

Project End Date: 01/31/2010

Amount Awarded: \$ 3,272,448

This project represents a partnership between Minnesota, Michigan, Wisconsin and the Wisconsin Center for Education Research (WCER) to build a comprehensive multi-state longitudinal data system (LDS). The vision is that this system will enable educational stakeholders to conduct value-added and other diagnostic and policy-relevant evaluation research and engage in data-driven decision-making. The ultimate goal of this collaboration is to improve student achievement for all students and all schools. In order to achieve these goals, the 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 it is expected 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 project is that it reflects a genuine collaboration between Minnesota, Wisconsin, Michigan and the WCER. By structuring work products so that they can be shared across the Tri-State Partnership, these products will be of value to states that are not explicitly part of the 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.

In 2005, the CELT Corporation in conjunction with the Council of Chief State School Officers (CCSSO) conducted a comprehensive review of Minnesota's information infrastructure. CELT identified a need for improved real-time student identification systems, longitudinal data analysis systems, and researcher portal access. The Minnesota Department of Education began strategic planning to address these needs, and created a plan that included development of a Data Portal, a Data Warehouse, and Linked Data Sets.

With the award of the grant from the U.S. Dept. of Education's Institute of Education Sciences (IES), the Minnesota Department of Education will work with a multi-state partnership with the Michigan Department of Education and the Wisconsin Department of Public Instruction. These states will cooperate, leverage, and share work in five key areas: Data Dictionary, Data Warehouse, Secure Data Transport, Data Access Policy, and Data Analysis. The emphasis in each area will be on providing educational researchers with longitudinal data used in decision support for improving student learning. The Minnesota Department of Education will fully collaborate in every aspect of the shared strategic plan, with particular emphasis on the Data Warehouse, Data Dictionary and Secure Data Transport.

The project has been divided up into distinct functional task areas: data analysis and research requirements, data access, data dictionary, data warehouse, and secure data transport.

Data Analysis and Research Requirements

In order to 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 their own stakeholders.

Data Access

The tri-state group plans to develop metadata structures that store access roles directly in the data dictionary for policies that are common across all organizations. These would reflect written documents that are approved by data access policy review teams with each state.

Data Dictionary

This project seeks to facilitate the development of a shared data dictionary for use in cross-state longitudinal data analysis. Minnesota will be a leader in the tri-state consortium in this area.

Data Warehouse

The warehouse design will be based on metadata models that conform to federal standards which should scale well for all three states. Minnesota has launched a data warehouse initiative and has pilot test and assessment data available internally. This initiative includes a vision for an enterprise directory and security system within an interoperable framework.

Secure Data Transport

This project will expand on work done by School Interoperability Framework (SIF) and other industry standard interoperability procedures. Minnesota's application system architect will take a leadership role in providing design and staging models for the partner states with this component.

Minnesota has identified three strategic goals that will focus the restructuring of the information technologies services over the next five years.

- **Data Portal** Minnesota will design an instructional portal to provide integrated access to decision support tools for data-driven decision making. This portal will include password protected security access for a variety of users including parents, educators and researchers while maintaining appropriate confidentiality of data sets. Data access policies will be developed to permit standardized role definitions. User needs will be researched to identify the most useful reports and data analysis options for each user group.
- **Data Warehouse** Data accessed through this portal will be stored in a warehouse based on an enterprise wide architectural design and will eventually house all of the educational data at the state. The warehouse design will include an enterprise level data dictionary, automated editing procedures and vendor neutral open-architecture standards to support interoperability frameworks. The use of national interoperability standards will facilitate data exchanges and transfer among districts within Minnesota, from districts to the state and among partner states.
- **Linked Data Sets** The data warehouse will have the capacity to include both traditional empirical data sets to support quantitative research and additional survey data to support qualitative research. Student level data will be linked to unique identifiers that can be verified and authenticated at the district level to promote accuracy in longitudinal data analysis. Through this project they will research and begin implementation of policies and procedures necessary to link student information to teachers and subjects taught. The addition of qualitative data sets will permit educators and researchers to further explore contextual educational practices and study their impact on student achievement and reducing gaps among different subgroups.

In addition, future work that will be implemented that is related to this grant effort will be the development of common data collection systems and infrastructures, and enterprise level security frameworks to support data policy and privacy. The Minnesota Department of Education intends to match that with \$3,600,000 in kind funding during this same grant award period.

In conclusion, 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. It will ensure that the resulting system is robust enough to meet the needs of various user groups, including students, parents, teachers, educational administrators, policy makers and researchers across states.

Minnesota is excited about this opportunity to work in partnership with Michigan, Wisconsin and the WCER to build a comprehensive multi-state longitudinal data system. 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.”