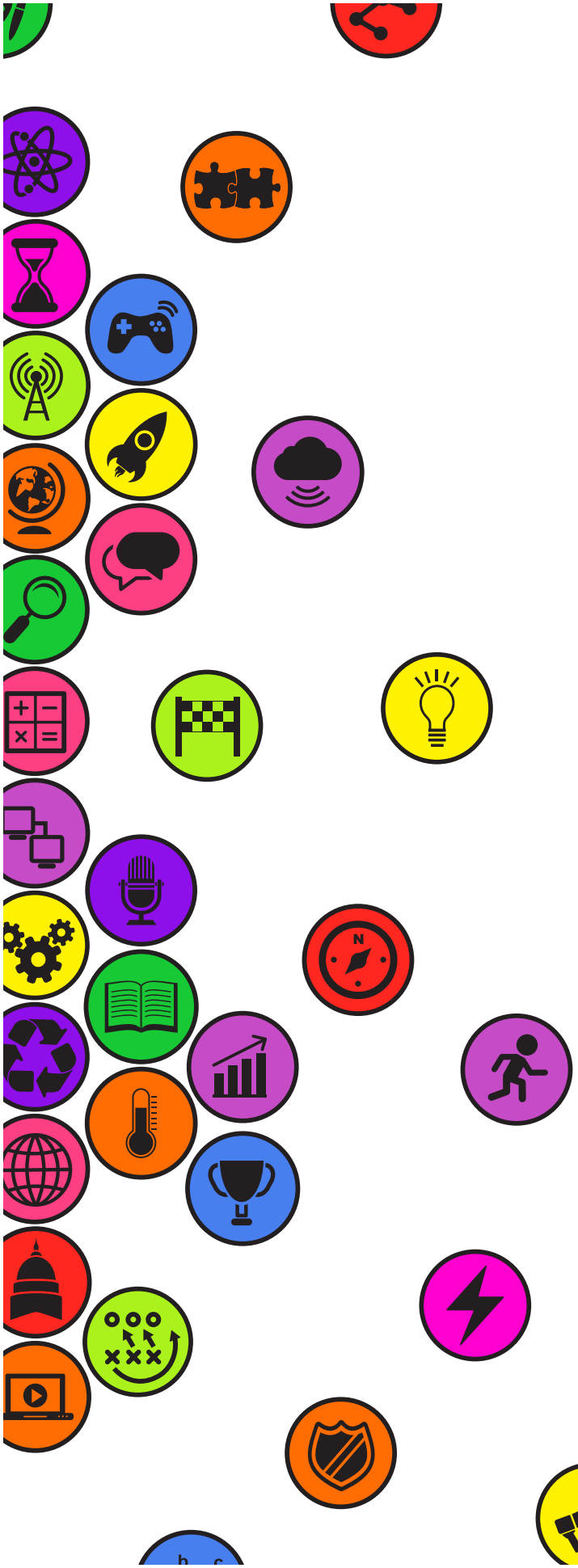

PREPARING TEACHERS FOR DEEPER LEARNING

Competency-Based Teacher Preparation and Development

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Executive Summary

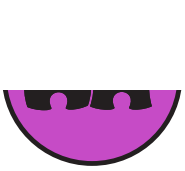
Schools and districts across the country are redefining the goals of K-12 education and reimagining the very nature of teaching and learning, spurred by the implementation of college- and career-ready standards and the promise of a new generation of online assessments. This collective "re-imagination" is represented by a range of evidence—from the individual teacher who discovers a new app that will make learning more engaging and meaningful for her students to the formal acknowledgment by the U.S. Department of Education's National Education Technology Plan's renewed focus on the promise of personalized learning.

"Preparing Teachers for Deeper Learning" explores the key questions:

If, then, the goals of American education are being redefined, and the opportunities are expanded with the advent of technology, the Internet and digital content, how must the role of the educator evolve? And, how must teacher preparation and ongoing professional development evolve to fully enable teacher success in this new environment?

Through an exploration of these central questions, the authors assert:

If we truly are to harness the power that technology brings and seize the moment wrought by new college- and career-ready standards supported by aligned assessments, we must reexamine the processes and methods used to prepare teachers, accredit institutions doing the preparing, and support continuous development of teacher competency throughout their professional careers.



As calls for improving achievement and increasing personalization of student learning echo across the national discourse, new adult learning models are creating the potential for personalized preparation and development pathways for teachers. As student roles change in a personalized learning environment, teacher preparation and professional learning should evolve accordingly in order to offer teacher control over time, place, path and/or pace; balanced goals; meaningful integration and competency-based progression.

Just as K-12 blended learning models offer students opportunities to learn in both in-person and online environments, blended teacher preparation and development could combine online learning with onsite experiences. New pathways could be part of a formal degree program or an alternative program, specific to a group of schools or particular models.

In the same way that student assessment is evolving to prioritize demonstrations of mastery over basic proficiency, competency-based teacher development would enable pre-service and practicing teachers to demonstrate knowledge and skills at regular intervals.

Micro-credentialing, or badging, is a competency recognition system aligned with a series of gates or milestones recognized by a community. Recent research and development efforts have focused on the use of digital badges or tokens to signify accomplishment and to measure and reward competency-based outcomes. A series of micro-credentials could be used to mark initial preparation as well as recognize and reward ongoing development and leadership in myriad aspects of the education profession.

These competency-based pathways can achieve Deeper Learning learner outcomes, promoting active inquiry, critical thinking and collaborative problem solving, as well as content mastery. As a recent report illustrates, there are different approaches to promoting Deeper Learning and college- and career-readiness; school models and instructional strategies that promote Deeper Learning competencies require unique and varied teacher knowledge and skills that are often underdeveloped in traditional teacher preparation.[1]

This paper outlines the attributes of next-generation teacher preparation and makes recommendations to support the development of teacher preparation and development systems that will equip teachers to thrive in learning environments that develop Deeper Learning competencies.

The paper begins with an introduction that situates the changing roles of teachers inside the broader shifts to personalized, blended, Deeper Learning for students. After summarizing the current state of teacher preparation, professional development and accreditation, the authors describe a new approach to high-quality teacher preparation and ongoing professional learning opportunities that would offer:

- some element of teacher control over time, place, path and/or pace;
- balance between teacher-defined goals, goals as defined by administration through teacher evaluation efforts, and school and district educational goals;
- job-embedded and meaningful integration into classroom practice; and
- competency-based progression.

Drawing on examples from outside of the field of education as well as innovators in higher education and K-12, the next section builds the case for competency-based teacher education. This section defines the elements of a competency-based system and describes micro-credentialing in the context of teacher development.

The authors conclude with recommendations that will move the field toward a competency-based system and a call to action regarding the importance of better aligning teacher preparation and development with student Deeper Learning goals.

Introduction

> **"Personalized learning means instruction is paced to learning needs, tailored to learning preferences, and supported by the specific interests of different learners."**
>
> National Education Technology Plan: Learning Powered by Technology

The Shift to Personalized, Deeper Learning

Across the country, schools and districts are seizing the opportunity to reimagine the very nature of teaching and learning, spurred by the implementation of college- and career-ready standards and the promise of a new generation of online assessments.

This trend is playing out in classrooms across the country and in the national education policy discourse—from individual teacher experimentation with new ways to support learning to the U.S. Department of Education's National Education Technology Plan's focus on personalized learning.

Although time-consuming, individualized and personalized instruction has been used by good teachers for decades to better address each student's needs. Now, with the ubiquity of more powerful and affordable devices and an increasingly vast set of online and digital resources, it is possible to customize learning at scale.

The opportunity set afforded by higher standards and more comprehensive student assessments has led to calls from organizations like the William and Flora Hewlett Foundation to support the new goals of American education, specifically those goals that call for Deeper Learning. The Hewlett Foundation

Beyond Differentiation and Individualized Instruction. *Barbara Bray and Kathleen McClaskey's work on Personalize Learning breaks down the differences between personalization, differentiation and individualization—noting that only personalized learning shifts the focus from teachers to learners (see Appendix A).*[2] *In an individualized environment, the teacher adapts instruction to accommodate the learning needs of the individual. In a differentiated learning environment, the teacher designs instruction based on the learning needs of different groups of learners. In a personalized learning environment, learners take responsibility and have ownership of their learning.*

explains, "Deeper Learning is an umbrella term for the skills and knowledge that students must possess to succeed in 21st century jobs and civic life. At its heart is a set of competencies students must master in order to develop a keen understanding of academic content and apply their knowledge to problems in the classroom and on the job."[3] The Hewlett Foundation's Deeper Learning framework identifies six interconnected competencies that are essential components of 21st century college- and career-readiness:[4]

- Master core academic content
- Think critically and solve complex problems
- Work collaboratively
- Communicate effectively
- Learn how to learn
- Develop academic mindsets

If, then, the goals of American education are being redefined, and the opportunities are expanded with the advent of technology, the Internet and digital content, how must the role of the educator evolve? And, how must teacher preparation and ongoing professional development evolve to fully enable teacher success in this new environment?

