



# WCER RESEARCH highlights

WISCONSIN CENTER FOR EDUCATION RESEARCH • SCHOOL OF EDUCATION • UNIVERSITY OF WISCONSIN-MADISON • WWW.WCER.WISC.EDU



## Value-Added and Other Measures of Teacher Quality: Policy Uses and Policy Validity

School districts, individual schools, and education policies all contribute to student achievement. But it can be argued that the most important contributing factor is the quality of the teacher in the classroom. Evaluating teacher quality is complicated, yet it has become even more important with the testing and assessment focus of No Child Left Behind (NCLB).

Teacher quality traditionally has been measured by considering 'teacher characteristics,' for example, the teacher's academic degrees, personality, and professional development activities. Recently, though, researchers and policy makers have begun to embrace a 'value-added' approach to measurement. This set of statistical methods offers a more objective and more precise way

to measure the value that teachers, schools, and districts add to students' educational experiences.

But UW-Madison education professor Douglas Harris<sup>1</sup> cautions that measuring teacher quality cannot result from choosing between the traditional 'teacher characteristics' measure nor a simple value-added measure.

Instead, it's necessary to use multiple measures, including formative and summative assessments. Evaluating and improving teacher quality requires a comprehensive strategy that few current or proposed policies provide, Harris says. Evidence suggests that teachers should be rewarded not for their graduate degrees, but for a combination of experience, certain types of professional development, teacher value-added and school value-added.

*(continued on next page...)*

### CONTENTS

**4** Personal Stories Show CIRTl's Commitment to Diversity  
BY CATHERINE FRIEDRICH

**6** Use of Dollars after a School Finance Reform, Part 3





### FROM THE DIRECTOR

Adam Gamoran

In my new book, *Standards-based Reform and the Poverty Gap* (Brookings, 2007) my colleagues and I argue that the No Child Left Behind (NCLB) Act will fail to improve learning for disadvantaged students unless strategies for improving schools and teaching are implemented more effectively. This issue of Research Highlights presents WCER research that offers new insights on strategies to promote better teaching and learning.

For example, NCLB requires districts to place a “highly qualified teacher” in every classroom. But what’s the best way to measure teacher quality? Douglas Harris and colleague Tim Sass report that evaluating and improving teacher quality requires combining traditional ‘teacher characteristics’ measures and different kinds of value-added measures.

The best teachers know how to adapt their instruction to students’ diverse learning styles. The diversity project within WCER’s Center for the Integration of Research, Teaching and Learning is part of a national network of research institutions is dedicated to improving the preparation of future faculty in science, mathematics, engineering, and technology fields and improving their ability to teach students of all backgrounds.

NCLB aims to reduce the achievement gap, which is particularly pronounced for students who face economic disadvantages. Allan Odden argues that increasing school-level control over budgeting, hiring, and curriculum would enable schools to better target resources to appropriate programs and services. This issue includes the third in a four-part series from WCER’s Consortium for Policy Research in Education.

NCLB emphasizes reading and mathematics over social studies and science. Yet reading, writing, and communicating are essential aspects of helping K-12 students construct science understanding. Sadhana Puntambekar’s hypertext system, CoMPASS, integrates informational text, in the form of ‘concept maps,’ into science classes to complement hands-on science activities.

Adam Gamoran  
WCER Director  
Professor, Sociology and Educational Policy Studies



Current proposals shift away from the traditional ‘teacher credentials’ strategy in favor of a value-added accountability strategy. That is warranted, Harris says, but it’s possible to go too far. New policies will fail if they only reinforce the limitations of the status quo, rather than facilitate innovation and success. Harris advocates an evaluation framework he refers to as “policy validity” which involves multiple measures.

