
COMPETENCY-BASED EDUCATION

An Overview for Michigan's Superintendents

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Executive Summary

Across the U.S., competency-based education has begun to gain attention. Educators, policy makers, and education advocates are increasingly looking to implement this system, seeing it as a path to improve the quality of K-12 education, while guaranteeing that every student graduates high school prepared for college and adult life.

The basic premise of competency-based education is simple: Students advance through their coursework only after demonstrating academic mastery. Not only must students master Algebra I before progressing to Geometry, for example, but they must also master less-complex topics *within* Algebra I before moving to more advanced topics. The ramifications of this premise are large. By focusing on mastery, competency education allows students to move at a self-directed pace, advancing only when they are ready to do so. This upends the traditional organizing units of education: age-based cohorts and prescribed instructional hours for each course.

Competency-based education, then, represents a large systemic shift for K-12 education. Advocates for this shift say that current K-12 schools fail to prepare all students for the 21st century's economy. Research on students' learning, they say, suggests that a one-size-fits-all approach to education doesn't work, an idea supported by troubling statistics about high school dropouts and achievement gaps between students.

Competency-education advocates call for a completely revamped system. In an educational system framed by competency, students not only move at their own pace, but they also have multiple opportunities to demonstrate mastery. These include the use of online courses and the participation in out-of-school learning opportunities, such as internships. Learning takes place "anywhere, anytime," and with regular formative assessments, teachers respond rapidly to students' needs. Report cards list students' mastery of competencies and standards, rather than listing a single letter grade. And students can move from one course to another, irrespective of the academic calendar.

Competency-based education represents a structural change for schools. As such, it has been implemented to varying degrees across the U.S. That is true even in New Hampshire, which mandates that every public school rely on competency education. To see what competency education looks like on the ground, this report surveys several schools, focusing on their implementation of core competency features.

In order to implement competency-based education, educators need to develop a wide variety of new educational materials. This work includes the writing of course-by-course competencies, performance standards, assessments, and rubrics. These are the key components of competency-based assessment. Producing these materials, however, is a large undertaking, requiring many years' work and potentially thousands of hours of staff time.

The basic premise of competency-based education is simple: Students advance through their coursework only after demonstrating academic mastery.

In addition to producing these materials, schools must decide how to track new types of student data. Competency education reports on competency- by-competency proficiency, not a single letter grade. Because of this, schools must either redesign their student information systems or rely on a limited pool of off-the-shelf options.

Competency advocates argue that a revamped education system will better serve low-performing students. Schools often practice social promotion, advocates note, which can leave students unprepared for more advanced coursework. Knowledge gaps can accumulate over years, they add. Grade retention can be equally problematic. Competency-based education promises to find a middle ground between retention and promotion, advancing students only when they master materials. Theoretically, this should benefit struggling students. Yet early adopters of competency-based education say that, when self paced, struggling students perform even worse, given their challenges with motivation. This is one of the major challenges facing the proposed reform.

Addressing these and other issues at a community level is crucial. With systemic changes so wide reaching, community engagement is necessary to support the long-term work required of reform. This work often takes place in community groups, public forums, parent groups, and groups made up of school staff.

Competency-based education also requires changes to public policy. In Michigan, schools already have at their disposal many core elements of competency-based education. Yet state policy makers will still have to consider potentially sweeping changes, covering instruction-time requirements for funding, among other issues. Federal education policy includes several complications for competency-based education, too.

Related to discussions about policy are discussions about costs. Competency-based education requires significant investments in staff time, community outreach, and direct expenditures. Policy makers will need to decide whether Michigan's schools have the capacity to address those costs.

Policy makers must also confront a limited base of evidence to support competency-based education. Individual components of reform, such as personalized learning, are supported by independent research. Yet there is currently no academic research demonstrating the effectiveness of K-12 competency-based education. Competency advocates argue for their proposal on the grounds that current education systems are broken, yet it is worth noting the significant, steady gains in academic attainment and achievement over the last four decades. These data potentially complicate the arguments that support competency-based education.

What is Competency-Based Education?

An exact definition of competency-based education (CBE) can be challenging to find. Among schools, government agencies, and advocates, the term carries different meanings.^{1,2} As a practice, CBE varies widely from state to state, school to school, and even between K-12 education and post-secondary education.

Still, a few features appear consistently in most competency systems of education. Members of the U.S. House of Representatives, in a 2013 bill to establish a post-secondary CBE pilot program, summed up these key characteristics, defining CBE as:

An educational process that—(A) is characterized by the measurement of learning as opposed to the measurement of instructional and learning time; (B) uses direct assessment of student learning, or recognizes the direct assessment by others of student learning, in place of or in addition to using credit hours or clock hours; and (C) includes direct measures of learning, including projects, papers, examinations, presentations, performances, and portfolios.

This definition captures much of what currently drives CBE advocacy. Competency education, in this framework, requires students to master material before advancing, a change from a system in which advancement is dictated in part by the time spent in class. Students must demonstrate this mastery. And this demonstration can take a number of formats.

CompetencyWorks, a group that advocates the expansion of CBE, also defines CBE as a system in which students advance after demonstrating mastery. Yet they include four additional tenets:

1. Competencies include explicit, measurable, transferable learning objectives.
2. Assessment is meaningful and a positive learning experience for students.
3. Students receive timely, differentiated support based upon their individual learning needs.
4. Learning outcomes emphasize competencies that include application and creation of knowledge, along with the development of important skills and dispositions.³

¹ Le, Cecilia, Rebecca Wolfe, and Adria Steinberg. "The Past and The Promise: Today's Competency Education Movement." *Jobs for the Future*, September 2014.

<http://www.jff.org/sites/default/files/publications/materials/The-Past-The-Promise-091514.pdf>

² Kelchen, Robert. "The Landscape of Competency-Based Education: Enrollments, Demographics and Affordability." *American Enterprise Institute*, January 2015.

<https://www.aei.org/wp-content/uploads/2015/01/Competency-based-education-landscape.pdf>

³ "Understanding Competency Education in K-12." *CompetencyWorks*, n.d. <http://www.competencyworks.org/wp-content/uploads/2014/11/CWorks-Understanding-Competency-Education.pdf>.

Competency education, in this framework, requires students to master material before advancing, a change from a system in which advancement is dictated in part by the time spent in class. Students must demonstrate this mastery. And this demonstration can take a number of formats.

CompetencyWorks' definition is influential among policy makers and other advocates. Groups such as the Christensen Institute for Disruptive Innovation cite this definition when describing CBE, and the Iowa Department of Education mirrors the definition in its own guidelines for PK-12 competency-based pathways.⁴

COMPETENCY EDUCATION IN K-12 VS. HIGHER EDUCATION

Higher education has been a testing ground for CBE, as high-profile universities, like the University of Wisconsin, have begun to offer competency-based diplomas. Yet in higher education, there is also little consensus about CBE's definition.⁵ According to the American Enterprise Institute, higher-education CBE is broadly defined as a system in which credit is granted on the basis of student learning, not credit or clock hours. The group describes two forms of CBE in higher education: the granting of credit through prior-learning assessments, such as advanced placement tests; and newer competency-based courses, where students move toward a degree by proving they have mastered content.

Under the latter form, K-12 and higher-education CBE are relatively similar in theory. Both emphasize mastery over the time spent in class. And both allow for a more personalized education, in which students move at their own pace.⁶

⁴ "Iowa Department of Education Guidelines for PK-12 Competency-Based Pathways." Iowa Department of Education, August 2013. <https://www.educateiowa.gov/sites/files/ed/documents/Competency-basedGuidelines2013-11-13.pdf>.

⁵ Kelchen, "The Landscape of Competency-Based Education."

⁶ "Prior Learning and Competency-Based Education." New America Foundation, n.d. <https://www.newamerica.org/postsecondary-national-policy-institute/prior-learning-and-competency-based-education/>.

WHAT IS A COMPETENCY?

Defining *competency* may be just as important as defining *competency-based education*. A competency, by many accounts, includes both the skills and knowledge required to master a standard. Significant, too, is that competency includes the ability to apply skills and knowledge beyond the immediate classroom setting.

The Iowa Department of Education offers the following definition, which captures the consensus: a competency is “an enduring understanding that requires the transfer of knowledge, skills, and dispositions to complex situations in and/or across content areas and/or beyond the classroom.”⁷

WHAT CBE IS NOT

Competency-based education goes by a few names. *Proficiency-based education* and *competency-based education*, for example, are often used synonymously. Functionally there is little difference among the terms.

Yet these terms should not be confused with other, related terms, such as *standards-based education*. Standards are core to CBE systems, since they describe what students should know and be able to do.⁸ However, standards-based education does not necessarily decouple seat time and student advancement.⁹ Nor does it necessarily call for teachers to assess students' mastery in multiple ways.

One other term should be mentioned: *personalized learning*. While personalized learning is a core feature of CBE, the two are not interchangeable terms. A school might choose to offer a personalized education for students; students might have access to online classes, or they might have a greater degree of control over curricula. Yet, again, this does not necessarily mean progress will be based solely on mastery, rather than the time spent in a course.

⁷ Iowa DOE, “Iowa Department of Education Guidelines.”

⁸ Maine Department of Education. “Standards.” Accessed online February 5, 2015. <http://www.maine.gov/doe/proficiency/standards/index.html>.

⁹ Le, C., et al., “The Past and The Promise.”

TRADITIONAL EDUCATION COMPARED WITH DEFINING ELEMENTS OF CBE

TOPIC	TRADITIONAL EDUCATION	COMPETENCY-BASED EDUCATION
How credit is earned	Students gain academic credit based on the Carnegie Unit, 120 hours spent in class, and by earning a letter grade above an F.	Students gain academic credit by demonstrating mastery of individual competencies.
Assessments	Traditional assessments of mastery include in-class tests, homework, and projects. Assessments may only measure what students “know.”	Competencies may be assessed in numerous ways, including through out-of-school projects or performance pieces. The goal is to measure both what students know and can do.
Grade levels	Students advance in grade levels with students of the same age.	Students advance only after mastering standards and competencies.
Pacing	Pacing is dictated by the teacher and the academic calendar.	Students are self-paced, and proceed toward assessments when they are ready.
Reporting systems	Report cards list A-F grades.	Reports list detailed descriptions of students’ competencies, with language such as “highly competent,” “competent,” or “not yet competent.”
Credit for non-academics	Culminating grades may include non-academic factors, including effort, organization, and attitude.	Competencies distinguish between those that are academic and those that are not.
Where and when instruction takes place	Instruction takes place in a classroom, in a brick-and-mortar school, during the traditional academic school year.	Instruction can take place “anywhere, anytime,” including in off-campus internships and online courses.

Why Competency Education is Being Talked About Now

In many ways, national interest in competency-based education stems from *A Nation at Risk*.¹⁰ That report, released in 1983 by the National Commission on Excellence in Education, harshly criticized the nation's system of education. The report's authors found that curricula was weak in secondary schools; that American students spent relatively little time studying math and science, compared to students in other industrialized countries; and that states had set low educational standards for students.¹¹ This list represents only a fraction of the report's dire findings.

The report recommended, among other things, that K-12 schools, colleges, and universities adopt more rigorous standards for academics and student conduct. This recommendation wasn't taken lightly.

This vision, which helped propel the standards-based education movement, was a pillar of 1994's reauthorized Elementary and Secondary Education Act.¹² This federal law required states to set rigorous content standards for students. Under the law, states also developed assessments aligned with the standards. This system was intended to boost academic rigor, while providing a system of accountability for the public.

The 2001 reauthorization of the ESEA, the No Child Left Behind Act, intensified these requirements by setting higher stakes for failure.¹³ It also set higher ambitions, intending to close gaps in academic achievement between minority and nonminority students, while raising academic performance for all students.¹⁴

¹⁰ Ibid.

¹¹ National Commission on Excellence in Education. "Findings." Accessed February 13, 2015. <http://www2.ed.gov/pubs/NatAtRisk/findings.html>.

¹² Shepard, Lorrie (Ed.), et al. "Standards, Assessments, and Accountability." National Academy of Education, 2009. http://www.naeducation.org/cs/groups/naedsite/documents/webpage/naed_080866.pdf.

¹³ Ibid.

¹⁴ Jimerson, Shane R., Sarah M. W. Pletcher, Kelly Graydon, Britton L. Schnurr, Amanda B. Nickerson, and Deborah K. Kundert. "Beyond Grade Retention And Social Promotion: Promoting The Social And Academic Competence Of Students." *Psychology in the Schools*: 85-97.

Yet, according to some reformers, the U.S. is still a nation at risk. Despite previous reforms, our education system is still deeply flawed, they argue. They claim it is not preparing students to compete in a global, knowledge-driven economy. According to the Nellie Mae Education Foundation, "While just going through the motions of school, getting by with 'C' and 'D' grades, was never optimum, it is now more than ever a dead-end for students and society as a whole."¹⁵ The current system, the group adds, has done little to shrink the gap in achievement between students of different races and socioeconomic classes.