The National Education Association's (NEA) Policy Statement on Digital Learning speaks to these questions:

> *"NEA believes that the increasing use of technology in the classroom will transform the role of educators allowing the educational process to become ever more student centered. This latest transformation is not novel, but part of the continuing evolution of our education system. Educators, as professionals working in the best interests of their students, will continue to adjust and adapt their instructional practice and use of digital technology/tools to meet the needs and enhance the learning of their students."*

The NEA's sentiment is echoed in a recent paper from Digital Learning Now, Getting Smart and Public Impact. Improving Conditions & Careers: How Blended Learning Can Improve the Teaching Profession explains how the shift to online and blended learning can benefit both teachers and students since "each group benefits from the ability to personalize learning, increase student engagement, access better student data, customize content, support diverse learning modalities and vary delivery methods."[5]

The Clayton Christensen Institute defines blended learning as a system of education in which students learn:

- *at least in part through online learning, with some element of student control over time, place, path and/or pace;*
- *at least in part in a supervised "brick-and-mortar" location away from home;*
- *using modalities along each student's learning path within a course or subject that are connected to provide an integrated learning experience.*[7]

Teaching is a field in which job satisfaction is at its lowest rate in decades, although new inspired and "powered-up" learning environments may reverse this trend. In "Improving Teacher Conditions and Careers the authors explain, "The shift to personalized, blended learning will yield extended time with students, more team-teaching and collaboration, new options to teach at home, a greater focus on deeper learning, individualized professional development plans, better student data to inform instruction, and more earning power."[6]

If we truly are to harness the power that technology brings and seize the moment wrought by new college- and career-ready standards supported by aligned assessments, we must reexamine the processes and methods used to prepare teachers, accredit institutions doing the preparing, and support continuous development of teacher competency throughout their careers.

The Current State of Teacher Preparation

There was a big but generally unrecognized preparation problem 10 years ago when Art Levine began researching his groundbreaking report, *Educating School Teachers.*[8] The problem has grown exponentially worse with advances in technology, the development of new school models, diversifying student populations and the shift to new college- and career-ready standards and the next generation of assessments.

Even a modest investment of time in tracking the current trends in education will yield evidence that student roles in the classroom are evolving. Armed with new tools and empowered by new standards, students are gaining access to new, increasingly online and blended learning opportunities that have the potential to enable the development of Deeper Learning competencies. But in order to enable these environments fully, prospective teachers must also learn within this new context. As they prepare to enter the classroom, they also can benefit from the same type of personalized, blended learning opportunities. On the whole, however, teacher preparation in this country currently remains constrained, inflexible and disconnected from shifts in the classroom as well as from emerging opportunities to support learning.

As Thomas Arnett of the Clayton Christensen Institute explains, "Emerging personalized learning models are transforming the role of the teacher. Teachers in these models find themselves acting more as coach and mentor than as deliverers of direct instruction. As such, the skills they need to successfully fulfill their jobs are shifting, but many of the programs that train them remain static."[9]

Many would argue that generally speaking, teachers are not graduating from colleges of education with the skills and competencies needed to be successful in the outdated factory model of education that still plagues many classrooms, let alone prepared to thrive in the new teacher roles necessitated by shifts to student-centered, personalized Deeper Learning. Many teachers and students do not yet have the knowledge and skills to apply technology to learning in completely new and meaningful ways.[10] Teachers who work inside schools that personalize and inspire learning challenge students with real world problems, and are supported with the technology tools for creating, publishing, researching, thinking and composing must be adept at orchestrating learning.[11] As new models of teaching and learning emerge, such as those profiled in Deeper Learning For Every Student Every Day, the notion of credentialing teachers based solely on grade bands and content areas will become increasingly obsolete. With the growth of purpose-built schools and networks, we believe teachers will be better served by a series of credentials that measure proficiency of the unique and discrete skills necessary to be successful in each model using specific toolsets. This certainly necessitates a new approach to preparing and developing teachers, specifically by engaging them as learners in just this type of learning environment.

Recognizing both the shift to personalized, blended learning and the problems with current teacher preparation, the work of the Council of Chief State School Officers (CCSSO) through the Interstate Teacher Assessment and Support Consortium (inTASC) created the Model Core Teaching Standards and Learning Progressions for Teachers 1.0. This "common core for teachers" describes "the principles and foundations of teaching practice that cut across all subject areas and grade levels and that all teachers share."[12] The standards were designed specifically to "articulate what effective teaching and learning looks like in a transformed public education system—one that empowers every learner to take ownership of their learning, that emphasizes the learning of content and application of knowledge and skill to real world problems, that values the differences each learner brings to the learning experience, and that leverages rapidly changing learning environments by recognizing the possibilities they bring to maximize learning and engage learners."[13]

The Current State of Professional Development

With the emerging implementation of dynamic educational initiatives, it is essential that teachers have access to high-quality, ongoing professional learning as their role and methods change. Professional development (PD) has filled this role, but the system of PD as it currently exists is unsatisfactory to many,[15] including Harvard University professor Heather C. Hill, who writes, "The professional development 'system' for teachers is, by all accounts, broken."[16] Opportunities for PD tend to be "short-term, episodic, and disconnected" from teachers' in-class practice;[17] they are often heavy on front-loaded content but fail to support teachers in the implementation stage and focus on generic techniques of little use to most teachers. A landmark study by the National Staff Development Council found that over 90 percent of teachers reported having participated in professional development in the past year however, only 59 percent of teachers found content-related PD useful, and fewer than half found PD useful in other areas such as technology use, reading instruction, special education and classroom management.[18]

The Center for Public Education reports that effective professional development must allow time for teachers to learn a new strategy and grapple with the implementation problem by addressing the specific challenges of changing classroom practice.[19] A recent report reviewed studies on PD and found that teachers who receive at least 14 hours of professional development demonstrated "a positive and significant effect on student achievement from professional development" and that "teachers who receive substantial professional development—an average of 49 hours in the nine studies [reviewed by this report]—can boost their students' achievement by about 21 percentile points."[20]

Progress in Teacher Prep. *To date, seven states have adopted policies for using edTPA—a partnership between Stanford University's Stanford Center for Assessment, Learning and Equity (SCALE) and the American Association of Colleges for Teacher Education (AACTE) that creates a multiple-measure assessment system aligned to state and national standards including Common Core State Standards (CCSS) and the Interstate Teachers Assessment and Support Consortium (InTASC).*[14] *With regard to universities, pioneers include two Idaho universities with Albertson Foundation grants to pursue blended and competency-based approaches to preparation. The Albertson Foundation grants will establish Doceõ Centers for Innovation + Learning at University of Idaho and Northwest Nazarene University. Other examples include New York City's innovative new Relay Graduate School of Education that intends to be an early adopter of micro-credentialing in teacher training by piloting badges in its clinically focused, competency-based program, as well as competency-based Western Governors University that prepares the largest number of STEM teachers in the country.*

But teachers need more than just a total number of PD hours—they need well-designed development opportunities that include opportunities to practice what they learn. Teachers require "an average of 20 separate instances of practice … to master a new skill."[21] The right balance of information and practice is important, and like any learning, it is in the application of new knowledge that learning really occurs.

Research shows that modeling is "a highly effective way to introduce a new concept and help teachers understand a new practice."[22] The use of video and annotation support not only modeling and observation of master teacher practice, but also mentoring. PD should include evaluating teachers on their implementation, including "insightful feedback about teacher performance that leads to a strategic set of professional-learning activities to help educators improve their practice."[23]

Teaching is complex. It should be no surprise that teaching teachers is also complex, and getting it right is absolutely essential. As Jenny DeMonte of the Center for American Progress explains, "In many ways professional development is the link between the design and implementation of education reforms and the ultimate success of reform efforts in schools."[24]

The Current State of Accreditation

In all but five states, accreditation of teachers' colleges in the United States is voluntary.[25] Some argue that the current college accreditation system stifles innovation, places undue burdens on institutions' time and money, and drives up the price of college tuition. A Heritage Foundation report concludes that, while some form of accreditation is necessary to protect consumers (i.e., students) from low-quality providers, the current system is a "barrier to entry in a market, enabling existing providers to use licensing to thwart competition."[26] The report suggests accreditation should favor "knowledge and skill acquisition over seat time" and that including options for online learning will enable students to customize their learning as they study to become teachers—at the same time that many K-12 schools move toward blended learning.[27]

Shawn Daley, Assistant Professor and Director of Academic Technology at Concordia University describes the shifts he is witnessing in higher education. He explains,

"My colleagues at Pacific University have started a new center on technology and educational innovation while my good friend at George Fox University leads her undergraduate cohorts through the pedagogy of mobile integration. At Concordia University, we have been incorporating iPads into our pedagogy for the past two years, and in the months ahead, will integrate Google Glass, 3-D printing, robotics, and games-based learning."

A New Approach

Simply stated, teachers should have access to the personalized, competency-based learning opportunities that are increasingly being acknowledged as essential to student success. Just as the Christensen Institute advocates for blended learning in which a student has some control over time, place, and pace along a unique learning path that leverages technology to create an integrated and connected learning experience,[28] we believe these same principles can and should be applied to learning for teachers.