### Program evaluation and accountability

Harris distinguishes between two kinds of value-added measures. Value-added modeling for program evaluation, or VAM-P, identifies the correlations and effects of teacher characteristics, such as their education and professional development. Some of his findings about VAM-P are:

1. Most measures of formal teacher education, especially graduate degrees, appear unrelated to teacher value-added.
2. There is some evidence that “pedagogical content knowledge” is associated with teacher effectiveness.
3. Teacher experience consistently and positively associates with teacher effectiveness, at least for the first several years.
4. Teacher test scores are inconsistently associated with teacher value-added.
5. Various forms of teacher certification, including National Board certification, are inconsistently associated with teacher value-added.

Value-added modeling for accountability, or VAM-A, identifies the effectiveness of each individual teacher as measured by student achievement on standardized test scores. Harris’s findings regarding the validity of VAM-A:

1. Value-added varies considerably across teachers.
2. Teacher value-added positively correlates with other measures of teacher effectiveness, especially structured and unstructured principal evaluations.

These first two findings are good news for VAM-A but, as Harris argues, there is also some bad news:

3. Teacher value-added scores are imprecise.
4. Individual teacher value-added changes considerably over time. This “instability” in the measures is a problem because there is no reason to believe that actual teacher effectiveness varies as much as the measures sometimes indicate.

Overall, Harris concludes that there are clear advantages and disadvantages to using accountability measures versus credentials. Although VAM-P yields fairly precise estimates of the effects of teacher credentials, these effects are small, and they explain little of the total variation value-added. In contrast, the VAM-A measures are imprecise, but they imprecisely measure what is of greatest interest. Also, to the degree that student test scores can and should be used to evaluate teachers, VAM-A is better than the alternatives.

## Policy implications

Harris points to conclusions that stand out:

- There is good reason to give weight to teacher experience when determining teacher compensation and certification.
- The master's degree appears to receive too much weight. Instead of paying teachers based on the master's degree, perhaps schools and districts should use the degree as one basis for promotion and taking steps up the career ladder, e.g., to the "master teacher" level. Master teachers have different responsibilities. Part of the logic is to require the degrees only when it seems plausible that the additional knowledge would contribute to the additional responsibilities.
- Some forms of professional development appear to improve teacher value-added. This suggests favoring teacher education based on the specific school contexts in which teachers find themselves, over more general education. Evidence shows that experience improves teacher value-added. Teachers learn partly by doing.
- To the degree that formal education can play a useful role, it appears that the focus on pedagogical content knowledge should be somewhat greater. Knowing content is not enough and knowing how students learn is not enough. The evidence suggests that teachers need a stronger grounding in how to teach specific subjects and grades. If formal teacher education were altered in this way it might do more to explain the variation in teacher value-added, and therefore be given greater weight as part of teacher quality strategies.
- Despite some of the limits of the credentials strategy, going to opposite extreme and focusing mainly on teacher value-added or another single measure of teacher effectiveness would be equally misguided. Improving teacher quality is complex and requires that teachers be evaluated fairly, encouraged to improve, and provided paths to ensure that they do get better in the classroom.

<sup>1</sup>Harris serves on the federal technical working group that advises TIF districts (the Teacher Incentive Fund), a voluntary pilot program by which the federal government encourages 'merit' or 'performance' pay approaches.



***Value-added modeling for accountability, or VAM-A, identifies the effectiveness of each individual teacher as measured by student achievement on standardized test scores.***

Policy and methodological aspects of VAM will be the focus of the National Conference on Value-Added Modeling, organized by Harris, Adam Gamoran and a group of non-UW researchers and sponsored by the Carnegie, Joyce, and Spencer Foundations at the University of Wisconsin-Madison April 23-24, 2008. For more information see [http://www.wcer.wisc.edu/news/events/natConf\\_08.php](http://www.wcer.wisc.edu/news/events/natConf_08.php).



For more information on Doug Harris's research, see [www.teacherqualityresearch.org](http://www.teacherqualityresearch.org) and his personal web site <http://www.education.wisc.edu/eps/faculty/harris.asp>.