Yet, according to some reformers, the U.S. is still a nation at risk. They claim it is not preparing students to compete in a global, knowledge-driven economy.

Anxieties about the U.S.'s education system have bipartisan support. In a joint report, the Center for American Progress, a liberal think tank, the American Enterprise Institute, a conservative think tank, and the U.S. Chamber of Commerce warn that students are leaving high school unprepared for the 21st-century economy.¹⁶ The groups advocate large-scale systemic reforms, which they say are necessary to solve "seemingly intractable problems like the high school dropout crisis."

The validity of these claims is up for debate, and will be discussed later in this report, alongside research limitations of CBE. Still, the urgent tone that surrounds these messages, along with their broad political support, has laid the groundwork for systemic reforms, including the shift to a CBE-focused system.

OTHER TRENDS THAT SUPPORT COMPETENCY EDUCATION

Several other factors have helped spark interest in CBE.

Personalized learning

Academic standards have been adopted widely throughout the U.S. Educators and policy makers say standards set deep, rigorous requirements for the knowledge and skills students must acquire in school. Yet standards do not assert how students will acquire the knowledge and skills.

Increasingly, educators have grown interested in personalized learning.¹⁷ Personalized learning in part calls for individualized instruction, with teachers tending to the specific needs and strengths of each student.¹⁸ With personalized learning, academics may take place in non-traditional settings, including online. Personalized learning, as a theory, stipulates that students should have greater control over their education, whether that control is over delivery methods, assessment methods, or pacing.

¹⁵ Priest, Nora, Antonia Rudenstine, and Ephraim Weisstein. "Making Mastery Work." Nellie Mae Education Foundation, November 2012. <http://www.competencyworks.org/wp-content/uploads/2012/11/Making-Mastery-Work-NMEF-2012-Inline.pdf>.

¹⁶ "A Joint Platform for Education Reform." The U.S. Chamber of Commerce and The Center for American Progress, February 2007. <http://web.archive.org/web/20081104082039/http://www.uschamber.com/NR/rdonlyres/eguedi4uggpi5lshzvgvskrgiqw6xeaiij5f5mtimjwy2xmnknavl5mngsviu4uhgo3xjb7nmluvqqz54bit7yg5ve/070227jointplatform.pdf>.

¹⁷ Le, C., et al., "The Past and The Promise."

¹⁸ "MDE - Personalized Learning Options." MDE - Personalized Learning Options. Accessed February 4, 2015. http://michigan.gov/mde/0,4615,7-140-28753_65799--,00.html.

Still, personalized learning can account for the social nature of education. According to the U.S. Department of Education, “teaching is fundamentally a social and emotional enterprise.”¹⁹ In a report on personalized learning, the Center on Innovations in Learning also notes that students learn by observing other people’s behavior.²⁰

Some educators use digital learning technology, delivered individually for each student, as the sole means to personalize learning. Online learning does help to personalize instruction. In practice, though, personalized learning encompasses a wide range of approaches, including small-group instruction and diverse learning pathways, such as career-oriented internships.²¹

Technology

Closely related are the numerous improvements in educational technology. Technology has the capacity to make learning more personalized.²² Online curricula offer students the ability to move at their own pace, while potentially benefiting from individualized assessments.

Technology offers potential benefits for teachers, too. Content management systems and e-portfolio platforms allow teachers to manage large pools of student data. They also allow teachers to take a finer-grain look at student mastery.²³ According to the Carnegie Foundation for the Advancement of Teaching, “New information platforms permit educators to more precisely and quickly identify individual student strengths and weaknesses, modify instruction to students’ specific needs, and report with greater precision what students know, where they struggle, and how best to help them.”²⁴

Project-based learning

An extension of personalized learning is project-based learning. Research has shown that students thrive when they have opportunities to apply their learning in real-life scenarios.²⁵ Researchers also say that these out-of-the-class opportunities can be particularly beneficial for struggling students.²⁶

¹⁹ Atkins, Daniel, et al. “Transforming American Education: Learning Powered by Technology.” U.S. Department of Education, November 2010. <http://tech.ed.gov/wp-content/uploads/2013/10/netp2010.pdf>.

²⁰ Redding, Sam. “Personal Competencies in Personalized Learning.” Center on Innovations in Learning, 2014. http://www.centeril.org/publications/Personalized_Learning.pdf.

²¹ Abbot, Stephen (ed.). “Personalized Learning Definition.” *The Glossary of Education Reform*. Accessed April 10, 2015. <http://edglossary.org/personalized-learning/>.

²² Le, C., et al., “The Past and The Promise.”

²³ Glowa, Liz. “Re-Engineering Information Technology Design Considerations for Competency Education.” CompetencyWorks, February 2013. http://www.competencyworks.org/wp-content/uploads/2013/02/iNACOL_CW_IssueBrief_ReEngineeringCompEd_final.pdf.

²⁴ Silva, Elena, Taylor White, and Thomas Toch. “The Carnegie Unit: A Century-Old Standard in a Changing Education Landscape.” Carnegie Foundation for the Advancement of Teaching, January 2015. http://cdn.carnegiefoundation.org/wp-content/uploads/2015/01/Carnegie_Unit_Report.pdf.

²⁵ Lopez, M. Elena, and Caspe, Margaret. “Family Engagement in Anywhere, Anytime Learning.” Harvard Family Research Project, June 2014. http://www.hfrp.org/content/download/4573/121156/file/Family%20Engagement%20in%20Anywhere%20Anytime%20Learning_HarvardFamilyResProj.pdf.

²⁶ Freeley, Mary Ellen, and Richard Hanzelka. “Getting Away from Seat Time.” *Educational Leadership*, November 2009.

Frustrations with the Carnegie Unit

Some educational reformers take issue with the Carnegie Unit, saying it obscures the transparency of academic achievement and makes education inflexible. The Carnegie Unit—120 hours of contact time in a classroom—was initially developed, in the early 1900s, for the administration of university pensions. Since then, it has become a standard yardstick to measure academic progress, while shaping the instructional time students receive for a class. In most public high schools, students gain one academic credit per Carnegie Unit, though they must also receive a passing grade in the class. Students often must earn six or seven credits per year to graduate.²⁷

Yet, with the above-mentioned developments in technology, and with educators' increasing interests to personalize learning, some reformers see the Carnegie Unit as an obstacle, one that ties students to an arbitrary measure of progress. These reformers say that the Carnegie Unit rushes students who need more time, while delaying gifted students who master material more quickly.

Frustration with social promotion

Related to the frustrations with the Carnegie Unit, some education reformers take issue with social promotion. Social promotion involves the advancement of students to higher grade levels even when they have not mastered material, in order to preserve age-based cohorts.²⁸ Critics take numerous issues with social promotion. For one, they argue, the practice harms struggling students, giving them a false belief that they have mastered material. Critics also say the practice leaves students unprepared for higher levels of education.²⁹

Statistics on social promotion are notoriously difficult to obtain. Additionally, research is limited on the effectiveness of social promotion.³⁰

An opposing practice to social promotion, grade retention, has also come under attack. Estimates from the early 2000s showed roughly three million children retained each year in the U.S. This can come at a huge cost for states and school districts. In Florida, in the 2002-2003 school year, for example, about 192,000 students were retained in kindergarten through third grade, at a cost to the state of more than \$1 billion. Yet retention's costs aren't only financial. A large body of research has shown that retention can be harmful to students, both academically and emotionally.³¹

²⁷ Silva, Elena, et al. "The Carnegie Unit."

²⁸ Frey, N. "Retention, Social Promotion, And Academic Redshirting: What Do We Know And Need To Know?" *Remedial and Special Education*: 332-46.

²⁹ Abbot, Stephen (ed.). "Social Promotion Definition." *The Glossary of Education Reform*. Accessed February 24, 2015. <http://edglossary.org/social-promotion/>.

³⁰ Frey, N. "Retention, Social Promotion, And Academic Redshirting."

³¹ Jimerson, et al. "Beyond Grade Retention And Social Promotion."

Neither social promotion nor grade retention appears effective, then. But empirical research offers several alternatives to this paradigm. Alternatives include increased parent involvement and high-quality summer schooling. Researchers have also pointed to the potential benefit of multi-age and -abilities classrooms, which allow students to move at their own pace.³² Knowing this, CBE could serve as an alternative to the promotion-retention paradigm.

GROWING INTEREST IN MICHIGAN

The Carnegie Unit has been questioned in Michigan, too. In a 2011 message to the state legislature, Governor Rick Snyder said, “We must minimize all state and local barriers that hinder innovation at the local level, including seat time regulations, length of school year, length of school day and week, and the traditional configurations of classrooms and instruction.” Arguing for these changes, Governor Snyder cited large changes in the U.S. economy, and added, “A high-quality post-secondary education is needed for the technology age.”³³

A state government report supports Gov. Snyder’s second assertion. The report says that in Michigan in 2020, “Eight in ten new jobs will require STEM-related knowledge such as medicine, mathematics, and engineering.” The report does, however, note that between 2010 and 2020, “Occupations requiring a high school diploma or less will still generate 210,000 new positions, more than all other categories combined.”³⁴

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In his message to the legislature, Gov. Snyder noted several recent improvements in student achievement, including increases in Michigan Educational Assessment Program (MEAP) test scores and American College Testing (ACT) scores, as well as lower dropout rates. But Governor Snyder also cited what he said were troubling statistics, including that the majority of Michigan’s fourth and seventh graders were not measured to be proficient on MEAP writing exams. (Since then, scores have risen, with fourth and seventh graders both above 50 percent proficiency.)³⁵ These statistics supported the governor’s call for large changes in education policy, including the potential shift away from the Carnegie Unit.

³² Ibid.

³³ Snyder, Rick. “A Special Message from Governor Rick Snyder: Education Reform,” April 27, 2011. https://www.michigan.gov/documents/snyder/SpecialMessageonEducationReform_351586_7.pdf.

³⁴ Doyle, Kevin, Ryan Gimarc, Abbey Babb, and Myles Fowler-Quick. “Youth and Young Adults and the Michigan Labor Market.” State of Michigan Department of Technology, Management, and Budget, April 2014. http://milmi.org/admin/uploadedPublications/2157_Youth_and_Youth_Adults_and_the_Michigan_Labor_Market_Final.pdf.

³⁵ “Student Testing.” Accessed February 17, 2015. <https://www.mischooldata.org/DistrictSchoolProfiles/AssessmentResults/Meap/MeapPerformanceSummary.aspx>.

Theory Supporting Competency Education

Competency-based education has its historical roots in the mid-1960s. At the time, state departments of education had grown concerned about two issues: poor student achievement and poor teacher training. With federal funding through the Education Professions Development Act, education departments began to promote CBE in teacher-training programs. This initial CBE movement did not take hold, though. This was partly because CBE implementation was not monitored, and partly because federal funding for the programs expired in 1977.³⁶

Though CBE had a limited hold on teacher training, as an education theory its roots ran much deeper.

Scientific management

CBE owes some of its theoretical basis to scientific management. In the early 1900s, Frederick Taylor developed scientific management, a method that, drawing on careful analysis and experiments, was used to increase workers' productivity.³⁷ Taylor argued that task analysis was crucial for this process.³⁸ That is, managers, Taylor believed, needed to give workers a complete set of sequenced instructions. These would include production goals and the steps required to meet those goals. These sorts of transparent expectations and discrete instructions lie at the heart of CBE, in which teachers are clear about the standards that students must master, as well as what proficiency looks like.

³⁶ McCowan, Richard. "Origins of Competency-Based Training." Center for Development of Human Services, SUNY, 1998. <http://eric.ed.gov/?id=ED501710>.

³⁷ Ryaby Backer, Patricia. "Scientific Management." *Scientific Management*. Accessed February 19, 2015. http://www.engr.sjsu.edu/pabacker/scientific_mgt.htm.

³⁸ McCowan, Richard. "Origins of Competency-Based Training."

Progressive education

CBE's focus on personalized education also has deep historical roots. At the turn of the 20th century, John Dewey, a philosopher and an educational theorist, developed an education philosophy that emphasized children's interests. His progressive education, as it came to be known, positioned the teacher as a mentor and guide, not as a lecturer. Progressive education considered itself student-centered. It stressed the importance of activities instead of formal instruction, and it gave priority to workshops and vocational education.

Mastery-based learning holds that all students can master material, provided they have enough time and appropriate instruction.