High-quality teacher preparation and ongoing professional learning opportunities should offer:

- some element of teacher control over time, place, path and/or pace;
- balance between teacher-defined goals, goals as defined by administration through teacher evaluation efforts, and school and district educational goals;
- job-embedded and meaningful integration into classroom practice;
- and competency-based progression.

The focus of the remainder of this report is to build out these design principles for teacher preparation and professional learning and to build a vision for a system of teacher training that prepares educators to thrive in environments supportive of Deeper Learning.

DESIGN PRINCIPLES FOR NEXT-GEN TEACHER PREPARATION & PROFESSIONAL DEVELOPMENT:

Echoing the calls for more personalized, deeper learning opportunities for students, high-quality teacher preparation and ongoing professional learning opportunities should offer:

- some element of teacher control over time, place, path and/or pace;
- balance between teacher-defined goals, goals as defined by administration through teacher evaluation efforts, and school and district educational goals;
- job-embedded and meaningful integration into classroom practice;
- and competency-based progression.

Opportunities in Adult Learning

The new vision for teacher preparation and professional learning can be informed by best practices both outside of the field of education and in other higher education disciplines, as well as among current innovators in teacher preparation and development.

Lessons from Outside of Education

Adult learning often aims at career advancement and is motivated by intrinsic value. Because adults know more about what they need than to learn and have higher constraints on time and money, adult learning is often geared towards adaptability, productivity and value. Just as schools and districts navigate paradigm shifts to blended, personalized, flexible and competency-based learning for students, teachers can now also benefit from this evolution. There is inspiration to be found outside of teacher training in other fields where adult learning takes place. For example, a survey of 100 leading companies indicates that 86 percent are already using blended learning strategies that combine an average of 4.8 different modalities.[30]

Where the results of learning have high stakes, such as life and death or market competitiveness, the ability to transfer knowledge and techniques must be precise. The U.S. military, for example, builds training and development programs that work because it relies on successful training to keep people out of harm's way. A trip to the exhibit hall of The Interservice/Industry Training, Simulation and Education Conference (I/ITSEC) provides a snapshot of the future of job training. This organization's mission is to promote cooperation among the Armed Services, Industry, Academia and various Government agencies in pursuit of improved training and education programs. It is the ultimate in competency-based, real world, accountability driven education.

"To paraphrase a well-known proverb, if you teach me the relevant skills and knowledge of my time, I will have a job today. If you instill in me imagination, drive and the ability to adapt to a future I cannot anticipate, I will have relevant jobs for a lifetime."[29]

A review of both military training and corporate development yields five complementary observations:[31]

- If desired competencies can be clearly identified, it is possible to build learning experiences and assessment systems to develop and certify them;
- If improvement incentives exist for the system and participants, both will invest in seeking the most efficient path to mastery;
- Local administrators should finalize certification based on observed job performance;
- Initial training is based on sector needs as well as personal interest;
- Innovation diffusion occurs within well-managed organizations and/or healthy markets.

Job preparation and training is undergoing a transformation. In a growing number of professional categories, it is easier, faster and cheaper to learn job skills outside traditional degree programs. A classic example is the need for a company or institution to be multi-lingual as it grows and operates outside the boundaries of its home country. The learning revolution is about "people taking learning into their own hands," said Markus Witte, co-founder of language learning platform Babbel. The "new trend is initiated by a whole new breed of learning technology start-ups that set out to make learning easier for everybody," says Witte. He adds, "This revolution is taking place in living rooms and cafés, on public transport and in offices. It is carried out by people who decide to take their learning into their own hands—and they are finding ever more and better technology-based products to help them."[32]

Formal education typically involves a prescribed place, time and path, but the current personal learning revolution is driven by curiosity, passion and need. Combining interest-based learning and competency-based learning—what one wants to learn and what one needs to learn—may be the learning design opportunity of our time. Skillshare, a global community teaching real-world skills, claims that "the world's most abundant resources are excess knowledge and skills. They just need to be shared and made accessible to everyone."[33] Along those lines, they also attempt to empower the natural tendency towards teaching most people have: "[We] all have things we're passionate about sharing with the world. If you've done something for even a few days more than someone else, you have valuable knowledge to share." These easily accessible repositories for skills and knowledge have an "anyone can teach" philosophy with platforms that teach photography, music, world languages, coding, business, social media and more.[34]

Open access is a huge part of the current influence online learning is having with adults, and most of the new personal learning sites are free or inexpensive. More than 6.5 million learners have accessed over 600 Coursera courses and Khan Academy reaches about 10 million students per month. Both Coursera and Khan Academy provide multiple opportunities to learn and offer frequent

A recent presentation at the SxSWedu conference featuring Bror Saxberg (Kaplan, Inc.), Jeff Carter (Digital Promise), Alex Chisholm (Skylab Learning) and Matthew Munch (The Joyce Foundation) explored the potential of technology to improve adult education. Three key themes emerged from the session: 1) Digital learning tools should be developed using research; 2) Digital learning tools should make learning engaging and relevant; 3) Digital learning tools should ease fears of failure.

Professional Badges across Numerous Fields. *Pearson recently announced a new platform called Acclaim that will "work with academic institutions and high-stakes credentialing organizations to offer diplomas, certificates and other professional credentials as Open Badges" that will complement "a paper-based representation of a credential by providing proof of an earner's achievement in a web-enabled format that can be validated quickly and easily."*[35]

feedback and opportunities to demonstrate learning, mostly through the use of vast video libraries that enable content learning. Some providers, responding to the feedback given in Massive Open Online Courses (MOOCs), are pushing for more active learning models. Udacity, the MOOC-turned-corporate-trainer, encourages students to "advance your education and career through project-based online classes."

While much of the world's knowledge is freely available and anyone with a broadband connection can learn almost anything, we continue to observe that much learning is social—an online or face-to-face connection with a teacher and other learners. A University of Pennsylvania Graduate School of Education study released at the end of 2013 found that, on average, only about half of those who registered for a course ever viewed a lecture, and only about four percent ever finished a course entirely.[36] The findings of the study have pushed online content generators deeper into active learning with a greater understanding of one simple fact—peer groups can improve motivation and understanding.

Specialization is another opportunity in adult learning, with the need for adult learning to be specific to the needs of available employment as well as entrepreneurs. General Assembly offers courses in business, design and technology, and they fetch a premium over other providers because the instructors are highly skilled practitioners, the topics are extremely relevant and the cohorts are talented entrepreneurs. Most companies have already blended the delivery of their training and development, but many are beginning to leverage these new tools. Udemy for Organizations is leveraging a library of 12,000 courses combined with the ability to create custom content to empower companies of any size to easily create private online learning communities. The landscape of online, adult-empowered learning is changing on a daily basis, being pushed forward with the competitiveness of an agile marketplace ready to provide the types of learning adults need, and for which they are ready.

Higher Education Innovators

The Carnegie unit, or credit hour, has been the benchmark to measure student participation in higher education since the late 19th century, when it was introduced to standardize the measurement of student achievement. The proliferation and access to post-secondary education, along with the inescapable connection between degrees and occupations, is leading to the strict measure of seat time as being unrepresentative of a competent, career-ready graduate in the modern economy. "Through its everyday actions, the higher education system itself routinely rejects the idea that credit hours are a reliable measure of how much students have learned," said Amy Laitinen in the New America report, "Cracking the Credit Hour."[37] She notes that many colleges do not accept transfer credits and that a loose connection exists between credits and student learning. The report recommends externally validated learning outcomes and transparent learning outcomes (e.g., learning goals and graded student work should be available for review).

