Aligning Educational Policy and Curricula with Employer Expectations

 Millions remain unemployed as the nation’s economy recovers all too slowly from the recession of 2008.

A common explanation for this state of affairs in the media and policymaking circles focuses on the “skills gap,” which is a structural mismatch between the supply of workers with particular skill sets and employers’ demands for qualified workers. Instead of studying whether or not a skills gap exists, WCER scientist Matthew Hora is focused on a more fundamental problem: describing the nature of employer expectations and whether or not they are aligned with the postsecondary curriculum in 2- and 4-year colleges and universities. Insights into this dynamic can point the way towards more effective educational policy and curricula that can adequately prepare students for success in the 21st century economy.

In studying this issue Hora has found that employers want workers with more than just technical expertise, even though that assumption underlies many policy solutions for workforce development. Hora cites a 2011 national survey of manufacturing executives who said many workers lack “soft” skills (interpersonal and communicative abilities), as well as “hard skills” (technical and task-based proficiencies). The executives cited the largest skill deficiencies as problem solving (52% of respondents), basic technical training (43%), and basic employability skills such as work ethic (40%) and technology proficiency (36%).

In an analysis of a survey of 181 Wisconsin manufacturers, Hora found that technical skills were desired (25% of respondents), but this was followed closely by a need for mathematical skills (23%) and social skills (19%). And 51% of respondents cited the importance of a more fundamental personal attribute closely tied to a worker’s cultural background: a strong work ethic.

In a 2013 national survey of employers, 55% of respondents said it was important for employees to have both field-specific skills and a broad range of transferable competencies.
FROM THE DIRECTOR

Robert Mathieu

I have had the great pleasure of being in this position for six months now. During this time one of my primary goals has been to speak individually with as many people in WCER as possible. I don’t think there has been another time in my life when I have learned more, with the possible exception of my first semester in college!

I don’t need to tell you that education research is intellectually fascinating. At the same time, I have been struck by the passion with which the people of WCER seek to have their life work make a difference for learners. And I should say that both the School of Education and WCER are investing in major new ways to make that impact happen—more on that in my next message.

Change models almost always speak of the importance of the mutual engagement of all involved to achieve that change, for example through partnerships, learning communities, and, in the case of research-based change, action research collaborations. You will see several examples in this issue.

For example, department chairs in high schools often serve largely to coordinate schedules and manage budgets. A current implementation for impact describes how graduate student Jason Salisbury and Professor Carolyn Kelley collaborated with principals in urban high schools to transform their school department chairs into real leaders for learning. Here you can read about one of their success stories.

Epistemic Frame Theory, developed by David Williamson Shaffer and colleagues, is being used to explore the quality of teachers’ thinking. A recent study employed this theory to distinguish among levels in teacher knowledge by mapping its coherence. These findings, in turn, will help researchers work with teachers to support their ongoing development.

Matthew Hora addresses the mismatch between employer expectations and the supply of workers. Rather than blaming a so-called “skills gap,” Hora describes the nature of employer expectations and whether or not they align with the postsecondary curriculum in 2- and 4-year colleges and universities. Better understanding this relationship should enable more effective educational policy-making and curricula.

Finally, you will gain food for thought as you consider the Common Core Standards. Catherine Compton-Lilly argues that, although well-intentioned, the Common Core Standards fail to address a number of important things: the racism and poverty that interfere with student achievement, the persistent achievement gap, and the unique experiences each student brings to the classroom.

Robert Mathieu
WCER Director
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In the survey, conducted by the American Association of Colleges and Universities, 93% of respondents agreed that “a candidate’s demonstrated capacity to think critically, communicate clearly, and solve complex problems” is more important than a particular field of study.

Based on an analysis of the literature and preliminary findings from a National Science Foundation study on these issues, Hora offers these recommendations to educators and policymakers.

1. Develop a comprehensive view of skills that extends beyond the technical and task specific. Employers seek workers who collaborate, communicate, reason abstractly, and demonstrate a strong work ethic. Thus, what employers seek is a cluster of skills, proficiencies, and aptitudes whose complexity is obscured by the singular focus on technical expertise

2. Support workforce development initiatives that reflect these needs. Policymakers should support programs that target student proficiencies in both soft and hard skills. A certificate program in welding, for example, could require students to work in teams, solve authentic problems in the real world, and communicate with customers and co-workers.