**Doug Harris**



## Personal Stories Show CIRTL's Commitment to Diversity

By Catherine Friedrich, CIRTL staff

Engaging all students in science, technology, engineering, and mathematics is a priority goal for U.S. higher education. The Center for the Integration of Research, Teaching and Learning (CIRTL) seeks to contribute to this goal by enabling present and future STEM faculty to enhance the learning of all students whom they teach irrespective of preferred learning styles, race, ethnicity and culture, gender, sexual orientation, disabilities, religion, age or socioeconomic backgrounds.

An active interest in diversity unites the professional lives of many CIRTL researchers and students. This article introduces the work of Mark Connolly, Carol Colbeck, and Sarah Wright.

### A “Stone Soup” Model of Evaluation

Mark Connolly brings to his work a dedication to empowering colleagues and students. As a researcher for CIRTL, he believes in participatory evaluation—training his colleagues to evaluate their own programs.

Connolly's interests range across many university issues—from undergraduate life to faculty preparation. His appetite led him to pursue a master's degree and then a doctorate in programs related to higher education. “I absolutely love collegiate life,” Connolly says.

Throughout his career, Connolly has maintained a strong interest in diversity: His research has included a study of the cultural issues surrounding the use of Native American mascots and he has written about the undergraduate experiences of LGBT students.

Connolly's research on LGBT life on campus inspired him to title one of his new publications “Coming Out as a College Teacher at a Research University.” He compares the stigma of disclosing that one is more interested in teaching than in research to the stigma of revealing one's LGBT identity. “It's OK to be a teacher,” he says.

Although he is modest about his techniques, Connolly has a knack for creating inviting environments for participatory evaluation. His inclusive methods are having a positive effect within the Delta Program, CIRTL's learning laboratory on the University of Wisconsin–Madison campus.

As an evaluator, Connolly tries to “de-center” himself so that he becomes less essential to the process. Innovations are more likely to be sustained when many participants know how to do evaluation. “What really makes evaluation meaningful is to try to democratize it,” he says.

Part of Connolly's job is to help people “be comfortable... with being ignorant about evaluation,” he explains. Once he sets people at ease and invites them to participate, the results are much more effective than one person could produce alone.



Connolly compares the way he works to the children's story, "Stone Soup." He says that he is like the "charlatan" with the stone who encourages everyone else to add their vegetables to the stew.

### A Compassionate View of Faculty Work

CIRTL "sounded like it was written with my name all over it," says Carol Colbeck, a co-Principal Investigator for CIRTL. She is a professor and dean at the Graduate College of Education at University of Massachusetts-Boston.

"One thread throughout my faculty career has been an interest in underrepresented groups," Colbeck says. She and graduate student Stephen Quaye are currently conducting a study of CIRTL's diversity outreach. Colbeck has also coauthored studies on women in engineering with professor Alberto Cabrera of the University of Maryland.

Colbeck hopes that her work with the project will lead to international research collaborations focusing on the doctoral preparation of ethnic minorities, immigrants, and indigenous peoples.

She takes a compassionate and socially conscious approach to her study of faculty work environments and their effect on student learning. She brings insights from previous work with non-profit organizations to her research on the pressures faculty face. Faculty are sometimes blamed for "all of the ills in higher education" while the educational system continues to require that they focus on research more than on teaching. Colbeck sees a parallel between these ambivalent messages and the way that some public service agencies treat parents who have problems.

Colbeck studies how faculty achieve balance between research, teaching, community service and personal life, given the many demands on their time. "We're all whole people," Colbeck says.

### A Fusion of Diversity and Environmentalism

After working at an environmental newspaper, High Country News, Sarah Wright became attracted to biology education and graduate work. Through a job at a summer research opportunity program for ethnic minority students, she discovered that she wanted to incorporate diversity awareness into her teaching. Wright is now a graduate student in botany at the University of Wisconsin–Madison.

Enthusiasm for an environmental education and ethnic diversity inspired her to intern with CIRTL's Delta Program. She has conducted a series of outreach workshops based on the training program of the CIRTL Diversity Team.