Overall, the academic landscape is changing with new ways to earn credits by demonstrating competence. One such example of this shift is Excelsior College. Founded in 1971 as The Regents External Degree Program with major grants from the Ford Foundation and the Carnegie Corporation, the college motto is, "What you know is more important than where or how you learned it." Excelsior serves more than 36,000 students enrolled in a wide variety of undergraduate and graduate degree programs, and for forty years it has been "the only real option for adults interested in obtaining degrees based on defined, objectively measured learning outcomes instead of defined amounts of time." Competency-based learning is on the rise, and many other higher education programs are seeing its value. For example, Western Governors University (WGU) is a competency-based system that uses exams to grant credits, similar in more respects to becoming a lawyer, doctor or pilot. WGU serves more than 40,000 students in all 50 states, including a large teacher preparation program (see feature). Following suit with a grant from the federal government, Southern New Hampshire University designed a competency-based bachelor's degree.[38]

The desire for new and better forms of assessment of learning is often at the heart of these shifts. Increasingly, demonstration of competence is being seen as the goal. Technology is making this possible at scale and across several disciplines. Blended learning models such as the flipped classroom that couple face-to-face and digital resources are impacting pedagogy in classrooms from elementary school to graduate school. Even medical education, which has largely looked the same for more than 100 years, is shifting as professors consider how technology can improve learning opportunities. UC Irvine School of Medicine is "digitizing just about all of the learning content that students use" which ensures "students have a lot of flexibility around where, when and how they learn."[39]

Next-Gen Teacher Prep at WGU. *Western Governors University (WGU) is an online competency-based university and the largest provider of math and science teachers in the country. It is the only online university accredited by the Council for the Accreditation of Educator Preparation (CAEP, formerly NCATE) and licenses teachers in every U.S. state. Combined with an affordable price tag (about $6,000 per year), self-paced learning and the ability for student teachers to test out of subjects, WGU's Teachers College program has seen enrollment grow to over 11,000 students. WGU has managed to create a teacher-training program that is flexible, affordable and produces high-quality teachers. Their students perform above average on Praxis and state licensure tests, and the program's flexibility increases students' likelihood of completion and allows motivated students to finish early. A majority of Teachers College students are between 35 and 45 years old and working full-time—many are changing careers. Student teachers are grouped into cohorts of 10 to 12 and matched with faculty advisors for group mentorship and discussions. Students at WGU are also part of a large online community, facilitated by faculty, where students can exchange ideas or get help with their self-directed studies. The flexibility of the program also means that WGU can tailor instruction to meet not only national standards but also state, district or network needs.*

Technology-enabled distance-learning options such as Coursera "invested substantial effort in developing the technology of peer assessments, where students can evaluate and provide feedback on each other's work."[40] Using crowdsourcing algorithms, Coursera expects "that by having multiple students grade each homework, we will be able to obtain grading accuracy comparable or even superior to that provided by a single teaching assistant."[41] Panther Learning (with intellectual property developed at Carnegie Mellon University) uses similar strategies to extract bias from peer-reviewed essays and get objective assessment of student learning. Antioch University, with five campuses nationwide and a strong online student body, recently announced that it would be the first higher education institution to offer credit for MOOC courses. The American Council on Education (ACE) has positioned itself to evaluate Coursera courses and maintain a transcript registry for students of courses that might receive ACE credit recommendations. This move toward lower-cost course work free from geographic restrictions is key to enabling the sort of competency-based education that the credit hour framework cannot provide. The online degree pathway, including such platforms as Propero, Straighterline and UniversityNow, is democratizing access to the skills and competencies that post-secondary education has to offer, while giving students true measures of success through mastery assessment in addition to assessments from College Board (AP) or the College Level Examination Program (CLEP).

"Bottom line," said Todd Hitchcock of Pearson Embanet, "I have a lot of hope for the university—more than I did a year ago—but, the change is going to come from a number of early adopters who are willing to embrace entirely new models of delivery and launch new programs beyond what they traditionally have."[42]

At Asia Society schools, professional development is done in a blended environment—some online and some offline. They use ShowEvidence to upload teacher professional modules "so that the teachers can experience the platform as the students would see it."[45]

K-12 Innovators

To find innovation in education, start by entering the K-12 classroom and asking teachers what they do to make their jobs and their students learning more efficient and meaningful. The expansion of collaborative opportunities for students and teachers has grown exponentially with the expansion of technology. We have witnessed a groundswell of bottom-up, teacher adoption of educational technology—with more than 100,000 learning applications in the Apple Store. Teachers and students are putting apps, open educational resources and teacher-made digital tools to work long before district adoption cycles catch up.

Communities for teachers, both for content collaboration and for professional development, are also quickly stretching beyond traditional brick-and-mortar walls. Teachers are gathering and sharing ideas on Pinterest, videos on LearnZillion, assessments on MasteryConnect, lessons on BetterLesson, and units on Edmodo. States and districts are using Bloomboard to evaluate teachers and connect their individual development plans with online resources. PD360, an on-demand learning system for teachers from School Improvement Partners, is connecting the social aspects of technology with becoming a better teacher. The potential for becoming a master teacher, analogous to a Special Forces soldier in the military, is no longer about the process and practices handed down from the teacher around the corner or the administrators

running the show, but about open connection to the industry's best practices. Things are changing quickly, and access to pedagogical masterminds is at an all-time high, driven both by the need and desire for innovation and continuously improving opportunities for teachers to learn, share and connect with experts and each other.

Educators who join online communities, and who connect via social media as a professional learning tool, represent an important trend in professional development. Technology is redefining professional learning communities (PLCs), which allow for feedback and collaboration within the teaching community while increasing student learning. There are now PLCs for teachers by level and discipline, PLCs for teachers in districts and regions, PLCs for principals—and PLCs for aligning, sharing and discovering materials relevant to the Common Core. PLCs combine interest, flexibility and community while focusing on results and maintaining collective goals and actions.

Sanderling, a social platform for teacher competence development from An Estuary, provides an example of technology redefining professional learning communities (PLCs).

The idea of teachers being isolated within four walls and students being limited to the knowledge and capacity of that one teacher is quickly receding into the past. Schools are social institutions that rest upon a social base for achieving their vocational and scholarly activities. Thus, building relational trust among educational professionals and creating relationships without physical boundaries that connect over passion, expertise and a shared desire to become better is the unstoppable innovation of today's education.

Teacher Residency Programs: *In response to the growing need for high-quality teachers capable of engaging today's students and raising student achievement, teacher residency programs have emerged as an alternative to traditional licensure paths. The various nation-wide programs offer a mixture of incentives and structures, with the common outcome of creating Deeper Learning scenarios where teaching is learned through praxis and mentorship. The success of the residency model lies in creating a pathway for professionals in other fields to step foot into the classroom armed with the concentrated knowledge it takes to teach.*

Like a medical residency program, teachers in residency programs learn and practice under the supervision of licensed veteran teachers while at the same time working toward a professional degree in teaching. The model has been successful at recruiting and training committed teachers (with less burnout) for hard-to-fill positions. The Denver Teacher Residency (DTR), for example, focuses on training talented teachers for high-need teaching positions like science and math for grades six through twelve. Teachers commit to the program for five years and earn a salary as well as priority for a full-time teaching job at a Denver public school when they finish. The Boston Teacher Residency (BTR) program asks for a three-year commitment from residents, who spend an academic year working alongside a public school teacher and graduate with a master's degree in education from the University of Massachusetts Boston and a Massachusetts Initial Teaching License.

A 2011 study found that teachers trained using the residency approach improved over time: they had a "modest positive impact on student achievement" compared to other novice teachers, and the program succeeded in "drawing a more ethnically diverse group of teachers to the profession than is typical; its candidates were more likely to teach the hard-to-fill subjects of math and science, and they were also much more likely than other new teachers to stay in the classroom for at least five years." Additionally, by their fifth year, residency-trained teachers were "outperforming other teachers with the same level of experience by nearly [two months' worth of learning]. What's more, they had improved rapidly enough to best veteran teachers with more than six years of experience."[43]

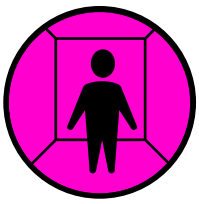
The residency model has been taking root. In 2007, Urban Teacher Residency United (UTRU) was founded to develop, launch, support and accelerate the impact of residency programs: "UTRU partners with school districts, charter management organizations, institutions of higher education, not-for-profits, and states to develop teacher residency programs as quality pipelines of effective and diverse new teachers."[44]

Acknowledging that "a transformed public education system requires a new vision of teaching," CCSSO released Model Core Teaching Standards and Learning Progressions for Teachers 1.0. The 10 key standards for training teachers fall into four distinct categories:

THE LEARNER AND LEARNING

Standard #1:
Learner Development.
The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

Standard #2:
Learning Differences.
The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.



Standard #3:
Learning Environments.
The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning and self-motivation.

CONTENT

Standard #4:
Content Knowledge.
The teacher understands the central concepts, tools of inquiry and structures of the discipline(s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.

Standard #5:
Application of Content.
The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity and collaborative problem solving related to authentic local and global issues.

INSTRUCTIONAL PRACTICE

Standard #6: Assessment.

The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress and to guide the teacher's and learner's decision making.

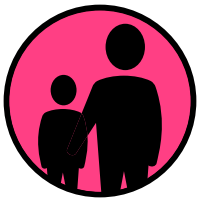
Standard #7: Planning for Instruction.

The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills and pedagogy, as well as knowledge of learners and the community context.

Standard #8: Instructional Strategies.

The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

PROFESSIONAL RESPONSIBILITY



Standard #9: Professional Learning and Ethical Practice.

The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals and the community), and adapts practice to meet the needs of each learner.

Standard #10: Leadership and Collaboration.

The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals and community members to ensure learner growth, and to advance the profession.

Competency-Based Teacher Preparation & Development

Just as we have the opportunity to design assessment systems that prioritize performance for students, teachers also will benefit from a system full of opportunities to demonstrate competence across of an array of skills that they develop throughout their career. Teachers can be credentialed and progress professionally as they demonstrate greater competence. This section describes this envisioned system where teachers progress based on demonstrations of their abilities.

