



WCER Highlights

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Turning data into knowledge



Better use of student performance data can help schools plan and make decisions.

Data-based decision-making is an important tool for educational improvement. Yet, WCER researchers Bill Clune and Norman Webb remind us that making effective use of data is one of the continuing challenges of building capacity in systemic reform. In order to use data as a guide for continuous improvement around coherent goals of student achievement, schools must develop their organizational, technical and analytical capacities.

Effective use of school data requires planning and persistence. Data development and use must become an active part of school planning and improvement processes, and it must become infused and accepted into the school culture and organization.

With funding from the Joyce Foundation, Clune and Webb are working with school and district staff in the Milwaukee Public Schools (MPS) to develop the capacity of staff to understand and apply data strategically, using QSP (Quality School Portfolio) software, an analytical and reporting tool developed at UCLA by the National Center for Research on Evaluation, Standards, and Student Testing (CRESST). Once fully integrated into a school's systems, data can be transformed from mere numbers to useful information, and can then contribute to schools' and district knowledge in effective and meaningful ways.

WCER Highlights



Winter 2001-02
Vol. 13, No. 4

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FROM THE DIRECTOR



A breadth of research

Like last issue, this *Highlights* speaks to the interests of preschool through university level educators.

Data-based decision-making is an important tool for educational improvement. To use data as a guide for continuous improvement, schools must develop their organizational, technical and analytical capacities. WCER researchers are working with school and district staff in the Milwaukee

Public Schools to develop staff capacity to apply data strategically.

Knowledge- and skills-based pay is an innovative, and potentially effective, way to compensate teachers for what they know and can do. WCER research is evaluating how alternative pay systems might be used to better focus teacher development and build capacity for improved practice.

Most young children spend at least some time in nonmaternal care before they enter kindergarten or first grade. Parents and policymakers are raising important concerns about the quality of these child-care arrangements—about what kinds of care children are receiving, and what structural and caregiver characteristics are linked to the quality of care. WCER research is finding answers to important questions about child care quality.

The academic life is challenging. Faculty and staff continually seek information about teaching in particular and academic community in general. An innovative program, *Creating a Collaborative Academic Environment*, aims to advance human resources at the undergraduate and graduate levels on the UW–Madison campus.

For more information, visit the WCER Web site at www.wcer.wisc.edu.

Andy Porter



Clune

Milwaukee educators involved in the project consistently mention the need to develop a process and the skills to analyze and use data for answering questions, problem-solving, monitoring and decision-making. During the last two years, WCER researchers and the school staff have collaborated in developing analytical models and decision-making processes, collecting and managing data, and analyzing, reporting and applying data.

Clune and Webb have found that using data to support inquiry, to inform schools' instructional mission and continuous improvement requires coordinated changes in many areas—school processes and culture, use of technological tools, data collection and management, and the analytical skills and abilities of school personnel.

The school teams have found that making the needed changes to implement data-based decision making poses difficult, but not insurmountable, challenges. With hard work, each school has made progress toward meeting many of the challenges.

For example, one school analyzed multiple measures of individual student data generated at the school site to evaluate or monitor student performance changes in reading, programs, student placement, etc. After reviewing the information, the principal and teacher leadership team decided on a course of action.



Webb

For the subsequent school year, they reallocated school resources in reading, identified low-performing students to receive additional reading resources, and hired two new reading specialists. Team members are tracking these interventions this year to see whether the students' reading performance improved.

Another school began to analyze what staff called "event-based" data—that is, data that refer to specific incidents or actions, rather than to test scores or student demographic variables. Tracking the pattern of events such as discipline referrals and attendance infractions, the principal provided summary information to teacher teams. School staff used these summaries to discuss student behavior and related teacher behavior management practices. The data were also used to support decisions about resource allocation. The school hired an additional counselor for the following school year to help students who had difficulties in their lives outside of school, which staff concluded affect student behavior.

Building capacity

Clune and Webb identified six challenges schools face as they build capacity for using data-based decision making:

- ▶ Cultivating the desire to transform data into knowledge
- ▶ Focusing on a process for planned data use
- ▶ Committing to the acquisition of data
- ▶ Organizing data management
- ▶ Developing analytical capacity
- ▶ Strategically applying information and results

Strong leaders who support the local use of data help establish a school culture that not only accepts the use of data but considers data as a source of information that contributes to problem solving and knowledge building. Whether key staff or the school principal provide the leadership, it is

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Most children receive “adequate” care

Out-of-home child care in America does not have a good reputation; parents and educators should know whether its negative reputation is deserved.