3. Encourage interactive classroom instruction and apprenticeships that cultivate a diverse range of skills. Interactive approaches to teaching, such as peer instruction and problem-based learning, shape many educational reform initiatives. Interactive approaches cultivate skills in critical thinking, problem solving, and communicating. Policymakers should allocate resources to support teacher professional development in interactive teaching methods at 2-year and 4-year colleges and universities.

4. Address the widespread perception that many job applicants and employees lack a strong work ethic. One way to cultivate a strong work ethic in students is by strictly enforcing classroom rules, basing assessments on group work that fosters a sense of responsibility to one’s peers, and holding high standards for the quality of all student work.

5. Expand views of the purpose of higher education to include both vocational preparation and fundamental intellectual development. If students are trained with both goals in mind they will likely be competitive in the job market because they will have acquired technical expertise as well as transferable abilities that are in high demand in the labor

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Department Chairs Become Instructional Leaders

Distributed throughout a high school, department chairs are ideally positioned to help increase student learning, and yet they receive little or no formal training, and there is no universally accepted job description. Due to the ambiguities and multifaceted responsibilities of the role, the department chair is considered one of the most stressful positions in a high school.

The principal of a high school is in a position to help department chairs exert a positive influence on instruction and student learning, and yet this rarely occurs. As a consequence, the role of department chair has been called "the most underutilized leadership position" in high schools today (L. David Weller, University of Georgia).

UW–Madison education professor Carolyn Kelley and graduate student Jason Salisbury examined the opportunities for improving the success of department chairs in advancing learning. They worked with six large, urban, comprehensive high schools in two urban school districts.

Pennant Hills High School (a pseudonym) was one of the schools where they worked to strengthen leadership development, raise student learning outcomes, and reduce the achievement gap.

Across the country, many department chairs report that their responsibilities primarily involve managerial and bureaucratic tasks. This has only increased as policies and regulations demand more and more from schools, even as resources decline. At Pennant Hills, department chairs traditionally had served largely as schedulers and budget managers. Busy with administrative tasks, the chairs had not considered themselves instructional leaders, nor did their peers view them that way.

Working with Kelley and Salisbury, the Pennant Hills principal redefined the role of the chairs as instructional leaders, helping to create a shared vision and building trust within the school’s leadership team to enable chairs to carry out that role. The principal also provided the chairs with professional development opportunities to support their development as instructional leaders.

Initially, however, Pennant’s department chairs felt uncomfortable with their redefined role. They were concerned that their peers would not accept them as legitimate leaders, and they believed that they lacked the time and skills to carry out the new role.

But soon the chairs grew into the role of instructional leader. Some said the change was motivating and energizing. They gained confidence and felt committed to the importance of their new role. By year’s end the chairs had embraced the role of instructional leader. There was a greater trust and sense of community among the chairs, a willingness to turn to one another to solve problems, and a commitment to practicing effective leadership behaviors.

The principal at Pennant Hills was able to redefine the role of department chairs as instructional leaders through an explicit and purposeful process. The chairs were given time to shape and understand their new role and to form a community of support. The chairs demonstrated more awareness of their school’s achievement gaps and the structures, instructional practices, and beliefs that contributed to them. Over time, the department chairs became more engaged, empowered, and responsible for advancing instructional effectiveness in their schools.

For the complete report and additional case studies see “Defining and Activating the Role of Department Chair as Instructional Leader,” Journal of School Leadership, Vol. 23, March 2013.

Carolyn Kelley
Measuring Coherence in Teacher Knowledge

To measure the coherence of teacher knowledge, researchers asked math teachers to react to a mathematical task. As teachers addressed the problem, patterns of connections among concepts became apparent. To visualize these patterns, the research team created conceptual “network maps” for each teacher. These maps showed that stronger teachers invoked high numbers of concepts and demonstrated a clear pattern of connections among key concepts.

What does it mean for teachers to have coherent understanding of their subject?

Coherence is considered an important aspect of knowledge. Incoherent understanding of a subject comprises disconnected facts. By contrast, coherent knowledge allows one to bring to a subject richly connected ideas, to zoom to the heart of a complex subject, and to offer strategic solutions. Yet coherence has seldom been defined or measured, even in the context of teaching and learning.