Other educational theories

Several other 20th-century theories informed modern CBE:

- Operant conditioning. Theorized in 1937 by B.F. Skinner, operant conditioning describes learning as a process of habit development.³⁹ Skinner created a careful order for instructional material. He offered material in small, incremental steps.⁴⁰
- Minimum-competency testing (MCT). Educators used MCT to compare schools' performance, as well as to determine whether students should progress to higher grades. MCT, however, eventually came under severe scrutiny. Its critics (including those in *A Nation at Risk*) argued that it set low student expectations.⁴¹
- Instructional design. Developed by Robert Gagné, instructional design held that instruction should grow gradually more complex, with simpler tasks coming before more complex tasks.
- Mastery-based learning. Developed in the late 1960s by Benjamin Bloom, mastery-based learning holds that all students can master material, provided they have enough time and appropriate instruction.⁴² Mastery-based learning focused on specific competencies, as well as learning objectives organized into modules.

³⁹ Staddon, J. E. R., and D. T. Cerutti. "Operant Conditioning." *Annual Review of Psychology*: 115-44.

⁴⁰ McCowan, Richard. "Origins of Competency-Based Training."

⁴¹ Shepard, Lorrie (Ed.), et al. "Standards, Assessments, and Accountability."

⁴² Le, C., et al., "The Past and The Promise."

A MORE DETAILED THEORY OF CBE

So what should a modern K-12 CBE system look like in theory? CompetencyWorks, a subsidiary of the International Association for K-12 Online Learning, provides a detailed description of CBE's components.⁴³ That description, listed below verbatim, almost entirely makes up the Iowa Department of Education's "Guidelines for PK-12 Competency-based Pathways."⁴⁴

Design Principle 1: Students Advance upon Demonstrated Mastery

The core element of a competency-based approach is that students progress to more advanced work upon demonstration of learning by applying specific skills and content. The most important implications of this design principle include:

- Students are advanced to higher-level work upon demonstration of mastery, not age.
- Students work at levels that are appropriately challenging.
- Students are evaluated on performance.
- Some students may complete courses more rapidly than others.
- Teachers guide students to produce sufficient evidence to determine proficiency.

Design Principle 2: Explicit and Measurable Learning Objectives Empower Students

In competency-based practices, a course is organized into measurable learning objectives that are shared with students. Students take responsibility for their learning, thereby increasing their engagement and motivation. The implications of this design principle include:

- The relationship between student and teacher is fundamentally changed.
- The unit of learning becomes modular.
- Learning expands beyond the classroom.

Design Principle 3: Assessment Is Meaningful and a Positive Learning Experience for Students

In a competency-based model, the traditional approach to assessment and accountability "of learning" is turned on its head with assessments "for learning." Formative assessments are aligned with learning objectives. Students receive immediate feedback when assessment occurs. This is used to encourage students to return to difficult concepts and skills until they achieve mastery. It is essential that assessments are student-centered in which students are assessed on material with which they are familiar. In order for competency-based pathways to offer high-quality education, the following must be put into place:

⁴³ "CompetencyWorks - Detailed Definition of Competency Education." Accessed February 19, 2015. <http://competencyworks.pbworks.com/w/page/67945372/Detailed%20Definition%20of%20Competency%20Education>.

⁴⁴ Iowa DOE, "Iowa Department of Education Guidelines."

- Schools embrace a strong emphasis on formative assessment.
- Teachers collaborate to develop understanding of what is an adequate demonstration of proficiency.
- Teachers assess skills or concepts in multiple contexts and multiple ways.
- Attention on student learning, not student grades.
- Summative assessments are adaptive and timely.

Design Principle 4: Students Receive Rapid, Differentiated Support

The core idea of a competency-based model is that all students will master the desired competencies. This requires a rapid response capacity on the part of educators to support students when they are stuck or begin to disengage in frustration. Educator capacity, and students' own capacity to seek out help, will be enhanced by technology-enabled solutions that incorporate predictive analytic tools. This element is essential to a competency-based system. Without it there is risk that the current inequities will be reproduced.

- Pacing matters. Although students will progress at their own speeds, students that are proceeding more slowly will need more help.
- Learning plans capture knowledge on learning styles, context, and interventions that are most effective for individual students.
- New specialist roles may develop in educator and instructional support roles, providing high quality interventions when students are beginning to slip behind.
- Online learning can play an invaluable role in providing feedback to teachers on how students are proceeding.

Design Principle 5: Learning Outcomes Emphasize Application and Creation of Knowledge

Competencies emphasize the application of learning. A high quality competency-based approach will require students to apply skills and knowledge to new situations to demonstrate mastery and to create knowledge. Competencies will include academic standards as well as lifelong learning skills and dispositions.

- Competencies and learning objectives are designed so that demonstration of mastery includes application of skills and knowledge.
- Assessment rubrics are explicit in what students must be able to know and do to progress to the next level of study.
- Examples of student work that demonstrate skills development throughout a learning continuum will help students understand their own progress.
- Lifelong learning skills are designed around students' needs, life experiences, and the skills needed for them to be college and career ready.
- Expanded learning opportunities are developed as opportunities for students to develop and apply skills as they are earning credit.

ACADEMIC RESEARCH SUPPORTING CBE

Academic literature about K-12 CBE is extremely limited. The Maine Education Policy Research Institute, in a 2013 report requested by state legislators, wrote that “there is very little empirical evidence on the effectiveness of these systems. Consequently, there is virtually no empirical research to guide the development and implementation of standards-based or proficiency-based systems....”⁴⁵

Yet that does not mean several components of CBE have gone unevaluated. Both emerging and older research suggest some benefits from core components of CBE.

Personalized learning

A 1996 study, by researchers at Yale and Stanford, found a number of benefits from personalized learning.⁴⁶ In the study, students played a computer game meant to teach arithmetic. Some students were given choice over the design of the game. This, the authors found, increased students’ motivation, their engagement while learning, and their perceptions of their own competence.

In the study, students played a computer game meant to teach arithmetic. Some students were given choice over the design of the game. This, the authors found, increased students’ motivation, their engagement while learning, and their perceptions of their own competence.

Increases in motivation and engagement may be particularly important. According to a recent national survey, teachers and school administrators said that among factors contributing to student achievement, engagement and motivation are the most important. Additionally, only four in ten respondents said that the majority of students in their schools were highly motivated and engaged. In that survey, however, respondents said that students face a number of barriers, and that poor parental support and inadequate school resources were among the leading problems.⁴⁷

⁴⁵ Silvernail, David, Erika Stump, Angela Atkinson Duina, and Lori Moran Gunn. “Preliminary Implementation of Maine’s Proficiency-Based Diploma Program.” Maine Education Policy Research Institute, 2013. <http://usm.maine.edu/sites/default/files/cepare/SBE%20Report.pdf>.

⁴⁶ Cordova, Diana I., and Mark R. Lepper. “Intrinsic Motivation And The Process Of Learning: Beneficial Effects Of Contextualization, Personalization, And Choice.” *Journal of Educational Psychology*: 715-30.

⁴⁷ “Findings from a National Survey: Engaging Students for Success.” Education Week Research Center, 2014.

Applied learning

The study by the Yale and Stanford researchers reached conclusions about contextualized learning, too. Traditionally, they say, teachers present information in abstract and decontextualized forms, “presumably in the belief that learning in this abstract form will promote generalization of that learning.” But that may not help students, they found. In fact, the study found that contextualized learning—teaching students arithmetic with a game, in their example—was also associated with increased motivation and learning.

A report from Harvard’s Family Research Project supports the benefits of applied learning. “It is valuable for learners, especially high school students who become increasingly specialized in their talents and interests, to connect and apply ideas across various community spaces,” the report claims.⁴⁸ A large report by the National Research Council (NRC), of the National Academies, made a similar claim. The report called for educators to connect topics to students’ lives. This, the authors said, was one of several research-backed methods used to develop students’ motivation.⁴⁹

Continuous, formative assessments

Citing research, the NRC report also called on educators to use formative assessments, another central feature of competency-based education. The report advocated assessments that offer students clear learning goals; that continuously monitor student progress, while providing feedback to students; and that give students the chance to perform peer- and self-assessments. The latter of the two is a feature of personalized learning plans in CBE-focused schools.

Non-cognitive skills

CBE advocates also say that the model promotes the development of important non-cognitive skills. According to a report by the federal Department of Education, three skills—grit, tenacity, and perseverance—are crucial for school and adult life. “These factors are essential to an individual’s capacity to strive for and succeed at long-term and higher-order goals,” the report says, “and to persist in the face of the array of challenges and obstacles encountered throughout schooling and life.”⁵⁰

⁴⁸ Lopez, M. Elena, and Caspe, Margaret. “Family Engagement in Anywhere, Anytime Learning.”

⁴⁹ Pellegrino, James, and Margaret (eds.) Hilton. “Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century.” National Research Council, 2012. <http://www.nap.edu/catalog/13398/education-for-life-and-work-developing-transferable-knowledge-and-skills>.

⁵⁰ Shechtman, Nicole, et al. “Promoting Grit, Tenacity, and Perseverance: Critical Factors for Success in the 21st Century.” U.S. Department of Education Office of Educational Technology, February 2013. <http://pgbovine.net/OET-Draft-Grit-Report-2-17-13.pdf>.

On the Ground: Case Studies of Competency-Based Education

So far, this report has looked at competency-based education in theory: its detailed definition, its theoretical features, and the research that supports these features. Yet, just as CBE has been broadly defined, so, too, has it been broadly applied in schools across the U.S. To better understand what CBE looks like in practice, then, this section of the report will consider CBE on a feature-by-feature level, anchored by case studies from several states.

Just as CBE has been broadly defined, so, too, has it been broadly applied in schools across the U.S.

Virtual learning

CBE advocates say that online learning, and in particular blended learning, is a core feature of CBE. Online content, advocates say, can allow students to progress at a flexible pace. This allows students to take tests when they're ready—not beforehand, and not after. Online learning can also help large school systems scale up CBE, since it can be deployed at large levels, advocates say.⁵¹ Finally, advocates say that online learning can make CBE more efficient. While some CBE systems rely on unwieldy portfolios for alternative assessments, online systems allow this material to be neatly organized and accessed, advocates argue.⁵²

⁵¹ Freeland, Julia. "Blending toward Competency: Early Patterns of Blended Learning and Competency-Based Education in New Hampshire." Clayton Christensen Institute for Disruptive Innovation, May 2014. <http://www.christenseninstitute.org/wp-content/uploads/2014/05/Blending-toward-competency.pdf>.

⁵² Bertrand, Clare. "Using Educational Technology to Help Students Get Back on Track." Jobs for the Future, February 2013. http://www.jff.org/sites/default/files/publications/BOT_UsingEdTech-HelpStudents_040913.pdf.

VIRTUAL LEARNING IN REDMOND PROFICIENCY ACADEMY

Redmond Proficiency Academy (RPA) is a sixth-through twelfth-grade charter school in Redmond, Oregon. As its name suggests, the school is anchored in a model of proficiency-based education. Though it doesn't use the word *competency*, the school operates with the principles laid out by groups such as CompetencyWorks.

In its middle school, RPA relies on blended learning for classes in the humanities, sciences, and mathematics. Each week, students spend between 140 and 160 minutes in face-to-face classes with instructors. They spend an equal amount of time working in computer labs, according to the school's executive director, Jon Bullock. These classes are offered in 80-minute blocks each day, four days each week. For about half of those 80 minutes, half of the students receive face-to-face instruction. During that time, the other half of students work in a computer lab, alongside learning coaches, who help them to meet the goals of their individualized learning plans. After those 35-40 minutes are over, the groups of students switch places.⁵³

Discussing this system, Bullock said, "It proves to be very effective from a couple standpoints. Students are constantly engaged in learning. It's at a level in which they can be challenged and successful. There is not a lot of downtime or acting out or misbehaving, which happens when students aren't challenged or are getting instruction beyond them."

RPA's high school is far different, though. There, students generally take blended courses if their goal is only a high school diploma, not a college diploma. The goal, Bullock said, is to help these students to reach state requirements for a diploma. College-bound students may also take online classes if they are interested in a specialized course, like Latin, or if they would like to accelerate through a non-core course such as health. However, students do not rely on blended learning for most advanced high school courses, such as AP English Literature. These courses have very nuanced standards, much more so than those that a blended class can accommodate, Bullock said.

RPA relies on Edmentum Accucess and Plato Courseware for online assessment and instruction. However, if a student wants to take a course that's not available through these packages, RPA will contract out the service to another provider.

⁵³ Bullock, Jon. Phone interview, February 20, 2015. Bullock, Jon.

Project-based learning

CBE advocates call for multiple means of assessment. That may include the presentation of, say, a creative writing portfolio. But CBE proponents also advocate the use of project-based learning, in which students demonstrate competencies in real-world settings.