The majority of young children in the U.S. spend at least some time in nonmaternal care before they enter kindergarten or first grade. Of the 1,364 infants enrolled in the National Institute for Child Health and Human Development (NICHD) Study of Early Child Care, 80% experienced some regular nonmaternal care during their first 12 months. Almost three quarters (72%) entered that care prior to 4 months of age. Using the criterion of 10 hours of care per week, 74% of the infants experienced nonmaternal child care, with an average entry age of 3.3 months. With 30 hours per week as the criterion, 58% of the infants were in child care during the first year, with an average entry age of 3.6 months. At entry, children were in care for substantial hours, averaging about 29 hours of care per week.

Parents and policymakers are raising important concerns about the quality of these child-care

arrangements—about what kinds of care children are receiving, and what structural and caregiver characteristics are linked to the quality of care.

In an ongoing national study, UW Madison education professor Deborah Vandell and her colleagues study early child care with funding from the NICHD, U.S. Department of Health and Human Services. Based on information gathered in telephone conversations and site visits, they recently found answers to the following questions:

► *What structural features and caregiver characteristics predict more positive caregiver behavior in child care for 1- to 3-year-old children?*

Positive caregiving was more likely when child-adult ratios and group sizes were smaller; caregivers were more educated and held more child-centered beliefs about childrearing, and had more experience in child care; and environments were safer and more stimulating.

► *What differences in quality are associated with the type of child care and the child's age?*



Vandell



JEFF MILLER

Most young children in this country receive child care that leaves room for improvement.

childcare

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The highest level of positive caregiving was provided by in-home caregivers, including fathers and grandparents, caring for only one child. The next highest quality care was provided by home-based arrangements with relatively few children per adult. The least positive caregiving was found in center-based care with higher ratios of children to adults. By 36 months of age, however, the significance of the child-adult ratio decreased, and in-home arrangements became less positive.

► *What is the overall quality of child care for 1- to 3-year-olds in the U.S.?*

Results from the NICHD study suggest that most young children in this country receive child care that is "adequate"—neither outstanding nor terrible, but leaving plenty of room for improvement. Researchers used the observational instrument, Observational Record of the Caregiving Environment, which focuses on caregivers' behavior with a specific child rather than on what happens in the

setting at large. In the sites studied, positive caregiving was determined to be "highly characteristic" for 12% of the children, "somewhat characteristic" for 32%, "somewhat uncharacteristic" for 51%, and "very uncharacteristic" for 6%.

► *The strongest and most consistent predictor of observed positive caregiving for infants was the child-adult ratio.*

Caregivers provide more sensitive, frequent, and positive care when they are responsible for fewer children. Caregivers' education also predicts quality of care and is increasingly important for older children.

Vandell says parents are well advised to select care arrangements that are characterized by a low child-adult ratio, a clean and orderly physical environment, a variety of toys and learning materials, and a caregiver with a college education.

For more information, contact Deborah Vandell at dvandell@facstaff.wisc.edu.

[Material for this story was adapted from the article, "Characteristics and Quality of Child Care for Toddlers and Preschoolers," in *Applied Developmental Science*, vol. 4, no. 3, 2000.]

JEFF MILLER





CCAIE promotes community

The academic life is challenging, and without networks of support can seem daunting. Faculty and staff continually seek information about teaching in particular and academic community in general. What can be a lonely process is made more pleasant and more productive by an innovative program that originated on the UW–Madison campus.

Creating a Collaborative Academic Environment (CCAIE) focuses on advancing undergraduate and graduate learning and nurturing faculty and staff to develop citizenship, equity, and diversity across campus. Directed by Catherine Sanders and associate director Chris Carlson-Dakes, the program is funded through the UW Foundation and the Hilldale Trust Fund.

CCAIE helps faculty and staff build community across disciplines, creating supportive professional relationships that nurture the quest to improve teaching and learning and to develop community. Participants come together to work in small groups to question and test personal beliefs and create new approaches to work.

CCAIE's small-group settings elicit conversations about a variety of challenging issues in addition to teaching and learning—for example, approaches to inquiry and research, leadership, inclusivity and diversity, and community service.