The Case for Competency

In describing competency-based learning for students, the U.S. Department of Education explains that depending on the strategy, competency-based systems can "create multiple pathways to graduation, make better use of technology, support new staffing patterns that utilize teacher skills and interests differently, take advantage of learning opportunities outside of school hours and walls, and help identify opportunities to target interventions to meet the specific learning needs of students."[46] A shift to competency-based learning for teachers would yield similar positive results—ultimately supporting a new generation of teachers equipped to thrive in blended, personalized learning environments in which students engage in the development of Deeper Learning competencies.

It is becoming clear that the learning tools and strategies that enable flexible time, place, path and pace have the potential to create much more productive learning environments not only for students, but for K-12 teachers as well.

Elements of A Competency-Based System

Imagine a map of what a learner needs to know, different ways to learn it, and a collection of demonstrations of competence. Those three ingredients are key to any competency-based environment—from K-12 to any form of job training. For decades, military and corporate trainers have back-mapped learning experiences from job requirements. Doctors, lawyers and accountants have long been required to pass certification exams before gaining access to the profession.

Blended Learning and Teacher Preparation.[47] *MIND Research Institute offers a great example of the kind of partnerships between K-12 and Higher Education that will be necessary to better prepare teachers to be successful in personalized, blended learning environments The mission of MIND's Spatial-Temporal Math (ST Math) is to ensure that ALL students are mathematically equipped to solve the world's most challenging problems. With their mission in mind, they are offering the program to universities free of charge. ST Math University starts with building university partnerships. With no cost to the school, the MIND team helps embed ST Math into the teacher-credentialing program and math methods courses then works to train the teacher, giving them a unique learner experience that fosters their own "ah-ha moments" and provides a safe place to gain a more conceptual understanding of mathematics. Teachers are encouraged to feel what its like to learn math in the same way their students will. In addition, teachers spend time learning how to implement blended programs effectively, how to group students, use data efficiently, and how to use ST Math within core content. With universities' drive to stay relevant, motivated teachers' demand for a different way to teach mathematics, and the country's focus on college and career-ready standards, a program like this is not only vital to the future of math education but an outstanding model for the way in which K-12 and Higher Ed must come together to better prepare teachers for personalized, blended learning.*

A system of teacher development linked to the needs of hiring entities that award licenses based on demonstrated competence could inform personalized development pathways for teachers.[48] Some of these pathways could continue to be part of a degree program, while alternative pathways could be more rapid and linked to specific school models.

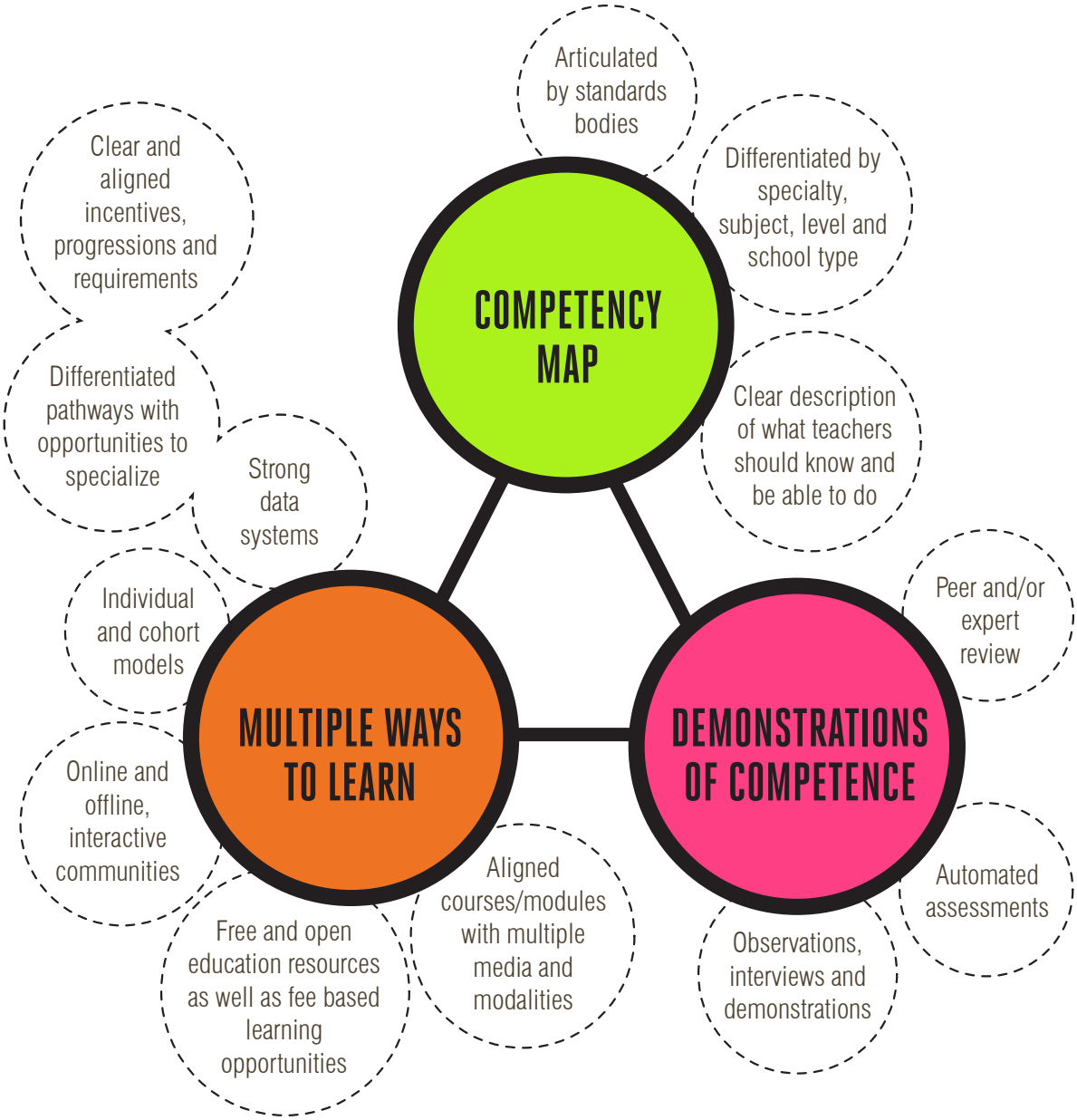
In some cases, a unique model school system could create their own competency map, ensure model-specific training and conduct their own assessments. In such a case there is close connection between all three of these elements, such as at Summit Public Schools system. At Summit, there are four articulated levels of expertise across seven dimensions of effective teaching, and assessment of competency is based on multiple observations and data sources. In other cases, the decoupling of the three elements can provide flexibility in terms of hours, timelines, modalities, sources, etc., creating freedom from restrictions such as how skills are learned and how subsequent credit is earned. Numerous variations of this developmental framework would be available to aspiring as well as in-service teachers. The evolution of this system undoubtedly will provide hiring entities with opportunities to develop new policies and practices that take advantage.

Micro-Credentialing New Skills

One promising strategy in support of competency-based pathways is the design and implementation of micro-credentials that are displayed as digital badges. Recent research and development efforts have focused on the use of digital badges or tokens to signify accomplishment, measure and reward competency-based outcomes. Micro-credentials can be awarded to those who have successfully demonstrated competencies worthy of recognition as a means to increase educator capacity around multiple aspects of the education profession.

COMPETENCY-BASED DEVELOPMENT SYSTEM

A Competency-Based System for Teachers would include the following:



Teacher Success At Summit. *Summit Public Schools currently serves more than 1,600 students in California's Bay Area. The goal of their five high schools and one middle school (serving grades six through twelve) is to prepare all their students for four-year colleges by creating self-directed learners. They emphasize continuous growth of both students and teachers, and their model of teacher professional development is one to watch.*

Every Summit teacher participates in at least 40 days of professional development per year, and it mirrors the self-directed learning model Summit's students use. Kieran McMillen, Director of Professional Development for Summit Public Schools, explains: "Part of [self-directed learning] is guiding and coaching students through a self-directed learning cycle which has five phases. We ask students to set a goal, make plans to work towards that goal, learn towards the goal, eventually show what they've learned, and finally reflect on that whole process. And that cycle repeats. Teachers go through the same self-directed process."

Teachers have two-week chunks of professional development time at four times throughout the year. During these two-week chunks, teachers set their own professional goals. Their goals are public for other faculty members to see—a technique that helps motivate teachers to see them through and also allows teachers with similar goals to form "study groups" and work toward their goals together.

Teachers have access to both in-house and out-of-house professional development. Teachers are encouraged to research resources that will help them with their professional development goals, and Summit encourages teachers to share their knowledge with each other. For example, if a teacher knows a lot about "backwards design" and there is a study group interested in learning more, she or he might give a "workshop" for that study group.

Summit also arranges professional development workshops on topics teachers have expressed interest in, which are optional for all teachers to attend, and their Academic Team assists with research and connects teachers with outside experts. "For example," says McMillen, "we place heavy emphasis on developing cognitive skills in our students and that requires using a common rubric across all our schools. Since this is new to our schools, we partnered with a group at Stanford to refine our rubric but also to come give professional development training to our teachers. Most of [the time during] those two weeks chunks is self-directed. Teachers get to choose what they do with that time. Their time is not set up with a whole bunch of meetings. They can use that time as they see fit."