PROJECT-BASED LEARNING IN PITTSFIELD, NEW HAMPSHIRE

Pittsfield, New Hampshire, has gained national attention among CBE advocates for its use of project-based learning. Superintendent John Freeman explained that project-based learning has “opened the door to allow a lot of personalized creative approaches” to education. Sometimes teachers introduce ideas for hands-on learning opportunities. Sometimes students propose these ideas.⁵⁴

Yet Pittsfield is perhaps best known for its system of extended learning opportunities, or ELOs. For an ELO, a student identifies an out-of-school experience of interest. The school’s designated ELO coordinator works with the student to

identify the competencies he or she might gain from this experience. In one case, Freeman said, a student worked in a veterinary clinic, gaining science competencies. In another instance, a student worked in a genetics lab.

The ELO coordinator works with teachers to refine the list of competencies the student will work to master. The coordinator also connects students with vetted professionals who are willing to take on a student. Assessments are determined before the ELO begins, and can range from a more traditional academic product, such as an essay, to a less traditional product, such as a presentation to school staff. If schools determine that a student has mastered the competency, the student gets credit for its completion.

⁵⁴ Freeman, John. Phone interview, February 10, 2014.

Instructional design

CBE is primarily a structural reform. That is, while it affects instructional delivery, the reform primarily targets schools' overarching systems: the manner in which students advance in grade levels, the measures used to judge mastery, and the expectations held for student achievement. "We don't say teachers have to have a specific instructional approach," Chris Sturgis, of CompetencyWorks, said.⁵⁵

Much of the literature about CBE, then, tends to focus on systemic reform. Still, advocates do note that system reform affects instruction. "In a true competency system, you have a one-to-one correspondence with standards, instruction, assessment, and reporting," said Rick Schreiber, the co-founder and executive director of Re-Inventing Schools Coalition, an organization that, as part of Marzano Research, helps schools transition to competency-based systems of education.

CBE advocates say that teachers must clearly communicate this information to students. Students must know what they'll learn, how they'll be assessed, what competencies they'll be expected to acquire, and how the mastery will be reported.

But, as is the case for much of CBE, the implementation of this vision can vary.

INSTRUCTIONAL DESIGN IN MAINE'S PROFICIENCY-BASED SYSTEM

In 2012, Maine's legislature passed LD1422, a law that requires the state, by 2017, to transition to a proficiency-based system of high school diplomas. The law does not specifically bar the use of the Carnegie Unit. Some local districts, though, have moved away from it.⁵⁶

Still, Maine's legislation calls for a proficiency-based education system, and it contains elements considered crucial to CBE. Students cannot graduate high school unless they have demonstrated proficiency in state standards, in all content areas. Additionally, according to the law, students can demonstrate proficiency in multiple ways, including "teacher-designed or student-designed assessments, portfolios, performance, exhibitions and projects."⁵⁷

So, how has Maine's law affected in-class instruction? The results are mixed, according to a 2013 report commissioned by the legislature and written by the Maine Education Policy Research Institute. When the report was written, some schools had already been at work implementing a proficiency-based system. These further-ahead schools (about four years' worth of reform) had less whole-class instruction, with some students often working on their own. In these scenarios, teachers act more as facilitators than instructors.

⁵⁵ Sturgis, Chris. Phone interview, February 23, 2015.

⁵⁶ Stump, Erika. Email interview, February 20, 2015.

⁵⁷ Silvernail, David, et al. "Preliminary Implementation of Maine's Proficiency-Based Diploma Program."

Yet, on the whole, little has changed for the in-class experience of Maine's students. "[A]pparent changes in instruction were not systemically evident in practice at most of the schools in our study, regardless of implementation level," the report says.

The report's authors say that, during the initial phases of reform, teachers have been most concerned by the increased need for planning and preparation, since individually paced students potentially required individual lesson plans. Some schools tried to simplify this issue by breaking instruction into three levels: below teacher pace, at teacher pace, and above teacher pace. However, the report authors note a lack of consistency about "teacher pace." This is an issue that school administrators are beginning to address, in large part by developing scope and sequence curricula for each grade level.

In a related issue, the report's authors note that proficiency-based education has affected teachers' amount of direct instruction: "Many teachers and leaders indicated that the theoretical model of instruction they had envisioned included a significant amount of direct instruction. But, in reality, managing so many different levels of learning and so many student needs did not allow teachers to interact directly with all students as much." Parents and students were concerned about this loss, and complained that too much instruction took place online or with worksheets.

Grade levels

According to many CBE advocates, in a true competency-based education system, grade levels lose their traditional meaning. Instead of advancing with a same-aged cohort, students advance when they have demonstrated mastery or proficiency of a subject. This information is gleaned from diagnostic assessments.

This means some students will move faster than their peers, and some will move slower. But students won't be in Algebra I, for example, simply because they are 13 years old; they will be in the class when they are academically ready.

GRADE LEVELS IN CHUGACH, ALASKA, AND NEW HAMPSHIRE

Chugach School District serves a geographically dispersed group of students in rural Alaska. It is a very small school district, with about 200 students.

In the 1990s, with frustration about persistently low test scores, the school district and parents began to think through a reformed system of education. They emerged with what may have been the first competency-based system of K-12 education in the U.S.

As part of the system, students are placed in classes based upon their developmental level, according to the district's superintendent, Robert Crumley. They do not progress to more challenging subjects until they have mastered simpler material.

That means a struggling ninth grader may work in the same math class as a sixth grader. Initially, Crumley said, this worried parents. But “it’s worked out very well,” he said. Students each had an individualized learning profile, and so they understood their own strengths and weaknesses. One student, for example, may be a level 5 in math, a level 6 in science, and a level 8 in career development, Crumley said. Knowing that, students are sympathetic with each other.

Students grew more comfortable with this arrangement, and soon parents grew more comfortable, too. But Pittsfield didn’t leave this outreach entirely to students. The district led numerous community meetings, which, Crumley said, were crucial for gaining parents’ support.

Students are grouped by their levels of competence, yet from the state government’s point of view, they still belong to discrete grade levels, Crumley said. The state still requires Chugach to report students in traditional grade levels. “They’re in grade levels, they just don’t know it,” he said.

New Hampshire, which has a statewide system of CBE, maintains traditional grade levels. According to Fred Bramante, the former chairman of the state’s board of education, age-based cohorts are “firmly entrenched” throughout the state; state regulations allow local districts to shape their own CBE policies. So far, students have remained tethered to their grades based upon their ages.

School hours and the academic calendar

At the center of CBE is the disentangling of student advancement and seat time. CBE judges mastery based upon a student’s demonstration of competence—not the amount of time a student spends in class.

This approach has potentially large consequences for nuts-and-bolts logistics of school services, such as school hours, after-school athletics, and bus schedules. While CBE proponents call for “anywhere, anytime learning,” few CBE-focused schools have moved beyond the traditional school day or calendar. Advocates at the Nellie Mae Education Foundation argue, “The rigidity of district, state and federal regulations on the subject, combined with the conventional wisdom that ‘this is how it’s always been done,’ make it difficult to make major structural changes.”⁵⁸

PITTSFIELD, NEW HAMPSHIRE’S SCHOOL CALENDAR

In Pittsfield, New Hampshire, the traditional school year still circumscribes academic progress. But that doesn’t best serve students, according to the district’s superintendent, John Freeman. “Does a student need to be in class 180 days? We think the answer is no,” he said.⁵⁹ Yet so far, the school district has not been able to move away from a traditional schedule. Nor has it established policies that would allow students to gain credit mid-year—after, for example, mastering Spanish 2 in the middle of a semester—though the district is currently working to change this.

⁵⁸ Priest, Nora, Antonia Rudenstine, and Ephraim Weisstein. “Making Mastery Work.”

⁵⁹ Freeman, John. Phone interview.

Report cards

CBE advocates argue that traditional A-F grading is deeply flawed. For one, they say, it obscures true performance, since an A+ in one chemistry course may reflect significantly different performance from that in another course.⁶⁰ More broadly, CBE advocates argue that traditional grading systems undermine students' learning, giving them incentives for short-term learning, while allowing them to advance without having mastered skills.⁶¹ CBE advocates also say that traditional grading creates a vicious cycle for low performers, whose low grades perpetuate a belief that they cannot succeed.

A competency-based grading system, according to CompetencyWorks, should be based on the following six principles:

1. Embrace explicit learning progression or standards so that everyone will have a shared vision of what students should learn.
2. Develop a clear understanding of levels of knowledge so that students and teachers share an understanding of what proficiency means.
3. Ensure transparency so that educators, students, and parents all understand where students are on their learning progression.
4. Create a school-wide or district-wide standards-based grading policy.
5. Offer timely feedback and meaningful reassessments so that students can continue to progress and stay on track.
6. Provide adequate information infrastructure to support students, teachers, and school-wide continuous improvement.⁶²

Tracking progress, and reporting it on report cards, should take a fundamentally different approach from what educators traditionally do, advocates say. CompetencyWorks argues that teachers should track students' progress on different competencies, not simply their scores on homework and tests. Report cards should contain significantly more information about student achievement, the group says, and should separate academic proficiency from "lifelong learning competencies."

⁶⁰ Worthen, Maria, and Lillian Pace. "A K-12 Federal Policy Framework for Competency Education: Building Capacity for Systems Change." CompetencyWorks, February 2014. http://www.competencyworks.org/wp-content/uploads/2014/01/CompetencyWorks_A_K-12_Federal_Policy_Framework_for_Competency_Education_February_2014.pdf.

⁶¹ Sturgis, Chris. "Progress and Proficiency: Redesigning Grading for Competency Education." CompetencyWorks, January 2014. <http://www.competencyworks.org/wp-content/uploads/2014/01/CW-Progress-and-Proficiency-January-2014.pdf>.

⁶² Ibid.

REPORTING SYSTEMS IN PITTSFIELD, NEW HAMPSHIRE; REDMOND PROFICIENCY ACADEMY; AND MAINE

The experiences of three sets of schools helps illuminate the possibilities—and the drawbacks—for competency-based report cards.

In Pittsfield, New Hampshire, the school district has let go of traditional A-F grading. Students receive 1-4 scores on rubrics. These rubrics list competencies that they're responsible to master. The district distinguishes between open competencies and closed competencies. Open competencies are those that take longer to master, lasting even as long as a school year. Closed competencies, on the other hand, may only apply to a single assignment. Report cards include both open and closed competencies, and scores are averaged so parents have a more traditional method to evaluate their children's performance. John Freeman, the district's superintendent, said that the shift to competency-based report cards was jarring at first for students and faculty. Yet the region is supportive of CBE, he said, and so non-traditional report cards are not an issue for colleges.

Redmond Proficiency Academy sees it otherwise. Grading, according to school Executive Director Jon Bullock, has been one of the toughest issues for the school.⁶³ "We have to translate how we assess students onto the A, B, C model. That's what the rest of the world uses," Bullock said. He noted that parents were educated with the traditional grading model, and that using an alternative model creates confusion, while hurting the school's marketability. Additionally, Bullock said that when Oregon tried to decouple grades from student behavior, the state faced a backlash from the teacher union. "In a large-scale implementation, that would be the hardest thing to implement," he said.

At RPA, students do receive competency-based grading on individual assignments. Teachers and administrators provide informal narrative assessments to parents, too. Yet, at the end of terms, teachers must operate in what Bullock called a "black box of translation," in which they convert individualized, self-paced student-achievement data into traditional letter grades. These grades comprise an accumulation of student work, with greater weight given to students' most advanced performances.

⁶³ Bullock, Jon. Phone interview.

In Maine, too, parents expressed concern about alternative report cards, fearing that non-traditional reporting could harm university admissions and military enlisting. Maine's researchers, with the Maine Education Policy Research Institute, spoke with college-admissions officers and found some evidence to support these concerns. Admissions officers said that alternative transcripts are accepted. However, if the transcripts aren't easy to compare to other applicants', other factors (SAT scores, essays, and school reputation) will be weighted more heavily. Likewise, the report details one parent who reportedly spoke with a military branch, and learned that a traditional GPA must be included on a transcript in order to enlist.

New Hampshire, which has a state-wide system of CBE, maintains traditional grade levels. According to Fred Bramante, the former chairman of the state's board of education, age-based cohorts are “firmly entrenched” throughout the state; state regulations allow local districts to shape their own CBE policies.

Personalized learning plans

CBE proponents also advocate the use of personalized learning plans. These plans provide information about the competencies a student has attained, as well as those yet to be mastered. Ideally, this plan is informative for students, teachers, parents, and school staff.⁶⁴

⁶⁴ Glowa, Liz. “Re-Engineering Information Technology Design Considerations for Competency Education.”

The Work to Develop Performance Standards and Competencies

Competency-based education responds to two questions. First, what should students be able to know and do? And second, what constitutes mastery of this knowledge and these skills? These questions form the basis of content standards, competencies, and performance standards, three sets of standards that are crucial in CBE.

To understand why, it helps first to have clear definitions of each of these terms.