Ever since she first learned about Delta, Wright wanted to participate. "It was kind of like this carrot dangling out there," she says. "Someday I'll get to do this stuff I really want to do." As a Delta intern, Wright developed a year-long curriculum for an elementary school class on Madison's east side where many students were English language learners. The curriculum engaged students in studying life cycles of local species by visiting a woodsy area near their school.

"A lot of it was 'What is science? What do scientists do?'" Wright says. She recalls that the students liked being in nature, and that their scientific skills improved as a result of the curriculum. Concluding her internship she developed a guide to teaching phenology in the elementary classroom.

While working with the elementary school students, Wright joined the first session of the CIRTL Diversity Resources Workshop - an outreach program designed to support STEM instructors in using the materials developed by the Diversity Team. The workshop motivated Wright to deliver three interactive diversity presentations. "The more you talk about [diversity] with other people, the more comfortable it becomes," Wright says.

More about the CIRTL Learning-through-Diversity program: [http://www.cirtl.net/pillars\\_LtD.html](http://www.cirtl.net/pillars_LtD.html)

More about CIRTL in general: <http://www.cirtl.net/>



**Catherine Friedrich**



## PART III

# Use of Dollars after a School Finance Reform

This is the third of a four-part series covering highlights from CPRE research. As part of its work over the past 15 years, the Consortium for Policy Research in Education (CPRE) has analyzed how funds have been used at the local level after a school finance reform. In the early 1990s, for example, it analyzed these issues in Kentucky, New Jersey, and Texas, after each state enacted large school finance reforms. (Kentucky's changes, by the way, initiated the school finance adequacy movement.)

All the studies encountered the problem that not much data were available at the school level, where teaching and learning take place. UW–Madison education professor Allan Odden directs CPRE research at WCER. He says the usual spending category labeled “instruction” is too broad to provide any detail of resource use by educational program or strategy. That led Odden and colleagues to develop an expenditure reporting framework to study the use of school finance reform dollars with reforms in Arkansas and Wyoming.

Standard fiscal reporting systems don't provide the detailed information on resource use practices that state policymakers want to see, Odden says. To get to that level of detail, CPRE researchers interviewed educators and analyzed documents on site in each school. Odden and colleague Larry Picus continue to work with states to redesign their fiscal reporting systems so that these kinds of data can be produced through standard financial reporting structures.

Odden and Picus recommend that states restrict the use of school finance adequacy dollars. For example, if policymakers concludes that specific uses (such as class sizes of 15 in grades K–3) will improve student achievement, then it would make sense to put dollars for these purposes into a focused categorical program to ensure that such resources are used as intended. Otherwise, they may be used for other purposes.

### Salary Recommendations

Educational strategies and the number of teacher positions need to be adequate, but that's not enough, Odden says. Teachers need to earn an ‘adequate’ salary.\* Their salaries should be comparable to salaries of occupations that require similar competencies, skills, and job responsibilities. But it's difficult to make such comparisons, Odden says, because data currently available usually do not include benefits. An ideal analysis would include benefits because they tend to be higher for teachers than those for comparable jobs in the private sector.

\* [As mentioned earlier in this series, the term ‘adequacy’ may seem to narrowly focus on the amount of money needed to produce a desired level of student achievement. But the more general intent underlying the focus on adequacy is to redesign the education finance system to link resource levels, and to link resource use more directly to strategies that improve student achievement.]

A book about teacher compensation recently published by CPRE<sup>1</sup> makes the case for several additional teacher salary premiums that are appropriate in some circumstances: in subject area shortages such as mathematics and science; in geographically challenged communities such as isolated rural and inner-city urban locations; and in low-performing and or high-poverty schools.

These premiums would violate the ‘equity’ embedded in the current single-salary schedule. However, when premiums are not provided, districts experience shortages of teachers, or they can hire only lower quality teachers. Offering a salary premium in these instances is one part of the solution.

Along with other sources, CPRE research suggests that teacher compensation structures move away from basing annual salary increases on teachers’ years of experience and education degrees. These measures do not strongly link to student learning gains. Instead, compensation should reflect teachers’ instructional expertise that leads to student learning gains.