CCAIE creates opportunities for personal growth that complement skill-based training programs. "These efforts are based on theories of organizational change and job design," Sanders says. "CCAIE helps individuals to find their place at UW–Madison, to clarify their role in its community, and to become leaders and contributors to the campus vision." Many CCAIE participants have gone on to become leaders in teaching, research, and administration across campus.

One CCAIE project, *Creating a Collaborative Learning Environment*, has taken root at the University of South Australia and at Texas A&M University. A former participant observed, "CCLE has very supportive interactions and I've met the most progressive-thinking people. It's like a haven where I can actually explore these things in a safe place with people. It's the only place you can go to and think you actually do these things and make a difference. It's a very good essential place, because without that, none of [my rejuvenation about teaching] would have happened."

Other CCAIE programs

CCAIE complements the work of faculty development groups in several colleges on the UW–Madison campus. CCAIE originated in the College of Engineering in 1993 and has since developed partnerships with such faculty development groups as the Center for Biology Education, the Teaching Academy, the Wisconsin Engineering Education Laboratory, University Health Services, and the Equity and Diversity Resource Center.

This year, CCAIE is piloting its newest program, *Creating a Collaborative Research Environment* (CCRE). The idea grew out of the observation that one obstacle to interdepartmental collaboration is the fact that the disciplines speak different languages and make largely different assumptions about the world. Many faculty want to bridge this gap so they can grow beyond their established research area. This desire to reach out to other scholars across disciplines ask and answer questions in widely varying ways. By focusing on the underlying philosophies and approaches that disciplines use to frame their approaches to inquiry, CCRE aims to help faculty and research staff broaden their possibilities for inquiry.

A sister program, under development, is *Creating a Collaborative Service Environment* (CCSE). CCSE aims to help faculty and staff learn about the Madison community by engaging in community service projects. Just as faculty are expected to teach, conduct research, and serve, a central theme in CCSE is finding one's "calling" to serve. The assumption is that coming together to reflect on personal beliefs and motivations for making a better community of faculty can greatly magnify the potential for appropriate action and effective collaboration. CCSE assumes that through such an in-depth conversation university and community members can better understand each others' gifts, needs, and potential, instead of falling into stereotypes (for example, community members' seeing "experts" as well meaning but disconnected from community issues and lacking experience with implementation, or academics' seeing community members as lacking the expertise necessary to take action to help their own neighborhoods).

For more information, contact Chris Carlson Dakes at cgcarlso@facstaff.wisc.edu or visit the Web site at www.wisc.edu/provost/ccae/.



Sanders

Measuring instructional practice

Knowledge- and skills-based pay (KSBP) is an innovative, and potentially effective, way to compensate teachers for what they know and can do. An alternative salary approach, it aims to give teachers strong incentives for enhancing their capacity to teach students to high academic standards.

Under the leadership of Professor Allan Odden and project coordinator Anthony Milanowski, WCER's Consortium for Policy Research in Education (CPRE) is evaluating how alternative pay systems might be used to better focus teacher development and build capacity for improved practice, as well as helping to align district human resource management systems. Ultimately, this research hopes to show whether providing incentives for improved practice actually affects how teachers teach and the level of student achievement.

Implementing a performance-based evaluation system and a knowledge-and skills-based salary structure entails four steps. First, the district must adopt a set of teaching standards, for example, the Charlotte Danielson Framework for Teaching. The second step is to adopt a performance-based evaluation system for teachers, one that shows different levels of teacher performance, not just whether a teacher meets a low-benchmark for "satisfactory" performance. A third step is to structure the profes-

sional development system around the profiles of practice that assessment system provides for each teacher. The final step is creating a knowledge- and skills-based (KSB) teacher salary structure.

To evaluate the effect of such systems, researchers need some independent way to address teacher practice. A number of CPRE researchers from the Universities of Michigan, Pennsylvania, and Wisconsin are working on different research projects that need some measure of teaching. They recently met to discuss how to measure teacher instructional practice and some general conclusions emerged:

1. Instruments developed for use with KSB pay and evaluation systems need to be content-specific, at least to the extent of recognizing potential differences in effective practice among major knowledge domains such as math, language arts, and science.
2. There is not likely to be any one "language" for describing instruction that will meet the needs of all CPRE research projects. Such a unitary classification of instructional strategies would need to be sufficiently detailed to reflect important differences in teaching behavior, yet general enough for use across subjects and research projects. Such a taxonomy is unlikely to be available any time soon.