Content standards

Content standards encompass the knowledge and skills that students are expected to acquire. Content standards address specific subjects, such as math.⁶⁵

Performance standards

Performance standards, like a rubric, explain how well students must perform in order to demonstrate proficiency in content standards. Goals 2000: Educate America Act, a 1994 education law signed by President Bill Clinton, defined performance standards as “concrete examples and explicit definitions of what students have to know and be able to do to demonstrate that such students are proficient in the skills and knowledge framed by content standards.”⁶⁶

With performance standards, students might need to correctly answer 70 percent of a test's questions, for example, in order to be judged proficient.

Performance standards, like a rubric, explain how well students must perform in order to demonstrate proficiency in content standards.

⁶⁵ Shepard, Lorrie (Ed.), et al. “Standards, Assessments, and Accountability.”

⁶⁶ Goals 2000: Educate America Act. <http://www2.ed.gov/legislation/GOALS2000/TheAct/sec3.html>.

Competencies

As mentioned before, the Iowa Department of Education defines a competency as “an enduring understanding that requires the transfer of knowledge, skills, and dispositions to complex situations in and/or across content areas and/or beyond the classroom.”

So, how is a competency different from a standard? The answer partly has to do with scope, according to CompetencyWorks' Chris Sturgis. “[I]n general a competency is a big idea, not at the granularity of standards,” Sturgis said.⁶⁷

The distinction also lies in the idea that, in order to be competent, students should be able to apply learning outside the classroom. Rose Colby, an educator and CBE consultant, wrote that “competency implies much more than content and skills. By its very definition, competency requires that a student be able to transfer content and skill in a particular setting.”⁶⁸

FITTING THE PIECES TOGETHER

Content standards, performance standards, and competencies describe what educational mastery looks like, both in and out of the classroom. But these three terms raise a logistical question: What do educators actually do with these structures?

Rose Colby explains that these standards create a hierarchical framework to evaluate student mastery. At the top is a competency.

Example competency, from Colby: “Students will demonstrate the ability to analyze structure in expressions.”⁶⁹

This is a top-level goal for student mastery. To demonstrate mastery of this concept, educators can use performance indicators. In her example, Colby uses Common Core standards as performance indicators. These Common Core standards serve as the basis for formative and summative assessments.

Colby organizes the Common Core standards by the depth of knowledge they require. Visually, the hierarchy looks like this:

Competency: “Students will demonstrate the ability to analyze structure in expressions.”

Performance Indicators: “I can...”

Strategic and Extended Thinking:
Levels 3 & 4 Depth of Knowledge:

1. Apply properties of operations to rewrite complicated expressions in multiple ways where possible.
2. Analyze an expression, apply concepts of writing expressions in equivalent forms to solve problems.

... (Performance indicators are cut for the sake of brevity.)

Recall: Level 1 Depth of Knowledge:

1. Identify parts of expressions using appropriate language of mathematics (exponent, coefficient, base etc).
2. Identify types expressions (monomial, binomial, polynomial, constant, etc).

⁶⁷ Sturgis, Chris. Email interview, February 24, 2015.

⁶⁸ Colby, Rose. “Is a Standard a Competency? (Part 1) « Competency Works.” Accessed February 24, 2015. <http://www.competencyworks.org/how-to/is-a-standard-a-competency-part-1/>.

⁶⁹ Colby, Rose. “Is a Standard a Competency? (Part 2) « Competency Works.” Accessed February 24, 2015. <http://www.competencyworks.org/how-to/is-a-standard-a-competency-part-2/>.

Colby does not explicitly include performance standards in this hierarchical framework. Yet for CBE advocates, performance standards are an important facet of transparency. Advocates say that, in CBE, expectations for students should be completely clear. Students should know what they're expected to learn and what mastery looks like.⁷⁰ These standards could be included side-by-side with performance indicators, or included separately.

Some supporters of CBE skip the overarching competency as an organizing feature. The Re-Inventing Schools Coalition is preparing to release a complete package of proficiency scales and assessments, aligned with content standards. In this package, RISC creates a four-point proficiency scale that's tied to standards. Each proficiency score describes what students are able to know and to do, and the scores are organized by an increasing level of cognitive complexity—retrieval, comprehension, and analysis. In separate charts, RISC aligns each of these proficiency scores with assessment items, offering a clear path of student advancement.⁷¹

STATES' WORK IN THIS AREA

In New Hampshire, the state board of education has approved a set of Common-Core-aligned competencies for high school math and ELA. The math document connects competencies to specific CCSS standards, though the ELA document only aligns competencies with CCSS content clusters.

New Hampshire has also approved a list of K-12 science competencies and “work-study practices.” The latter includes non-subject-area-specific competencies such as creativity and collaboration. Last, the state also offers draft competencies for several courses, including language courses. New Hampshire's work can be found online at http://www.education.nh.gov/innovations/hs_redesign/competencies.htm.

Though the state board of education approved these competencies, local school districts have complete discretion whether to adopt them. In many cases, local districts have struck out on their own. “There are eighty-five high schools in New Hampshire,” said John Freeman, the superintendent in Pittsfield. “There are at least eighty-five math teachers working on Algebra I competencies.”⁷²

Maine has had a similar experience. “For the most part, the end result of how standards were worded, clustered or associated with grade-level benchmarks was not systemic or common outside of districts,” according to the report on Maine. “This appeared to result in potentially very different expectations of student learning at certain levels across districts.”

As mentioned before, in 2016, the Re-Inventing Schools Coalition (RISC), a division of Marzano Research, plans to offer a complete K-12 package to fill this gap. The package will be aligned to content standards. It will include grade-level proficiency scales, pre-assessments, and post-assessments. The package will cover science classes and character development, too. The price for the package has not yet been set.

⁷⁰ Le, C., et al., “The Past and The Promise.”

⁷¹ “3rd Grade English Language Arts Sample of Proficiency Scales.” Re-Inventing Schools Coalition, n.d. <http://www.reinventingschools.org/wp-content/uploads/2014/07/3rd-Grade-Sample.pdf>.

⁷² Freeman, John. Phone interview.

Numerous other schools, in several U.S. states, have developed their own sets of competencies and performance standards, aligned with content standards. Sometimes this work takes place on a district level, and sometimes it takes place at a school level. In the case of Redmond Proficiency Academy, in Oregon, the work takes place at the classroom level, with individual teachers developing their own competencies, performance standards, and assessments.⁷³

REQUIRED TIME TO DEVELOP MATERIALS

Developing a complete set of competencies, for all grades and all subjects, and aligning them with content standards and performance standards, is a mammoth task, according to Rick Schreiber, of RISC. In a large district, the process can require a few years' worth of work, he said.

RISC has worked with many schools and districts to do this. In some cases, schools have been able to adapt others' standards, which can save time. Regardless, Schreiber said, school districts "have to own" the process by developing standards unique to their circumstances.

John Freeman, the superintendent in Pittsfield, agreed that developing these materials takes time. Freeman said that his teachers and staff spent two years developing this material. Teachers first spent time in professional development to understand CBE. Then they worked to identify the most important competencies in core subjects, using content standards and other documents as guidance. They evaluated these competencies with the state's validation rubric, and they developed new course materials, including syllabi and proficiency rubrics.⁷⁴

In Kenowa Hills Public Schools, near Grand Rapids, Michigan, administrators and teachers have come to see that this work is highly demanding. Kenowa Hills is in an early phase in its CBE implementation; so far, it has only implemented a proficiency system for K-8 math classes. Yet the work to develop competencies and performance standards has been immense, according to Mike Burde, who oversees the district's curriculum. Last year, teachers and administrators invested more than 11,000 paid hours for this work; these hours are detailed more fully later. Additionally, teachers have invested unpaid hours in the work. "Our teachers are putting in hours outside of their contractual obligations," Burde said.

Kenowa Hills is in an early phase in its CBE implementation; so far, it has only implemented a proficiency system for K-8 math classes. Yet the work to develop competencies and performance standards has been immense.

Burde said, though, that for schools that are new to CBE, this process is important. It's not a good idea to simply adopt another school's or district's work verbatim, he added. "It's a pretty dangerous pathway to grab work others have done," he said. "At the end of the day, it has to be about Kenowa Hills. It can't be about Alaska or Maine."

⁷³ Bullock, Jon. Phone interview, February 25, 2015.

⁷⁴ Freeman, John. Phone interview.

Technology and Student Information Systems

K-12 schools use student information systems (SISs) to track a variety of data, including attendance, grades, and test data. Yet much of this data is predicated on a traditional school model; SISs are built around time-based credits, A-F grading, annual calendars, and numeric test data. A transition to CBE, then, potentially requires an overhaul of SISs.⁷⁵

A transition to CBE, then, potentially requires an overhaul of SISs.

CompetencyWorks outlines a vision for a competency-oriented student information system: “We need to build smart information technology (IT) systems that chart levels of proficiency, compile portfolios of student work, offer pathways to competency, and capture meaningful assessment down to the level of the academic standards.”⁷⁶ In its brief on competency-based SISs, CompetencyWorks identifies several elements it views as critical to redesigned SISs. Those include student profiles, with standard-by-standard progress, and long-term student data, so teachers and administrators can track student mastery over time. These features, CBE advocates say, allow teachers to respond more accurately to student needs, which improves instruction and school accountability.

⁷⁵ Glowa, Liz. “Re-Engineering Information Technology Design Considerations for Competency Education.”

⁷⁶ Ibid.

SOFTWARE AVAILABILITY

As ComptencyWorks acknowledges, competency-oriented SISs are limited in the market: “There is no ‘one size fits all’ or off-the-shelf IT solution for implementing a systemic approach to competency education.” As a result, schools have largely struck out on their own. Schools have either developed entire SISs from scratch, or they have modified current SISs, like PowerSchool, to support competency measures.

In Chugach, Alaska, the school district contracted software developers in India to develop a unique SIS. Robert Crumley, the district’s superintendent, said that he has weekly meetings with these developers. These meetings allow staff to provide suggestions for improvement. They’ve also led to a growing range of SIS features, including the ability to track varied student pace and varied forms of instruction, including blended learning.

In Pittsfield, New Hampshire, faculty members developed a new template for PowerSchool. Though the modified SIS supports CBE, the work to develop it was arduous, according to District Superintendent John Freeman. School staff, too, have found themselves frustrated with its limitations.

As ComptencyWorks acknowledges, competency-oriented SISs are limited in the market: “There is no ‘one size fits all’ or off-the-shelf IT solution for implementing a systemic approach to competency education.”

Schools in Maine found themselves similarly limited. The researchers who surveyed Maine’s transition to CBE wrote, “Both teachers and educational leaders stated that a working, accessible learning management system housing common learning materials and professional resources that teachers can personalize for their classrooms and students would alleviate a great deal of professional time and stress.”⁷⁷

Even when schools do reprogram these SISs, the software can remain limited. Systems such as PowerSchool and Infinite Campus lack support for self-paced learning, the tracking of proficiencies across years, and different levels of access for different users.⁷⁸

As schools wait on the private sector to develop new software, they’ve also found lower-tech approaches. Some schools use wall charts and stickers so students can track their own progress on standards.

⁷⁷ Silvernail, David, et al. “Preliminary Implementation of Maine’s Proficiency-Based Diploma Program.”

⁷⁸ Priest, Nora, Antonia Rudenstine, and Ephraim Weisstein. “Making Mastery Work.”

These limitations may be changing, though. A private company, ThreeShapes, has developed what some say is a comprehensive learning management system/SIS for competency education. The software is called Empower. Kenowa Hills, Michigan, has begun to use Empower, according to Mike Burde, who oversees the district's curriculum. Burde said that Empower offers all the features necessary for competency-based education, including the ability to create individualized learning plans for students, with integrated assessments and learning resources. Empower also can track mastery, on a standard-by-standard basis; produce proficiency-oriented report cards; and embed standards across different academic disciplines, in addition to a host of other features.

A representative at Empower said that most schools use the software in tandem with popular SIS programs, such as PowerSchool. Empower does not have the ability to track scores from statewide tests, for example. The program does, however, allow administrators to track some student information, including race and contact information.

Michigan is also leading the way toward CBE-friendly software. Through the Technology Readiness Infrastructure Grant, intermediate school districts are working to develop regional data hubs. These hubs will allow for a standardized exchange of information between SISs and other data systems. This will allow for more seamless integration with third-party CBE software. It will also better allow Michigan schools to compare their CBE data.

CONSIDERATIONS ABOUT FEDERAL REPORTING

CBE, in theory, abolishes grade levels. It allows students to move at their own pace, in order to master competencies required for higher levels of learning.

This raises a potential issue for federal education policy. Under No Child Left Behind, states must report test data separated by grade level.⁷⁹ This accountability model still fundamentally relies on the notion of age-based cohorts. When developing SISs, then, schools, districts, and states must still account for grade levels—at least for the sake of federal reporting requirements.