In many districts CPRE studied, human resource management systems did not align with newly desired teacher competencies. Human resource policies were embodied neither in new teacher assessment systems nor in the compensation structures. In response, CPRE staff developed a tool enabling districts to conduct ‘strategic human resource system audits.’ CPRE researchers use this instrument to conduct HR audits in districts and then use the results to help districts redesign their overall HR systems.

### School-Based Budgeting

Sometimes referred to as the “weighted student formula,” school-based budgeting involves

decentralizing the budget authority to schools. The “weighted student formula” allots funds to schools based on the number of students who attend. Odden recommends that districts consider creating a needs-based weighted pupil formula, considered a more objective way to distribute resources. To make school-based management work, and to boost student learning, schools need the authority to build their own budgets that allocate resources in different ways. This approach is becoming more widely used around the world, Odden says. Increasing school-level control over budgeting, hiring, and curriculum enables schools to target resources to appropriate programs and services.

<sup>1</sup>How to Create World Class Teacher Compensation; [www.wcer.wisc.edu/cpre/publications](http://www.wcer.wisc.edu/cpre/publications)

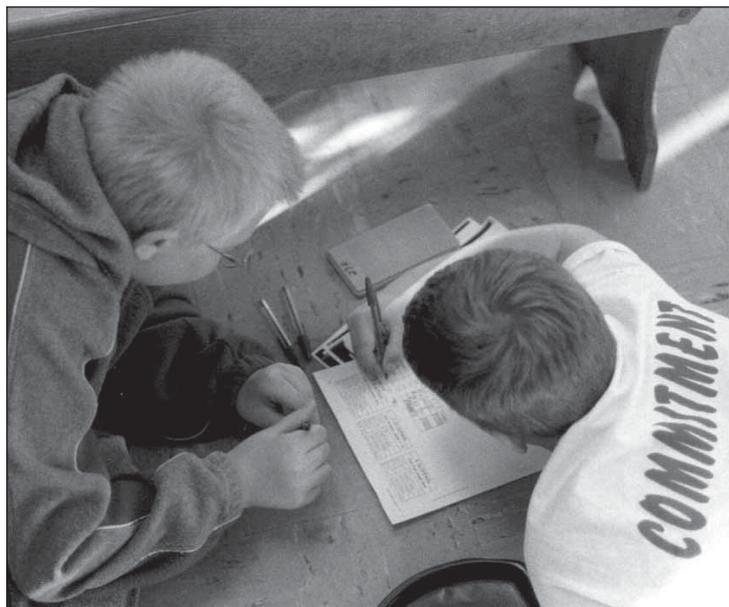
### END PART III

The fourth and final installment in this series will include a synthesis of findings with implications for policy and practice.

The complete CPRE report is available online <http://www.wcer.wisc.edu/cpre/index.php>.



Allan Odden



Director Adam Gamoran  
 Editor Paul Baker  
 Editorial Consultants Rebecca Holmes & Cathy Loeb  
 Production Instructional Media Development Center

*WCER Research 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.

No copyright is claimed on the contents of *WCER Research Highlights*. In reproducing articles, please use following credit: "Reprinted with permission from *WCER Research Highlights*, published by the Wisconsin Center for Education Research, UW–Madison School of Education." If you reprint, please send a copy to *Research Highlights*.

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

ISSN 1073-1822  
 Vol. 19, No. 3  
 SPRING 2008

This Newsletter is archived in PDF form on WCER's website:

[www.wcer.wisc.edu/publications](http://www.wcer.wisc.edu/publications)

*WCER Today* is a monthly email newsletter reaching more than 1900 readers at more than 700 organizations. A sample issue and subscription information are available here, <http://www.wcer.wisc.edu/publications/index.php>, where you can also subscribe to this content as a Podcast.

Nonprofit  
 Organization  
 U.S. POSTAGE  
 PAID  
 Madison, Wisconsin  
 Permit No. 658