In addition to four two-week professional development periods throughout the year, teachers also meet weekly with their peers to collaborate around curriculum, assessment and instruction, and they are also given the opportunity to participate in optional two- to six-week professional development options over the summer.

These credentials are created by an issuer and can reward participation, involvement, completion and content consumption, as well as recognize the demonstration of specific skills. Credentials awarded based on performance will be of greater value than those awarded strictly on participation. The unique value of micro-credentials includes that they are specific, personal, efficient, flexible, transparent and portable. For the purposes of this paper, we will focus on credentials awarded for demonstrations of competence, represented by an artifact (a video, a portfolio, student work or other appropriate representation) produced by the earner.

Digital Promise and The Badge Alliance. *In February, the Badge Alliance—"a distributed body to oversee and guide the continued momentum of the open badge movement"—was announced at the Summit to Reconnect Learning. The Alliance, which will operate independently, will bring together key stakeholders in the development and support of a thriving badge ecosystem. As a founding member of the Badge Alliance, Digital Promise is working to develop a series of micro-credentials for teachers that will empower them with the same personalized learning experiences and opportunities to demonstrate competence that others will create for students. The Digital Promise micro-credential initiative will establish a performance-based approach to assessing teaching practices and use a combination of expert and peer reviews to ensure rigor and ultimately market worth. Teachers are encouraged to volunteer and sign-on as early adopters of the badging pilot program.*

Mozilla and the Alliance for Excellent Education explain in "Expanding Education and Workforce Opportunities Through Digital Badges" that the value of a micro-credential is created by the issuer of the credential: "Badge issuers are individuals, schools, employers, institutions, communities, or groups that create credentials to demonstrate mastery of skills and achievements that are of particular value to the issuer."[49] In this case, the issuer has defined the value of the credential. For those credentials that are pursued by a micro-credential candidate, the earner finds value in a badge as well. Future developments around micro-credentials will seek to establish value beyond either issuer or earner, to include the institution.

Micro-credentials are best designed by those most able to articulate the specific skill or knowledge to be assessed. A professional organization may develop micro-credentials around the skills inherent in its piece of the profession. For example, a professional science organization may decide that the ability to explain complex concepts at a developmentally appropriate level is one aspect of teaching science. A library organization may develop micro-credentials around information or media literacy. An organization dedicated to supporting students on the autism spectrum may develop micro-credentials specific to the strategies teachers may need to develop when they have a student with this disability in their classroom. An early childhood organization may develop micro-credentials for organizing, designing or managing a Kindergarten classroom. Micro-credentials can be developed on the ability to conduct a Socratic Seminar, set up and manage a class rotation model, or create performance tasks that develop creativity. The "micro" nature of these credentials suggests the possibilities are numerous and dictates that the skill can be articulated and a rubric-based scoring guide designed to support the assessment of that skill.

Once a competency is identified and described and a rubric has been created, the method of assessing that skill can be assigned. For example, the earner might be required to upload a video demonstrating competence, submit a portfolio of a project, showcase an exemplar of student work, develop an interactive animation or an explanation, develop a game or resource, etc. Reflection may be an important part of the submission as well.

Once submitted, an individual expert, an expert panel or a peer panel can be assigned to score the submission against the rubric. There are methods being developed that support developing inter-rater reliability in an effort to establish credibility and the integrity of the earned credentials. Once assessed, feedback and response would then be passed back to the prospective earner.

A shift to micro-credentials would give educators a compelling way to capture demonstrations of competency. Within the ecosystem of micro-credentials for educators, there are five distinct parts to the badge issuer/earner process.

- Issuer identifies and describes competencies;
- Issuer establishes requirements for earning micro-credentials;
- Earner produces and submits artifacts that demonstrate competency and meet the requirements defined by the issuer;
- The submitted artifacts are assessed by experts or peers; and
- Credentials are awarded and shared.

Applied to digital badges, a managed peer review process could be key to fully scaling up a system of awarding high-value, trusted badges for educators. This strategy requires the creation of customized rubrics, a process for the submission of artifacts to be evaluated, the process (and incentives) for conducting peer review, and methods for eliminating reviewer bias.

If successful, the earner can then collect a credential (a visual representation that includes the metadata associated with that micro-credential) and share it with the world. An important aspect of these credentials is their open nature, enhancing the earners' ability to share and expanding understanding about the nature of the credential as well as the artifact produced to earn it.

More work needs to be done to significantly scale the development and implementation of micro-credentialing, while maintaining a focus on value by ensuring integrity, reliability and validity of earned micro-credentials.

Culture in Support of Competency. *Better teacher preparation is vital. Perhaps even more important are school cultures with opportunities to learn, shared information and ownership, and respect and collaboration.*[50] *A white paper authored by the National Network of State Teachers of the Year (NNSTOY) explains that guiding principles, distributed leadership, collaborative practices and actionable feedback are all critical parts of school culture.*[51]

Moving Toward A Competency-Based System

WGU President Robert Mendenhall explains, "Moving competency-based education into the mainstream will require a fundamental change in the way we look at higher education in America, but the improvements we will gain in student learning, efficiency, and affordability will be worth it."[52]

Turning this ship toward a system of competency-based preparation will require the commitment and collaboration of leaders across K-12, higher education and education policy. We offer the following recommendations.

Create Career Pathways. Teachers and leaders should have access to career pathways where options and competency-based steps are clearly identified. The shift to digital learning creates new opportunities to extend the reach of great teachers and expands teacher leadership opportunities—as identified in Improving Conditions and Careers, a report that builds on Public Impact's

Policy Recommendations to Support Next Gen Teacher Training

- *Use an outcome-focused accreditation/authorization process to approve traditional and alternative preparation programs (for a period not to exceed five years) based on design adherence to best practices and the demonstrated effectiveness of graduates.*
- *Require accredited/authorized programs to use demonstrated competence rather than courses and credits to certify teachers.*
- *Require teachers and the programs that prepare them to renew licensure based on demonstrated performance.*
- *States should encourage (with grant-supported requests for proposals) alternative district/network-linked preparation programs.*
- *If states require pre-service tests like edTPA, they should set minimum requirements as well as require teachers to demonstrate effectiveness in the classroom.*

Opportunity Culture initiative. The lack of advancement opportunities is often why teachers leave the profession.[54] A comprehensive report from National Network of State Teachers of the Year (NNSTOY) and the Center for Educator Effectiveness calls for new teacher career pathways inspired by other professions and international exemplars in education, asserting, "The teaching profession needs to recognize and reward expertise by following the lead of other professions that create diverse and flexible career options; link compensation to performance, expertise and responsibilities; and work to retain 'high achievers.'"[55]

Consider the Role of State Policy. There is a growing recognition that states have an important role to play in ensuring high quality education for public school students, starting with teacher preparation and accreditation and continuing on to include expanding the pool of prepared teachers, evaluating teachers, retaining effective teachers and removing ineffective teachers.[56]

According to a recent report from The Education Trust, teachers "need systems that do at least three things: equip them with rigorous learning standards, prepare them to support their students in meeting those standards, and provide them with meaningful feedback on how they are doing."[57] Some states and districts have implemented systems for evaluation that "aim to identify real differences in effectiveness and generate information that triggers targeted supports, professional opportunities, and smart district staffing decisions,"[58] but that is not enough. States also owe teachers effective systems with tools, teams and developmental pathways that allow them to be successful and to grow professionally.

Building Badges.[53] *Building on its competency-based approach to teacher preparation, Relay Graduate School of Education plans to pilot a micro-credentialing system for teacher training and career development. Relay imagines badges to be a visually-compelling, inspirational, and portable metaphor for the field. Relay believes a system of badging has the potential to:*

- *Improve the structure and communication of teacher career development milestones;*
- *Help establish a more common vocabulary of the knowledge, skills, and mindsets that great teachers should pursue and possess;*
- *Provide an organized framework for teachers to more independently direct and select their own professional development activities to satisfy their training needs;*
- *Suggest a clearer system for schools to differential professional development for its teachers;*
- *Empower principals with better tools to inform hiring decisions;*
- *Enable research to improve the field, as correlations between badges and outcomes may be observed over time.*

Take Developmental Steps. The Center for American Progress speaks to a new starting point when it comes to these shifts, stating, "With a competency-based approach, you do not begin preparing a course syllabus by identifying content and readings. Instead, you begin by identifying competencies and then select the content, readings, and assignments to support student attainment of those competencies."[59] We believe that shifting to a competency-based approach for teachers will demand a similar approach and must move through a series of development steps:

- Compile a competency map of what teachers and teacher leaders need to know and be able to do, with customized elements for specific needs (teacher leader, blended, rural, at risk etc.
- Update the map for new roles, paying particular attention to implications based on the advancement of digital learning as well as new strategies that evolve based on research.
- Tag existing (open and proprietary) instructional content and resources to the competency map and identify gaps.
- Design, develop or identify technology based platforms that:
  - Facilitate assessment/observation of knowledge, skills and dispositions of aspiring leaders;
  - Support development of individual learning plans;
  - Deliver playlists of content
  - Track content consumption (and learning to the extent possible) for initial as well as ongoing development;
  - Provide cohort collaboration features and professional learning communities;
  - Provide publishing opportunities for a professional portfolio and references.
- Support pilot and demonstration projects.