⁷⁹ "Report Cards Title I, Part A: Non-Regulatory Guidance." U.S. Department of Education, September 12, 2003. <http://www2.ed.gov/programs/titleiparta/reportcardsguidance.doc>.

CBE's Effects on Equity and Motivation

According to advocates, CBE can improve students' love of learning and motivation.⁸⁰ Because students know what's expected of them, and because they have greater control over their education, students are more invested in their learning, advocates say. CBE's advocates also argue that the system can decrease achievement gaps, since struggling students receive more personalized attention, and teachers can more readily individualize instruction.⁸¹

Yet advocates and practitioners admit a worrisome trend: some students struggle even more in a competency system, given their increased freedoms. In Maine, school staff have grown concerned about students' respect for due dates, as well as students' work habits. Students said they enjoyed the increased choices about assignments. Yet they, along with parents and teachers, admitted that intrinsic motivation was a particular challenge.⁸²

Jobs for the Future, an organization that advocates CBE, acknowledges this problem. "In a system where students have to demonstrate skills and knowledge to move forward, there might well be a 'rich get richer' and 'poor get poorer' effect: those whose backgrounds afford them a richer array of learning environments and who begin school already having acquired more skills may keep increasing the distance between themselves and their less fortunate peers."⁸³ The group admits that this is more than a theoretical worry. Teachers in CBE-focused schools noted their "serious concerns" about struggling students who are disengaged and have not yet learned to persevere through challenges.

The problem stems in part from students' challenges with self-regulation. In competency education, self-regulation is "critical," Jobs for the Future notes. At the same time, struggling students often perform poorly on tasks that require self-regulation.

⁸⁰ Priest, Nora, Antonia Rudenstine, and Ephraim Weisstein. "Making Mastery Work."

⁸¹ Lewis, Matthew, et al. "Equity in Competency Education: Realizing the Potential, Overcoming the Obstacles." Jobs for the Future and RAND Education, October 2014. <http://www.jff.org/publications/equity-competency-education-realizing-potential-overcoming-obstacles>.

⁸² Silvernail, David, et al. "Preliminary Implementation of Maine's Proficiency-Based Diploma Program."

⁸³ Lewis, Matthew, et al. "Equity in Competency Education."

“It was stunning how quickly kids got behind,” Freeman said. With students working at their own pace, many slowed down, he said, though some did graduate early.

In Pittsfield, New Hampshire, this has been a challenge, according to the district’s superintendent, John Freeman. The problems surfaced in the district’s first year of CBE. “It was stunning how quickly kids got behind,” Freeman said. With students working at their own pace, many slowed down, he said, though some did graduate early.

EFFECTS ON THE ACHIEVEMENT GAP

CBE, then, poses a unique problem for achievement gaps between students of different ethnicities and socioeconomic backgrounds. Advocates say that CBE can close achievement gaps, since it forces students to master material, rather than moving to new material with incomplete mastery.

Yet, without interventions, struggling students may dig themselves into deeper academic holes. CBE poses other problems for educational equity as well. With its “anywhere, anytime” approach, CBE allows students to earn credits in nontraditional settings—say, by interning over the summer in a genetics lab, or by working after hours with a tutor. Yet economically disadvantaged students may not have access to those resources.

Well-planned interventions may be key, then, for students who struggle with competency education. For one, teachers may need to explicitly focus on non-cognitive abilities, such as self-regulation and perseverance. Additionally, teachers may need to offer greater individualized support for struggling students.⁸⁴

Well-planned interventions may be key, then, for students who struggle with competency education.

⁸⁴ Ibid.

Planning for Change

Groups that advocate competency-based education, and schools that have implemented CBE, say that successful reform depends critically on outreach—to local communities and school staff. The parties most affected by CBE must believe in the value of reform. Similarly, without enough attention paid to engagement, administrators have found themselves at the center of anger and controversy.

A look at several case studies helps illustrate how educators have built support for CBE—and how at times they have faltered.

BUILDING SUPPORT ACROSS THE COMMUNITY—AT THE STATE LEVEL

Perhaps most relevant for Michigan is the experience of educators in New Hampshire. New Hampshire has embraced competency education in K-12 education. Yet these changes, formalized in 2005, did not happen overnight.

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The educational overhaul had its roots in 1998, when the state's education department, using federal funds, piloted a series of CBE models in volunteer high schools. These pilot projects included 14 high schools by 2001. By 2003, the opportunity was opened for K-12 schools, expanding the total number of pilot projects to 30 schools in the state.⁸⁵

At the same time, the education department began the work of large-scale outreach. The department created a High School Leadership Team, which would be responsible for gathering data to support a new vision for high schools. This vision would be based on extensive public comment.

⁸⁵ Ezen, Paul et al. "High School Leadership: Preliminary Report." State of New Hampshire Department of Education, March 2005. http://education.nh.gov/innovations/hs_redesign/documents/prelim_report.pdf.

To begin soliciting these comments, in May 2004, the state education department hosted an education-reform workshop. Attendees included educators, administrators, policy makers, and members of the business community. At the workshop, attendees offered their visions for high school reform. Their proposals included many of the student-centered ideas that became the hallmarks of the state's reforms.

Throughout 2004, the education department continued to solicit opinions from the public, including in three forums for school staff and students. Again, attendees were asked to describe an ideal high school. And again, many of these ideas, including project-based learning, matched the policies the state would eventually adopt. Later in 2004, the education department held nine focus groups about expectations for high school students. Attendees included principals, superintendents, career and technical education program directors, community organizations, parents, and businesses.

In January of 2005, the High School Leadership Team reviewed all of these stakeholder comments, preparing to develop the state's vision for high school. After isolating popular suggestions, the group held yet another forum, which allowed stakeholders to talk more extensively about the popular suggestions generated during previous forums. Once again, stakeholders included a broad swath of educators, community members, school staff, and local families.

For the next two years, the state drafted its vision document. Its finished document, released in 2007, detailed many contours of competency education, informed by hundreds of comments from the public.

Yet this vision document was not the basis of the state's new regulations, which upended traditional education.

The regulations, in fact, had already been adopted in July of 2005. Fred Bramante, then the chair of the state's board of education, said that the proposal for CBE began with top-level government officials, beginning in 2003—the year before the public forums were first held. Though the proposal developed among officials, the education board held five informational hearings for the public, more than the required minimum. These were two-way, conversational hearings, which Bramante said helped build support for the regulations.

So, if it didn't shape regulations, what was the purpose of the vision process, with its extensive gathering of public comments? Ultimately, Bramante said, the vision described, in fuller detail, what the regulations allowed schools to do—how schools could completely redesign education, given a new set of state policies. The regulations did require structural changes to education. But how those changes were implemented, he said—that was what emerged from the public process.

COMMUNITY ENGAGEMENT AT THE SCHOOL LEVEL

In New Hampshire, community engagement didn't only take place in state-sponsored forums; individual districts took up the challenge, too.

John Freeman, the superintendent in Pittsfield, said that his district had read about community backlash in other districts. The district believed in the reforms, but it didn't want to alienate parents. So it held a series of events to build support among the local community. The district also developed an overarching community-outreach plan, which included community events.

These events included an evening in which teachers demonstrated for parents the district's new reporting system. Computers were available for parents, and teachers were there to help. To sweeten the deal, the district held a pig roast.

The district also held forums for parents, and it reached out to parent groups. The goal, Freeman said, was to show that reform was a positive change for schools—one that would increase schools' accountability to the community.

The district believed in the reforms, but it didn't want to alienate parents. So it held a series of events to build support among the local community. The district also developed an overarching community-outreach plan, which included community events.

THE FIGHT IN MAINE OVER REPORT CARDS

If pig roasts and public forums improve community support, then their opposite—a sense among parents that reform is being hoisted on them—can lead to trouble.

At Maine's MSAD 16 school district, students in elementary grades began using standards-referenced report cards in 1999. But in 2002, a new superintendent intensified the effort to use standards-based reporting in all grades. The superintendent and teachers developed new K-12 curricula, assessments, and rubrics. Increasingly, teachers were supportive of the move to proficiency-based system of education.⁸⁶

⁸⁶ "The Long Conversation, Or, 'It's Hard, but Worth It. Did I Mention That It's Hard?'" Accessed March 3, 2015. <http://maine.gov/doe/cbp/case-studies/rsu2-case-study.html>.

Yet the process had largely taken place within schools. Parents and community members hadn't been engaged in the process. In 2008, that changed when high school parents were invited to a meeting about a proposed new system of reporting. According to Maine's education department, "the meeting was contentious from the beginning and became angry enough that it is still remembered by some participants in this study as 'that meeting.'" Parents objected to a new standards-based system of reporting, arguing that it would hurt college admissions, and that by removing GPA-based ranking, the system would leave students unprepared for the world outside school.

This meeting marked the beginning of parents' and the administration's mutual distrust. Parents felt as though a new system were being implemented in the dark, and that the administration was not interested in collaboration.

The school board and district administration decided to remedy this situation. They formed a team of administrators, teachers, and parents, who worked together to draft recommended policies for grading and graduation, among other topics. Still, parents felt dismissed while working in this group. Teachers, too, felt frustrated, believing that parents showed little sympathy for their views.

Still, the group managed to produce a series of policy recommendations, leading the school board in 2009 to change high school grading to a standards-based system, one year at a time.

THE IMPORTANCE OF TEACHERS' SUPPORT

For Kenowa Hills, Michigan, teacher support was crucial for the district's transition to a competency-based system of education.

"What we've learned is, a compelling vision is critical to the process," said Mike Burde, who oversees the district's curriculum. Before initiating a CBE system, Kenowa Hills teachers voted on the issue. Administrators agreed that, if they were to make such a drastic change, they wanted 80 percent of staff to approve the plan. It was what Burde considers a supermajority requirement.⁸⁷

When the votes were tallied, 81 percent of the staff voted in favor of competency education. That sort of buy-in—and the sense of investment in a new system of education—is crucial, Burde said, considering the amount of energy teachers would dedicate to the new system. Planning such a large change would not only take up professional development time, but teachers often found themselves working on materials in their free time.

This work has been critical, but in order for teachers to do it, they need to support a vision for reform, Burde said. "The foundation for all of this is a vision for a better way of doing business," he said.

⁸⁷ Burde, Mike. Phone interview, March 1, 2015.

The Role of Public Policy

Michigan's education statutes and education code allow districts to incorporate many elements of competency-based education.⁸⁸ Still, schools face some legal limitations.

LEGAL OPTIONS AND REQUIREMENTS

Proficiency requirements for credit

Minimum seat-time requirements (described more fully later) may organize students' academic calendars. Yet in Michigan high schools, academic credit is not based on seat time.

The intent of the Michigan Merit Curriculum law is that high school students demonstrate content mastery in order to gain credit. The Michigan Department of Education (MDE) describes content standards for each subject, and students must demonstrate mastery, in part, through assessments. Districts determine the assessments and the criteria for mastery.⁸⁹ In this sense, Michigan already relies on a proficiency-based—or competency-based—system of credits.

Seat time waivers for virtual learning

Districts can apply to the state superintendent for a seat time waiver, which offers increased flexibility for virtual learning. The state currently offers two kinds of waivers:

- 100 percent online seat time waiver. This allows districts to offer a student's instruction entirely online. Students do not have to attend schools in person, though a district may include a lab component or "drop in" as needed. Under this waiver, a district may enroll 25 percent of pupils. These are students in grades 6-12. Public school academies chartered through intermediate school districts can only enroll 10 percent of students from the ISD's combined region.
- Blended learning waiver. Students must receive onsite, face-to-face instruction at least 50 percent of the time, with online learning accounting for the rest. There is no limit on the number of students who participate.

Additionally, students in grades 6-12 may enroll in up to two online courses per year without a seat time waiver.

⁸⁸ "Flexible Learning Options." Michigan Department of Education, n.d. http://www.michigan.gov/documents/mde/Flexible_Learning_v5.20.14_posted_457457_7.pdf.

⁸⁹ "Michigan Merit Curriculum High School Graduation Requirements." Michigan Department of Education, August 2014. http://www.michigan.gov/documents/mde/Complete_MMC_FAQ_August_2014_467323_7.pdf.

21F online learning

Under section 21F of the State School Aid Act, students in grades 6-12 are eligible to enroll in online classes through micourses.org. These courses are available for students in a public local district or public school academy. Under this program, students may enroll in up to two online courses per semester, trimester, or academic term. If a student demonstrates success in online courses, he or she may enroll in more than two courses.⁹⁰

Out-of-school work credits

School districts may award high school credit for work-based learning experiences that take place out of school. Districts must coordinate the experience, and a certified instructor must monitor it. The experience is limited to one-half of a student's full-time equivalency status, and the employment cannot exceed the hours set by the district.