UW–Madison education professor David Williamson Shaffer and colleagues Chandra Hawley Orrill and James Burke, both at the University of Massachusetts Dartmouth, found a way to illustrate what coherence might mean in a teacher’s content knowledge.

Orrill’s pilot study was based on the Epistemic Frame Theory, developed at UW–Madison, which holds that not only do experts possess more knowledge than novices, but also their knowledge is organized in fundamentally different ways. Complex thinking can be understood in terms of the connections among “frame elements.”

Shaffer says one can think of expertise as a network of connections among specific understandings, articulated through discourse. For example, when asked to discuss a video of a complex teaching situation, expert teachers are better able to attend to important instructional aspects of the class, while novices are overwhelmed with details.

The research team used Epistemic Network Analysis (ENA) to uncover the connections teachers made among concepts. Assessing the development of expertise is a significant challenge, but ENA provides a way to quantify the relationships among ideas and thus to assess them. ENA focuses on the patterns of relations among discourse elements rather than individual ideas within that discourse. By treating epistemic frames as cognitive networks, different frame elements become “nodes” and the patterns of connections constitute the “links” among these nodes.

By quantifying these patterns of connections, ENA provides a way to measure complex thinking and problem solving. It’s a promising approach for exploring the question of what it means for a teacher to have more coherent understanding of his or her subject.

The Salad Dressing Recipe

The researchers interviewed seven middle school mathematics teachers from both urban and rural school districts, whose experience ranged from one year to more than 10 years. Based on analysis of their relative demonstrated knowledge in clinical interview, researchers ranked the teachers as stronger, middle, and weaker. Researchers presented the teachers a mathematics task developed by Joanne Lobato that explored the relationship between fractions and ratios. The teachers applied different
sets of skills, knowledge, and values to address the problem (see the salad dressing recipe in Figure 1).

The question was one of a series of prompts considering the relationship of oil to vinegar in a salad dressing recipe. Videotaped interviews were conducted with middle grades teachers and transcribed verbatim.

After analyzing data from responses, the researchers created network maps for each teacher that reveal the ability to make connections among concepts. The maps differentiate the strong, middle, and weak teachers.

For strong teachers, thicker lines show node interactions occurring more than once (see Figure 2). They indicate areas of high coherence, defined as multiple connections. Teachers Greg and Lynda both had strong connections among discussing the fraction-ratio connection, discussing fraction operations, and interpreting the salad recipe problem. This suggests that they used general problem-solving skills. The second common area of high numbers of connections was the relationship between “attending to context” and “ratio-as-measure.”

Like the strong teachers Greg and Linda, the middle teachers showed some patterns of connectedness among ideas, but they did not have as much balance between fraction and ratio ideas.

The weak teachers did not show a consistent pattern in terms of the number of connections. They made connections inconsistently. For example, Kate included a wide variety of concepts in her responses, but everything was connected evenly. Carrie introduced fewer concepts into her response to the task and there was no clear pattern of connectedness among her ideas (see Figure 3).

Put another way, the strong teachers drew upon more concepts and made more connections among them. The middle teachers drew on fewer resources, yet they showed some connections among their ideas, suggesting coherence within those concepts. The weak teachers seemed to draw upon their resources without clear connections among the concepts they were studying.

This research moves beyond measuring the quantity of teacher knowledge to understanding how teachers use their knowledge. By developing better understandings of knowledge coherence, researchers will be better able to support teacher development.

During professional development, one teacher shared with a colleague:

“I’m still confused about something. In the Mr. Miller problem, if I think about $\frac{2}{5}$ and $\frac{6}{15}$ as equivalent fractions, then the amounts represented by both are the same and $\frac{2}{3} = 1$.

But if I think about 2:5 as a ratio and triple the batch of salad dressing, I get a lot more salad dressing, and I think I’m multiplying by 3 not $\frac{2}{3}$.

What would you say to this teacher?

David Williamson Shaffer
A professor considers the Common Core Standards in the context of students she has taught and the historical inequities that have plagued American schools. She asks: How can a “common” and assumedly “core” set of standards address social inequity and ensure that all children become highly literate?