Conclusion

The 2010 National Education Technology Plan (NETP), Transforming American Education: Learning Powered by Technology encouraged new strategies for developing the skills of educators, not only during their preparation but also throughout the course of their professional careers. An estimated $2 billion of federal funds is spent each year on the professional development of educators in the K-12 school system. Yet despite this large expenditure, most professional development opportunities remain tied to traditional approaches, such as pre-arranged in-service sessions that are staid and often fail to meet the actual needs of participants at the most opportune time. As we focus on improving engagement, productivity and efficiency by personalizing learning for students, we have the opportunity to provide educators with personalized opportunities that will enable them to continuously learn and improve their practice.

Teachers who pursue, develop and maintain connections across the profession will encounter numerous opportunities to learn and develop increasingly sophisticated skills, knowledge and strategies—not only by taking aforementioned classes, but also by reviewing online resources, consuming freely available videos, establishing membership in specialized communities of practice, seeking experts to support a singular problem of practice, posting videos and soliciting commentary and annotations as feedback. Teachers can co-develop materials and publish to a wide audience and those materials can be improved upon by others. These and many other opportunities make up the multiple ways to learn in a competency-based development system described in this report.

These multiple opportunities to learn are available to teachers because of the open publishing of research, strategies and resources online, the social interactions within online environments and the scale and spread inherent in the vastness of the Internet. As articulated in the NETP, the highly connected educator has access to this wide array of content, tools and resources, is engaged with colleagues and experts, and seeks the tools to orchestrate more personalized, deeper and relevant learning experiences for students.

Highly connected and effective educators crave improvement, seeking professional connections and resources to better their teaching practice, add to their expertise and support their role as a collaborator in their students' increasingly self-directed learning. These educators who participate in professional learning networks not only get better at their jobs, they also benefit their students by modeling 21st century learning.

At the same time new opportunities for personalized learning are emerging, competency-based learning and assessment is trending for student learners and should be applied to learning among professional educators, with success measured not by time spent but by performance and demonstration. In short, teachers can be assessed for attainment of competence, regardless of how they developed it.

There is an opportunity to better prepare and develop great teachers. Making the shift will require philanthropic investment, political courage on the part of state policy makers and intentional partnerships between school operators and training providers. With higher expectations and the shift to personalized learning, a competency-based teacher preparation and development system can better prepare teachers to thrive in Deeper Learning environments and offers a great chance to boost the achievement of American students.

Appendix A: Personalization v Differentiation v Individualization

Personalization v Differentiation v Individualization Chart (v3)

There is a difference between personalization, differentiation, and individualization.
One is learner-centered; the others are teacher-centered.

Personalization	Differentiation	Individualization
The Learner…	**The Teacher…**	**The Teacher…**
drives their own learning.	provides instruction to groups of learners.	provides instruction to an individual learner.
connects learning with interests, talents, passions, and aspirations.	adjusts learning needs for groups of learners.	accommodates learning needs for the individual learner.
actively participates in the design of their learning.	designs instruction based on the learning needs of different groups of learners.	customizes instruction based on the learning needs of the individual learner.
owns and is responsible for their learning that includes their voice and choice on how and what they learn.	is responsible for a variety of instruction for different groups of learners.	is responsible for modifying instruction based on the needs of the individual learner.
identifies goals for their learning plan and benchmarks as they progress along their learning path with guidance from teacher.	identifies the same objectives for different groups of learners as they do for the whole class.	identifies the same objectives for all learners with specific objectives for individuals who receive one-on-one support.
acquires the skills to select and use the appropriate technology and resources to support and enhance their learning.	selects technology and resources to support the learning needs of different groups of learners.	selects technology and resources to support the learning needs of the individual learner.
builds a network of peers, experts, and teachers to guide and support their learning.	supports groups of learners who are reliant on them for their learning.	understands the individual learner is dependent on them to support their learning.
demonstrates mastery of content in a competency-based system.	monitors learning based on Carnegie unit (seat time) and grade level.	monitors learning based on Carnegie unit (seat time) and grade level.
becomes a self-directed, expert learner who monitors progress and reflects on learning based on mastery of content and skills.	uses data and assessments to modify instruction for groups of learners and provides feedback to individual learners to advance learning.	uses data and assessments to measure progress of what the individual learner learned and did not learn to decide next steps in their learning.
Assessment **AS** and **FOR** Learning with minimal **OF** Learning	Assessment **OF** and **FOR** Learning	Assessment **OF** Learning

The Personalization vs Differentiation vs Individualization (PDI) v3 chart was developed by Barbara Bray and Kathleen McClaskey, co-founders of Personalize Learning, LLC (www.personalizelearning.com) in response to confusion around Personalized Learning that exploded in 2010 with the release of the National Education Technology Plan that defined the terms: Individualization, Differentiation, and Personalization. All three terms were identified in the plan as "instruction." Each term meant what teachers were to do to the learning needs of learners.

- Individualization refers to instruction paced to learning needs of different learners.
- Differentiation refers to instruction tailored to learning preferences of different learners.
- Personalization refers to instruction paced to learning needs, tailored to learning preferences, and tailored to the specific interests of different learners.

Barbara and Kathleen compared these three terms in the Personalization vs Differentiation vs Individualization (PDI) chart as they relate to the learner. Differentiation and Individualization are teacher-centered. Personalization is learner-centered. In teacher-centered environments, the teacher tends to be the hardest working person in the classroom. Under learner-centered environments, the learner takes control of their learning and is challenged to work harder than their teacher.

Individualization is usually where the teacher accommodates learning needs for each learner. Differentiation means the teacher adjusts learning needs for groups of learners. Personalization means learners connect learning to their interests, talents, passions, and aspirations.

The PDI chart is used as a guide with prompts as conversation starters especially for schools that want to build a common language around the term "Personalized Learning." Educators can find more information on www.personalizelearning.com.

Author Bios

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Karen Cator is President and CEO of Digital Promise. From 2009-2013, Karen was Director of the Office of Educational Technology at the U.S. Department of Education, where she led the development of the 2010 National Education Technology Plan and focused the Office's efforts on teacher and leader support. She also was a leading voice for transforming American education through technology innovation and research. Prior to joining the department, Cator directed Apple's leadership and advocacy efforts in education. In this role, she focused on the intersection of education policy and research, emerging technologies, and the reality faced by teachers students and administrators. She began her education career in Alaska as a teacher, ultimately leading technology planning and implementation. She also served as Special Assistant for Telecommunications for the Governor of Alaska. Cator holds a Master's in school administration from the University of Oregon and a Bachelor's in early childhood education from Springfield College. She is a past chair for the Partnership for 21st Century Skills and has served on boards including the Software & Information Industry Association-Education.

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Carri is the Director of Policy and Research at Getting Smart. With a background in both policy and practice, she has taught in classrooms from elementary schools to college campuses. Carri served as an online educator from 2005-2012 in a fully online Master's program in educational leadership and has authored several pieces on the future of education. In addition to Getting Smart's publication portfolio, she co-edited the book Building a 21st Century U.S. Education System published by NCTAF and worked on a number of state-level education policy briefs and reports. Over the past several years, Carri has been actively engaged in supporting education policy efforts to advance personalized and competency-based blended learning opportunities. She holds an M.Ed. in educational administration and an Ed.D. in urban educational leadership.

Tom Vander Ark

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Tom Vander Ark is author of Getting Smart: How Digital Learning is Changing the World and CEO of Getting Smart, a learning advocacy firm. Tom is also a partner in Learn Capital, an education venture firm. Previously he served as President of the X PRIZE Foundation and was the first Executive Director of Education for the Bill & Melinda Gates Foundation. Tom served as a public school superintendent in Washington State and has extensive private sector experience. Tom is Treasurer for the International Association for K-12 Online Learning (iNACOL), chair of Charter Board Partners, and serves on several other boards.