Credit from college coursework

Students in public schools and approved non-public schools can take up to 10 college courses while in high school. Additionally, districts and ISDs can operate early college programs, in which students earn a high school diploma, an associate's degree, 60 credits for college, or a merit certificate.

⁹⁰ "FAQ for Section 21f of the State School Aid Act." Michigan Department of Education, September, 2014. http://media.mivu.org/institute/pdf/21F_FAQS.PDF.

⁹¹ "Personal Curriculum: Parent and Educator Guide." Michigan Department of Education, January 2015. http://www.michigan.gov/documents/mde/PC_Guide_1_2015_482101_7.pdf.

Career and technical education

Under the Michigan Merit Curriculum, academic content can be embedded within CTE programs. Students must, however, demonstrate proficiency on state standards.

Testing out to earn credit

Under the state's revised school code, students may earn credit by testing out of course requirements.

Personalized Curriculum

Michigan's Personal Curriculum allows students to gain a high school diploma with credit requirements that diverge from the Michigan Merit Curriculum. The process is intended to serve students who seek accelerated learning, as well as students who require other modifications for their credit requirements. To design and enact a Personal Curriculum, a number of parties work together—parents, the student, counselors, teachers, and other student staff—and write an agreement, which describes the credits that will be earned and the measurable goals for students.⁹¹

Reduced school hours

Districts can apply for waivers that reduce the total number of hours students must be in school in order to receive funding. Waiver applicants can seek reductions down to 878.4 hours and 146 days of instruction. Applicants can also seek a four-day school week. Currently, schools are required to provide 1,098 hours of instruction, spread across 175 days. These waivers are granted for specific educational programs—not for entire districts.

Interdisciplinary credits

Because high school credit is based on the mastery of standards, students can potentially earn credit for more than one course through a single assessment. MDE explains: "So for instance, if a student takes a physics class that requires students to also learn important mathematics concepts, students should be able to earn partial or full credit in both subject areas if they demonstrate they have learned the content."⁹²

Local flexibility for instructional delivery, proficiency measurement

The Michigan Merit Curriculum lays out minimum credit requirements for high school graduation. Yet, the awarding of that credit is largely a local decision. Schools and districts retain power to decide whether students are academically proficient.

POLICY LIMITATIONS IN MICHIGAN

In Michigan, perhaps the largest legal hurdle for CBE lies in the funding structure for public schools. The State School Aid Act describes the requirements for schools to receive funding. The act states, among other requirements, that districts must provide at least 1,098 hours of instruction. These hours must be spread across 175 days per academic school year. Unless districts get a school-specific waiver from these requirements, all schools—including those relying on blended and online learning—must meet the 1,098-hour requirement.⁹³

Unless districts get a school-specific waiver from these requirements, all schools—including those relying on blended and online learning—must meet the 1,098-hour requirement.

These requirements, as in other states, guide the academic calendar, framing the progression from one school year to the next. For students, this calendar also largely dictates the pace in which they move through grades.

CBE advocates say that, in a true competency system, learning should be a constant, while time should be flexible. That is, students should progress not upon a fixed academic calendar, but after they demonstrate academic proficiency. The speed at which they advance should be variable, from student to student, advocates say.

According to Kenowa Hills' Mike Burde, this seat-time requirement is the primary state-policy obstacle for competency education.

FEDERAL POLICY LIMITATIONS

CBE advocates say that traditional education limits students, in large part by binding them to inflexible academic calendars. Yet federal education policy is largely predicated on these calendars.

⁹² "Michigan Merit Curriculum High School Graduation Requirements." Michigan Department of Education, August 2014.

⁹³ "5-O-B: Seat Time Waiver." Michigan Department of Education, 2014. http://www.michigan.gov/documents/mde/5-O-B_SeatTimeWaivers_329678_7.pdf.

Students could progress at their own pace, earning credits after mastering content, while funding could be based on school enrollment and minimum offered hours of instruction. This may not require a change to statute.

The federal No Child Left Behind Act focuses on summative tests and annual measures of progress. These annual tests can drive teachers' instruction, since schools' failure to reach adequate yearly progress can come with harsh penalties. NCLB, then, creates an incentive for one-size-fits-all education, based on a traditional academic calendar.⁹⁴

Additionally, federal school-improvement grants rely on annual summative assessment data. Without continuous data, schools can lack timely technical assistance from district and state experts, CBE advocates say.

POLICY SOLUTIONS

Michigan's citizens and governmental leaders have limited control over the shape of federal policy. For this reason, this report will focus on state-level policy changes.

In Michigan, policy changes could take a number of forms, drawing from other states' experiences.

Funding requirements

It should be noted that New Hampshire maintains an instruction-time requirement for school funding. In order to qualify for state funding, elementary schools must offer at least 945 hours of instruction, and middle and high schools must offer at least 990 hours of instruction.⁹⁵ However, for schools to be funded, students do not need to receive this much instruction; the schools simply must offer it.⁹⁶ So long as students arrive on pupil-count days, schools receive per-pupil funding.⁹⁷

In Michigan, public policy could mimic this system. Students could progress at their own pace, earning credits after mastering content, while funding could be based on school enrollment and minimum offered hours of instruction. This may not require a change to statute. The State School Aid Act specifies: "each district shall provide at least 1,098 hours and, beginning in 2010-2011, the required minimum number of days of pupil instruction." Noncompliant districts must forfeit funding in an amount proportional to their noncompliance—as measured by hours of instruction not offered.⁹⁸

⁹⁴ Worthen, Maria, and Lillian Pace. "A K-12 Federal Policy Framework for Competency Education: Building Capacity for Systems Change."

⁹⁵ "Minimum Standards for Public School Approval." New Hampshire State Board of Education, 2014. <http://education.nh.gov/legislation/documents/ed3062014-min-stands.pdf>.

⁹⁶ Bramante, Fred. Email interview, March 5, 2015.

⁹⁷ Freeman, John. Phone interview, March 4, 2015.

⁹⁸ State School Aid Act of 1979, n.d. [http://www.legislature.mi.gov/\(S\(hwb53cydhezaspctc210k-etx1\)\)/mileg.aspx?page=getObject&objectName=mcl-388-1701](http://www.legislature.mi.gov/(S(hwb53cydhezaspctc210k-etx1))/mileg.aspx?page=getObject&objectName=mcl-388-1701).

Yet this does not specify how many hours of instruction students must receive. That appears to be a distinction that MDE draws, which is explained in its Pupil Accounting Manual: “Pupils receiving less than 1,098 hours of pupil instruction during the school year must have their memberships prorated based on the actual number of instructional hours provided.”⁹⁹ It is possible, then, that to mimic New Hampshire, only MDE may need to take action, by amending Michigan’s administrative code, sections R340.1 – 340.18.

Michigan’s policy makers may opt for a different approach. Another proposal, from a Michigan group called the Consensus for Change Think Tank, suggests that the state award FTE status based in part on a student’s completion of credits, measured against a standard requirement for credit completion. In this system, gifted students would potentially move quickly, earning more credits, and thus more funding for the school. Struggling students would potentially move slowly, earning fewer credits and less funding for the school. Ideally the two sets would average out to 1.0 FTE.¹⁰⁰

This proposal, however, raises potential issues for lower-performing schools. It is unclear whether such a system would disadvantage already-struggling schools, potentially adding to the schools’ financial burdens. Unfortunately, the group does not address this issue in its proposal. Additionally, the change would likely require an amendment to state law, not solely the administrative code.

Full-scale implementation vs. local control

With the disentangling of instructional time and school funding, Michigan schools may, from a policy standpoint, be better able to implement CBE. Yet full-blown competency education would still remain a choice for Michigan schools. Funding barriers would be removed, yet districts could still opt for a more traditional form of education.

To advance CBE further, policy makers could once again mimic New Hampshire’s rules. The state’s rules explicitly require all schools to award credit based upon students’ completion of competencies, not time spent in class. (New Hampshire’s rules required this transition for high schools by 2008; newer rules set the same requirements for K-8 grades by 2017.)¹⁰¹ Michigan Merit Curriculum does tie proficiency to credit, but it does not do so on a competency-by-competency basis, as does New Hampshire.

⁹⁹ “Days and Hours of Pupil Instruction.” Michigan Department of Education, 2014. http://mi.gov/documents/mde/Section-2_250846_7.pdf.

¹⁰⁰ “Recommendations for State School Aid Act: Executive Summary.” Consensus for Change Think Tank, September 2012.

¹⁰¹ Freeman, John. Phone interview, March 4, 2015.

Seat time waivers

Michigan policy makers may choose to revisit seat time waivers. Districts must currently apply for these waivers, and even when granted, the waivers for 100 percent online education place caps on the number of participating students. A competency system of education, in theory, would not set these caps.

Legal responsibility for competencies, performance standards

Last, policy makers in Michigan may have to make a challenging decision: whether local districts should be required to develop competencies and performance standards. In Maine, districts must develop competencies and proficiency measures; the state does not dictate these standards. Yet this has led to inconsistent proficiency standards across the state.¹⁰² If CBE were implemented in Michigan, policy makers would likely have to confront this issue, either by developing statewide competencies and performance standards, or by accepting that these standards may differ from district to district.

TIMEFRAME FOR IMPLEMENTATION

The transition to competency education is a years-long process. In New Hampshire, CBE regulations were implemented in 2005. They required high schools to have competency systems of education ready by the 2008-2009 school year. Yet that timeline has proven difficult to meet for many districts. In Pittsfield, the district was not ready to implement CBE until 2011. Many other districts have taken even longer, according to district Superintendent John Freeman.¹⁰³

Maine set a less ambitious timeline. The state legislature passed its CBE law in 2012, requiring schools to make their transition by 2017. Yet that date was delayed because it was contingent upon state funds for technical assistance, a requirement that has set back mandatory implementation until 2018.¹⁰⁴

Regulatory deadlines do not necessarily tell the whole story, though. In New Hampshire, as noted earlier in this report, schools had already begun piloting CBE in the late 1990s. Competency education was already somewhat established by 2005, when the state adopted its far-reaching regulatory changes.

¹⁰² Silvernail, David, et al. "Preliminary Implementation of Maine's Proficiency-Based Diploma Program."

¹⁰³ Freeman, John. Phone interview, March 4, 2015.

¹⁰⁴ Silvernail, David, et al. "Preliminary Implementation of Maine's Proficiency-Based Diploma Program."

Costs Associated with Competency-Based Education

Competency-based education represents a radically new vision for K-12 education. Because it affects so many areas of schooling, it also comes with significant costs. Those costs are administrative and financial in scope.

ADMINISTRATIVE COSTS

A number of schools report that staff are consumed by the transition to CBE. Maine's report says, "Standards-based education was not just one focus area among several; it was *the* focus for a school or district. As such, most administrators talked about the need to direct all core resources and related funding toward implementation."¹⁰⁵

The district has 210 staff; with eight early dismissal days (3 hours each), and five professional development days (6.5 hours each), the district dedicated 11,865 staff hours to this work.

That has certainly been the case in Kenowa Hills, Michigan. Curriculum head Mike Burde said that last year, professional development days and early dismissals focused entirely on the transition to CBE. This work included the development of new rubrics, assessments, and performance standards. The district has 210 staff; with eight early dismissal days (3 hours each), and five professional development days (6.5 hours each), the district dedicated 11,865 staff hours to this work. Burde noted, too, that many teachers continued this work in their free time.

Another difficult-to-quantify cost is the time spent on community outreach. CBE advocates and practitioners agree: community outreach is crucial for successful school reform. Yet this outreach requires a potentially significant investment of staff time.

FINANCIAL COSTS

Of course, the above-mentioned staff hours are a direct expense for schools. Teachers are paid for this time. Yet it is perhaps more a question of time allocation than additional expenses. Schools, however, have also faced significant additional expenses when implementing CBE.

¹⁰⁵ Ibid.

Professional development

In Maine, district leaders believed strongly in the importance of professional learning opportunities, focused specifically on CBE. To offer these opportunities, one district contracted the Re-Inventing Schools Coalition, a division of Marzano Research. The trainings cost \$55,000. The district paid \$15,000, and the state's education department paid the remaining \$40,000. Other schools contracted school coaches, at an approximate cost of \$50,000 each year. Additionally, when teachers visited off-site trainings, schools needed to cover travel costs and the costs of substitute teachers.

Technology

Schools face costs from technological investments, too. Empower, the learning management system and student information system, charges \$5 per student per year for large districts, and \$10 per student per year for small districts. For large-scale implementation, though, smaller districts can benefit from the lower rate. In Maine, for example, some 50 districts receive Empower for the \$5 rate. Empower, as noted above in "Technology and Student Information Systems," is not a complete solution for some schools. Many schools use the program in tandem with a traditional SIS, such as PowerSchool, in order to keep track of scores from statewide tests, in addition to other student data.