Many students live in poverty. Yet, even if their achievement lags behind that of their classmates, they bring to their schools rich, diverse experiences. Can a set of common standards address racism and poverty that interfere with student achievement?

Can common standards address and reduce the achievement gap?

Will common standards tap into, and build on, the unique experiences students bring to the classroom?

UW–Madison education professor Catherine Compton-Lilly says, “No.”

In fact, she says, the crisis facing American schools is not a lack of common standards. The real crisis is racism and poverty. Mainstream news accounts of “failed schools” blame teachers and cite declining standards. But the fault lies in schools’ inability to equitably recognize, value, and build on these different ways as educators plan and implement instruction and assess student progress.

For example, Compton-Lilly points to the “K-5 Reading, College and Career Readiness Anchor Standards for Reading” (Common Core Standards, 2010). These Standards present four reading areas: key ideas and details, craft and structure, integration of knowledge and ideas, and range of reading and text complexity.

The section dedicated to “key ideas and details” highlights the activities recounting, retelling, and summarizing. Compton-Lilly says these are fairly low-level skills. They entail remembering information from the text and reproducing it for an audience. These tasks require neither analysis nor evaluation. Instead they ask for a literal interpretation of what the student read. They require the reader to focus on the text as a stand-alone entity, unconnected to his or her experiences beyond the text.

The Common Core-aligned rubric “craft and structure” focuses on the interior structures of texts and how they are presented. It ignores what students bring to the text. Different cultural groups have different ways of structuring
and telling stories that are worthy of consideration. By limiting analysis to what is presented in texts, the Standards silence insights from a diversity of children’s knowledge.

Guidelines under the heading “integration of knowledge and ideas” invite students to “compare and contrast stories,” “draw on multiple print or digital sources,” and “integrate information from several texts.” Students must use teacher-provided texts to construct meaning, rather than drawing on their own experiences and cultural knowledge. Therefore, meaning is situated within texts, rather than within students and communities.

Compton-Lilly asks: What can this mean to a Puerto Rican child who reads an account of the voyage of Columbus that does not acknowledge the impact his visit had on the Táino people? What can this mean to an African-American student who encounters a textbook reference to Malcolm X that omits his role as a human rights activist?

Textual meaning does not reside solely in texts, Compton-Lilly says. Meaning is a human construction that involves multiple ways of being, knowing, and thinking, and human experiences beyond particular texts.

An achievement gap separates White middle-class students from students who bring diverse cultures and social class experiences to classrooms. Compton-Lilly says that gap will not be reduced by a “common” and “core” set of standards, curriculum, or assessments.

By privileging one way of being literate and one way of making sense of texts, she says, the Standards fail to recognize and value those students who embody various “funds of knowledge” reflecting diverse families and neighborhoods. Educators must consciously and consistently work to identify and incorporate this knowledge into the classroom rather than forcing on children a restrictive way of knowing.

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market. Thus, fostering students’ overall intellectual development is consistent with employer expectations and bolsters the argument that the purpose of higher education should go beyond simply preparing students to get a job.

With support from the National Science Foundation, the Center on Education and Work at UW–Madison is conducting a study exploring the issues highlighted in this discussion. The 3-year study will include interviews with 90 employers and educators in Wisconsin to further clarify the alignment (or lack thereof) between employer expectations for worker skills and the postsecondary curricula in manufacturing and biotechnology.

One aim of the study is to provide recommendations about how to integrate this information into educational programs and coursework. For more information see http://skillsgapstudy.wceruw.org

Matthew Hora

New Network to Mobilize Research Knowledge

After more than three years of planning and design, the new Wisconsin Collaborative Education Research Network (the Network) has opened its doors. The Network aims to enrich the work of researchers, education outreach organizations, and education leaders in our community and across the state, ultimately improving coordination of resources when responding to the complex needs and challenges facing public education.

Jack Jorgensen and Rich Halverson, co-directors of the Network, note that sometimes researchers need help to locate and recruit schools to participate in research projects. Moreover, practitioners can serve as a rich source of information to inform future research questions and grant proposals, and often want more access to research that could guide and inform their improvement efforts. Network staff and leaders are putting into place physical and virtual opportunities for researchers, educators, administrators, and community members to find innovative ways to boost productivity and transform education. Future stories will provide updates on the Network’s activities and achievements.