Knowledge- and skills-based pay and evaluation systems need to recognize potential differences in effective practice among various disciplines.



3. In measuring the content of instruction there are important issues of teacher recall. In short, just how frequently do teachers need to report on the content of their instruction if the goal is an accurate portrayal of an entire school year? Daily, weekly, semester, and year-end surveys have been used. Not surprisingly, the more frequent the survey the more accurate the description, but the less willing teachers are to do the task of providing the information. CPRE researchers have shown that even end-of-year surveys in mathematics provide sufficiently good information to predict gains in student achievement. Research and experience have shown that teachers can overestimate the degree to which their practice conforms to a particular reform model. Therefore, it is important that the instruments used do not make transparent the reform or intervention being measured. In other words, to ensure that teachers are accurately reporting about their practice, instruments should not use reform language or include only content related to the particular reform or intervention.



Alternative pay systems might be used to better focus teacher development.

4. The need to base the design of instruments on a specific intervention or theory of instruction, on the one hand, and the need to avoid direct reference to the intervention or theory of instruction, on the other, require instrument designers to focus on relatively specific, concrete behaviors.

A comprehensive system of measuring instructional practice must cover four domains:

- ▶ Content coverage (e.g., topics such as fractions, linear equations)
- ▶ Cognitive demand
- ▶ Classroom management and general pedagogy
- ▶ Content-specific pedagogy

Odden and Milanowski say it would also be useful to have a measure of teachers' pedagogical content knowledge, but such a measure would require a substantial amount of item development. Moreover, it is difficult to develop measures of pedagogical content knowledge that do not resemble a test, and teachers are less inclined to respond to instruments they perceive as tests of their own knowledge.

CPRE research is funded by a grant from the U.S. Department of Education, Office of Educational Research and Improvement; the Carnegie Corporation; Atlantic Philanthropic Services; and WCER.

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Milanowski



Odden



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WCER Highlights is published by the Wisconsin Center for Education Research, School of Education, University of Wisconsin–Madison. WCER is funded through a variety of federal, state, and private sources, including the U.S. Department of Education, the National Science Foundation, and UW–Madison. The opinions expressed in this publication do not necessarily reflect the position, policy, or endorsement of the funding agencies. Fourth-class, bulk-rate postage is paid at UW–Madison, Madison, WI. Send changes of address to WCER, 1025 West Johnson Street, Madison, WI 53706 or call (608) 263–4200. Include the address label from this issue.

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WCER Highlights is available on the Web at <http://www.wcer.wisc.edu>.

ISSN 1073–1822
Vol. 13, No. 4
Winter 2001–02

Data to knowledge

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essential for a school to gather support, obtain commitment, allocate resources, and identify goals to ensure that its data efforts are a success.

It is important for schools to link their use of data to their school planning and decision-making processes. Such a focused approach saves time and effort and allows for more efficient use of limited data. An approach that aligns data inquiry to school planning and decision-making processes right from the start is more likely to produce answers to specific questions, evidence to support school goals, and information that sheds light on identified problems. Planned and targeted data inquiry helps to keep data analysis on track, as well as ensure that information is fed back into the planning process and that key decision-makers get timely answers to their questions.

Data do not magically appear, ready made, to provide evidence of success and solve all of a school's problems. School staffs struggled to build the internal will, capacity, and organization to make data work for them. They had to learn where to get data, how to manage data, how to ask good questions of

the data, how to analyze the data accurately, and how to apply data results appropriately and ethically.

The final challenge for schools is to learn how to appropriately apply results and make purposeful and ethical use of information for improving teaching and learning. Appropriate and ethical use of data implies that a school has taken the necessary precautions and steps to ensure that data is accurate, valid, and reliable, and that the analytical process is complete, equitable, and fair. If schools have followed a continuous improvement process for planning and decision-making, the results will be easily linked back to specific questions, goals, and problems. By focusing the data analysis to target specific issues, schools are poised at the end of the analytical process to make sense of and draw meaning from results. The final step is to share the new information and results with staff to inform school planning and decisions. The results can be used in a variety of ways—to identify progress, explore problems, and target strategies for change, to mention a few. In this manner, schools successfully transform data into information and apply that information to school improvement.

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