The school district in Chugach, Alaska, developed its own system by contracting developers in India. The current superintendent, Robert Crumley, was not in his position at the time, but he estimates that the initial cost was more than \$1 million, which was covered by a grant. Ongoing maintenance and development currently costs about \$4,000 each month, he added.

Extended learning for students

For struggling or slow-moving students, self-paced learning can create potentially large expenses for districts. Schools are generally funded with the assumption that students will receive 13 years of education.¹⁰⁶ If students graduate after 15 years, though, districts will be left to cover the increased costs. Additionally, with "anywhere, anytime" learning, districts may see an increased need for summer school, at a cost that could be significant.

Possible litigation

Maine's report raises a concern about increased litigation. If non-disabled students fail to meet standards, their families may initiate due-process hearings, seeking compensatory education services. And if children age out and don't receive a diploma, families may file legal claims, saying that children were improperly served. These are of course hypothetical scenarios, but because of their potential costs, they are worth considering.

¹⁰⁶ Silvernail, David, Erika Stump, Anita Stewart McCafferty, and Kathryn Hawes. "Implementation of a Proficiency-Based Diploma System in Maine: Phase II - District Level Analysis." Maine Education Policy Research Institute, January 2014. <http://usm.maine.edu/sites/default/files/cepare/PBDSMEPRJan14Web.pdf>.

Limits in Research and Data

An increasing number of educators and policy makers have grown interested in competency-based education. Despite this widespread interest, though, there is currently no empirical, academic research on its effectiveness in K-12 school systems.

The lack of research stems from CBE's diversity, according to Rose Colby, the New Hampshire-based CBE expert. Colby points out that no two schools may implement CBE the same way. Performance standards vary, reporting systems vary, and assessments vary. With such a diverse pool of data, researchers cannot meaningfully compare the effectiveness of K-12 CBE, she said.

Colby advocates a different way of thinking about competency education—by considering the problems with traditional education. “Does current data demonstrate that kids are college and career ready? If the answer is no, as I believe it is, what *shouldn't* we be doing?” she said. Colby argues that the current K-12 education system is broken. Because of that, the system needs to be redesigned, using what she says are proven educational tools, such as personalized learning plans.

This is a recurring argument among CBE advocates—that our current education system is broken, badly enough to justify replacing it with another system, even if the replacement is not supported by robust research. Yet if that represents one of the core arguments in favor of CBE, it's worth raising a question about the premise: Is our current education system really so broken?

The dropout crisis and graduation rates

Reform advocates cite what they say is a dropout crisis among America's high school students. This crisis, they say, is one of many reasons to overhaul current K-12 education.

Yet statistics from the federal Department of Education paint a more mixed picture. From 1990 to 2013, both white and black students had an increase in their rates of high school graduation. For 25- to 29-year-old whites, the number of students with a diploma or its equivalent rose from 90 to 94 percent, while that figure rose from 82 to 90 percent for blacks.¹⁰⁷

¹⁰⁷ Kena, Grace et al. “The Condition of Education 2014.” U.S. Department of Education National Center for Education Statistics, May 2014. <http://nces.ed.gov/pubs2014/2014083.pdf>.

At the same time, the percentage of school-age children living in poverty was higher in 2012 (21 percent) than it was in 1990 (17 percent). This is potentially significant for two reasons. First, academic researchers have shown that poverty puts students at a greater risk of low academic achievement.¹⁰⁸ Yet, from 1990 to 2013, as an increasing number of students lived in poverty, their rates of educational attainment still rose.

Through these years, dropouts decreased, too. The Department of Education describes dropouts in terms of “status dropout.” The status dropout rate is the percentage of 16- to 24-year-olds who have not earned a high school diploma or GED, and who are not enrolled in school. In 1990, the status dropout rate was 12 percent. In 2012, it was 7 percent.

Educators rightfully debate what level, if any, of dropouts is acceptable. Still, to describe high school dropouts in terms of “crisis” perhaps masks the truth—high school students, and particularly black students, have made steady, significant gains in educational attainment over the last 25 years.

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Achievement gaps

Reform advocates also argue that K-12 education is failing students at risk of educational failure, thereby perpetuating the gaps in achievement between students of different ethnicities and socioeconomic backgrounds. Again, though, federal data paints a more complex picture of this issue.

According to the Department of Education, from 1990 to 2013, black students and Hispanic students made larger gains in high school education attainment than whites. While whites still gained a higher percentage of high school diplomas, the gap with black students shrank from 8 percentage points to 4, and the gap with Hispanic students shrank from 32 percentage points to 18.¹⁰⁹

¹⁰⁸ Engle, Patrice L., and Maureen M. Black. “The Effect of Poverty on Child Development and Educational Outcomes.” *Annals of the New York Academy of Sciences*.

¹⁰⁹ Kena, Grace, et al. “The Condition of Education 2014.”

Trends on the National Assessment of Educational Progress (NAEP) showed these gaps narrowing, too. As the Department of Education explains:

"In reading, the White-Black and White-Hispanic reading gaps narrowed from the 1970s to 2012 at ages 9, 13, and 17, even though the average reading score of White students remained 21 or more points higher than the average scores for Black and Hispanic students in 2012.... From 1971 to 2012, White 13-year-olds had a 9-point gain, and Black 13-year-olds had a 24-point gain. Larger gains for Black than for White 13-year-olds during the period narrowed the White-Black gap from 39 points in 1971 to 23 points in 2012. Similarly, Hispanic students age 13 had a 17-point gain in reading from 1975 to 2012, which narrowed the White-Hispanic gap from 30 points in 1975 to 21 points in 2012."

These gains were not limited to reading. On the NAEP's math portion, these gaps narrowed, too:

"average mathematics scores for 17-year-olds increased 4 points for White students, 18 points for Black students, and 17 points for Hispanic students from 1973 to 2012.... For 17-year-old students, the White-Black score gap narrowed from 40 points in 1973 to 26 points in 2012, and the White-Hispanic score gap narrowed from 33 to 19 points over the same period."

To be sure, there still remain testing gaps between students of different ethnicities. And, as the DOE notes, while higher-education attainment rose for both blacks and Hispanics from 1990 to 2013, whites' attainment rose at a higher rate, exacerbating the gap in post-secondary attainment. Whites' attainment of a bachelor's or higher rose from 26 to 40 percent, while for blacks attainment rose from 13 to 20 percent. Hispanics' rate rose from 8 to 16 percent.

Flat test scores

Some reform advocates argue that overall student achievement has remained paltry for years. Yet, at least on the NAEP, students have made slow but mostly steady progress. Among 8th graders in 1992, only 3 percent of students tested as "advanced" in math. That number rose to 8 percent in 2011. Among fourth graders, 29 percent were measured as "proficient" in reading in 1992, while that number rose to 34 percent in 2011.

Although some take issue with that rate of proficiency, a proficiency score is akin to an A grade, whereas "basic" is a stand-in for a B or C grade.¹¹⁰

¹¹⁰ Ravitch, Diane. "What Do NAEP Scores Mean?" *Diane Ravitch's Blog*. Accessed March 5, 2015. <http://dianeravitch.net/2012/05/14/what-do-naep-scores-mean/>.

Overall, scores have risen for every grade level, for both reading and math, since the 1970s. Between 1971 and 2012, average reading scores rose from 208 to 221 for nine year olds; 255 to 263 for 13 year olds; but only from 285 to 287 for 17 year olds. Average math scores rose from 219 to 244 for nine year olds; 266 to 285 for 13 year olds; though only from 304 to 306 for 17 year olds.¹¹¹

Again, while educators and policy makers must decide what constitutes an attainable, desired level of NAEP achievement, to depict NAEP scores as unchanged since the 1970s does not represent students' overall gains.

Potential vendor bias

One last point should be raised about CBE's limited research base. CompetencyWorks is perhaps the most influential thought leader working on CBE. The group has released a number of detailed briefs about CBE, covering everything from federal policy to grading systems. The group also maintains a wiki with a wealth of information about competency education. Its detailed definition of competency education forms the foundation of Iowa's own principles, and between its blogs and publications, CompetencyWorks offers perhaps the richest source of information about the topic.

With online education and e-data tools such major features of CBE advocacy, educators and policy makers may wish to remain cautious.

Yet CompetencyWorks is a subsidiary of the International Association for K-12 Online Learning, or iNACOL. This raises questions about potential conflicts of interest. The mission of iNACOL, according to its website, is "to ensure all students have access to a world-class education and quality blended and online learning opportunities that prepare them for a lifetime of success." The group's services include, among others, consulting support for blended and online learning programs. iNACOL has a clear interest—and a stated mission—to promote online education.

With online education and e-data tools such major features of CBE advocacy, educators and policy makers may wish to remain cautious while reviewing the available literature from CompetencyWorks and its affiliated groups.

¹¹¹ "NAEP 2012: Trends in Academic Progress." Department of Education National Center for Education Statistics, 2012. <http://nces.ed.gov/nationsreportcard/subject/publications/main2012/pdf/2013456.pdf>.

Conclusion

Competency-based education offers a drastically new vision for K-12 education. Traditional education places students in age-based cohorts, where they move through courses at predetermined paces. In competency education, students learn at their own pace. They progress only after they have mastered discrete competencies. Ideally, this prevents gaps in learning from accumulating across courses or academic years.

Competency education also calls for flexible, multiple means of assessment—and learning. In New Hampshire, where schools are implementing CBE, students may earn credit through online courses, internships, and other nontraditional educational opportunities. So long as they can demonstrate mastery of standards, students can earn credit.

This flexibility, advocates believe, can have far-reaching effects. By focusing on competencies instead of letter grades, students will have a clearer understanding of their achievement, advocates say. So will colleges and employers—not to mention teachers and other school staff, who can tailor teaching to each student's needs and interests. Additionally, CBE's student-centered approach will increase students' motivation, advocates say, while making for a more rich and relevant learning experience. Competency education, advocates say, is the best option to ensure that all students graduate from high school, prepared for college and adult life.

Competency education is still very new to K-12 education. Because of its newness, and because schools implement it in different ways, there is currently no large-scale academic evidence of its effectiveness. Looking at a smaller scale, however, reveals that some schools have begun to see evidence of its benefits. In Maine, school staff have reported evidence of increased student engagement. Additionally, school leaders say that student attendance has increased since implementing CBE, alongside reductions in negative classroom behaviors.

In Pittsfield, New Hampshire, District Superintendent John Freeman said that while he cannot tie any specific changes in achievement to CBE, the district's dropout rate has fallen to 1 percent. Test scores have improved, and the district is no longer on the state's priority list, he added.

CBE offers a potential boon for K-12 education. Yet the transition to a competency-based system comes both with high costs and uncertainties. In Maine, where implementation is under way, teachers say that the new education system has forced them to focus heavily on logistics, rather than on improving their teaching. The transition from traditional education to competency-based education can be all consuming for schools. This is particularly true for the development of new materials, such as competencies, performance standards, curricula, and rubrics. With the need to invest in professional development and new technology, CBE can require significant financial investments, too.

Though CBE advocates say competency education can help close achievement gaps, many schools have found that low performers struggle even worse in a self-directed system. Intrinsic motivation is difficult to cultivate, and when students are allowed to move at their own pace, struggling students often fall behind. Schools that implement CBE will need to continue to address this issue. As schools move closer toward an ideal form of CBE, with no letter grades and with flexible academic calendars, they will also need to address the limitations posed by federal educational requirements, which call for grade-based end-of-year examinations.

Some education groups warn about the impacts of far-reaching reform, particularly when the effects of proposed reforms are relatively unstudied. The Carnegie Foundation for the Advancement of Teaching, in a report reviewing the Carnegie Unit, summed up these concerns: “It is one thing to have good ideas for change; it is another to execute effectively and efficiently in our large, complex educational systems.... We need to accumulate evidence that new educational models aiming for greater flexibility and transparency actually enhance educational opportunities and moderate costs, under what conditions, and for which students—ensuring that we safeguard students along the way.”¹¹²

The issue of costs is particularly pertinent for Michigan. In the 2013-2014 fiscal year, 57 school districts and public academies ran budget deficits.¹¹³ Given the high upfront costs associated with competency education, policy makers and educators will have to make potentially difficult choices about the allocation of resources, if they decide to pursue competency-based education.

This report provided an overview of competency-based education, addressing both theoretical topics and CBE's nuts-and-bolts implementation. Despite this report's breadth, though, competency education touches on many other areas of K-12 education, including specific classroom practices. Michigan's educators and policy makers may wish to study these areas as they continue to consider competency-based education.

“It is one thing to have good ideas for change; it is another to execute effectively and efficiently in our large, complex educational systems.”

¹¹² Silva, Elena, et al. “The Carnegie Unit.”

¹¹³ Flanagan, Mike. “Quarterly Report to the Legislature on Deficit Districts,” December 19, 2014. Quarterly Report to the Legislature on Deficit Districts.