Disclosures

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Endnotes

1. Schneider, C. and Vander Ark, T. "Deeper Learning For Every Student Every Day." Getting Smart. January 2014. http://cdno3.gettingsmart.com/wp-content/uploads/2014/02/Deeper-Learning-For-Every-Student-FINAL-.pdf
2. Bray, B. & McClaskey, K. Personalization vs. Differentiation vs. Individualization Chart, v3. Personalize Learning, LLC. March 2014. http://www.personalizelearning.com/2013/03/new-personalization-vs-differentiation.html.
3. The William and Flora Hewlett Foundation. "Deeper Learning Defined." April 2013. http://www.hewlett.org/uploads/documents/Deeper_Learning_Defined__April_2013.pdf
4. To learn more about Deeper Learning competencies, visit http://www.hewlett.org/programs/education-program/deeper-learning.
5. Bailey, J., Hassel, B., Hassel, E., Schneider, C. and Vander Ark, T. "Improving Conditions & Careers: How Blended Learning Can Improve the Teaching Profession." Digital Learning Now May 2013. http://www.digitallearningnow.com/wp-content/uploads/2013/05/Conditions-and-Careers-Final-Paper1.pdf
6. Schneider, C. and Vander Ark, T. "Improving Teacher Conditions and Careers." Vander Ark on Innovation Education Week Blog. May 2013. http://blogs.edweek.org/edweek/on_innovation/2013/05/improving_teacher_conditions_careers.html
7. "Blended Learning Model Definitions." Clayton Christensen Institute for Disruptive Innovation. http://www.christenseninstitute.org/blended-learning-model-definitions/
8. Levine, A. "Educating School Teachers." The Education Schools Project. http://www.edschools.org/pdf/Educating_Teachers_Report.pdf
9. Arnett, T. "Why teacher preparation programs lack the will to change." Clayton Christensen Institute for Disruptive Innovation blog. December 2013. http://www.christenseninstitute.org/why-teacher-preparation-programs-lack-the-will-to-change/

10. To learn more about how to close this digital learning gap, see http://www.digitalpromise.org/karen-cator-big-idea-2014.
11. Cator, K. "Technology will not replace teachers." LinkedIn blog. August 2013. http://www.linkedin.com/today/post/article/20130824042010-2906843-technology-will-not-replace-teachers?goback=%2Empd2_*1_*1_*1_*1_*1_*1_20131009220227*52906843*5why*5leaders*5matter&trk=prof-post
12. "Model Core Teaching Standards and Learning Progressions for Teachers 1.0." Council of Chief State School Officers Interstate Teacher Assessment and Support Consortium. April 2013. http://www.ccsso.org/Documents/2013/2013_INTASC_Learning_Progressions_for_Teachers.pdf
13. Ibid.
14. Learn more about edTPA at http://edtpa.aacte.org/about-edtpa.
15. For a full report on the state of professional development, see http://www.americanprogress.org/issues/education/report/2013/07/15/69592/high-quality-professional-development-for-teachers.
16. Hill, H. "Fixing Teacher Professional Development. Phi Delta Kappan, Vol. 90, No. 07. March 2009. http://www.pdkmembers.org/members_online/publications/Archive/pdf/k0903hil.pdf
17. DeMonte, J. "High-Quality Professional Development for Teachers." Center for American Progress. July 2013. http://www.americanprogress.org/wp-content/uploads/2013/07/DeMonteLearning4Teachers-INTRO.pdf
18. Darling-Hammond, L., Chung Wei, R., Andree, A. & Richardson, N. "Professional learning in the learning profession: A status report on teacher development in the United States and abroad." National Staff Development Council. 2009.
19. Gulamhussein, A. "Teaching the Teachers: Effective Professional Development in an Era of High Stakes Accountability." Center for Public Education. September 2013. http://www.centerforpubliceducation.org/Main-Menu/Staffingstudents/Teaching-the-Teachers-Effective-Professional-Development-in-an-Era-of-High-Stakes-Accountability/Teaching-the-Teachers-Full-Report.pdf
20. Yoon, K.S., Duncan, T., Lee, S.W.-Y., Scarloss, B., & Shapley, K. "Reviewing the evidence on how teacher professional development affects student achievement." U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest. 2007. http://ies.ed.gov/ncee/edlabs/regions/southwest/pdf/rel_2007033.pdf
21. Gulamhussein, A. "Teaching the Teachers: Effective Professional Development in an Era of High Stakes Accountability." Center for Public Education. September 2013. http://www.centerforpubliceducation.org/Main-Menu/Staffingstudents/Teaching-the-Teachers-Effective-Professional-Development-in-an-Era-of-High-Stakes-Accountability/Teaching-the-Teachers-Full-Report.pdf
22. Ibid.
23. DeMonte, J. "High-Quality Professional Development for Teachers." Center for American Progress. July 2013. http://www.americanprogress.org/wp-content/uploads/2013/07/DeMonteLearning4Teachers-INTRO.pdf
24. Ibid.
25. Sawchuk, S. "MetLife Teacher Survey: A Rorschach Test for Policy?" Education Week blog. February 2013. http://blogs.edweek.org/edweek/teacherbeat/2013/02/teacher_prep_accreditation_ove.html
26. Burke, L. and Butler, S. "Accreditation: Removing the Barrier to Higher Education Reform." The Heritage Foundation. September 2012. http://www.heritage.org/research/reports/2012/09/accreditation-removing-the-barrier-to-higher-education-reform
27. Ibid.
28. "Blended Learning Model Definitions." Clayton Christensen Institute for Disruptive Innovation. http://www.christenseninstitute.org/blended-learning-model-definitions/
29. Cator, K. "Karen Cator's Big Idea for 2014: Let's Close the Digital Learning Gap." Digital Promise. December 2013. http://www.digitalpromise.org/karen-cator-big-idea-2014/
30. "Blended Learning—Current Use, Challenges and Best Practices." Kineo & the Oxford Group. 2013. http://www.kineo.com/m/0/blended-learning-report-202013.pdf
31. List generated and adapted from http://gettingsmart.com/2009/12/edu-innovation-requires-investment-and-incentives/ and http://gettingsmart.com/2014/02/can-learn-navys-train-qualification-system
32. Witte, M. "The Learning Revolution: It's Not About Education." Wired. Jan. 2014. http://www.wired.com/insights/2014/01/learning-revolution-education/
33. Skillshare Webpage, "About Us." http://www.skillshare.com/about
34. Another example is Udemy, the leading marketplace for online learning signing up over 21.7 million students in 200 countries. Learn more about Udemy at https://www.udemy.com.
35. "As reported by The Chronicle of Higher Education, Biemiller, L. "QuickWire: Pearson Offers a Badge Platform." The Chronicle of Higher Education blog. February 2014. http://chronicle.com/blogs/wiredcampus/quickwire-pearson-offers-a-badge-platform/50469
36. Christensen, G., et. al. The MOOC Phenomenon: Who Takes Massive Open Online Courses and Why? November 2013. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2350964
37. Laitinen, A. "Cracking the Credit Hour." New America Foundation and Education Sector. September 2012. http://higheredwatch.newamerica.net/sites/newamerica.net/files/policydocs/Cracking_the_Credit_Hour_Sept5_0.pdf

38. For more information on Southern New Hampshire University, see President Paul J. LeBlanc's perspective on "Seeking Answers on Competency." Inside Higher Ed. January 2014. http://www.insidehighered.com/views/2014/01/30/federal-government-needs-experiment-competency-based-education-essay#ixzz2rz59VHb7
39. Fredette, M. "A High-Tech Prescription for Training Doctors." Campus Technology. February 2014. http://campustechnology.com/articles/2014/02/19/a-high-tech-prescription-for-training-doctors.aspx?=ct21
40. Coursera Webpage, "Pedagogy." https://www.coursera.org/about/pedagogy
41. Ibid.
42. Vander Ark, T. "Signaling Job Readiness: Degrees Decline In Value, Alternatives Emerge." Getting Smart blog. February 2014. http://gettingsmart.com/2014/02/signaling-job-readiness-degrees-decline-value-alternatives-emerge/
43. Papay, J., West, M., Fullerton, J. and Kane, T. "Does Practice-Based Teacher Preparation Increase Student Achievement? Early Evidence from the Boston Teacher Residency." The National Bureau of Economic Research. December 2011. http://www.nber.org/papers/w17646
44. UTRU Webpage, "About Us." http://www.utrunited.org/about-us
45. Personal Communication. Brandon Wiley, Asia Society. January 2014.
46. "Competency-Based Learning or Personalized Learning." U.S. Department of Education. http://www.ed.gov/oii-news/competency-based-learning-or-personalized-learning
47. Adapted from Mead, M. "Blended Learning Moves into Teacher Prep Programs." Getting Smart blog. February 2014. http://gettingsmart.com/2014/02/blended-learning-moves-teacher-ed-programs/
48. Vander Ark, T. "Preparing Teachers for Deeper Learning." Getting Smart blog. October 2013. http://gettingsmart.com/2013/10/preparing-teachers-deeper-learning/
49. "Expanding Education and Workforce Opportunities Through Digital Badges." Alliance for Excellent Education. August 2013. http://all4ed.org/wp-content/uploads/2013/09/DigitalBadges.pdf
50. Learn more about creating positive culture at http://www.linkedin.com/today/post/article/20130715184409-2906843-fire-up-teams-by-creating-opportunities-to-learn?trk=mp-reader-card.
51. Bassett, K., et al. "Re-Imagining Teaching: Five Structures to Transform the Profession. National Network of State Teachers of the Year (NNSTOY). October 2013. http://www.edcentral.org/whats-missing-teaching-profession-according-teachers/
52. Mendenhall, R. "What Is Competency-Based Education?" The Huffington Post College blog. September 2012. http://www.huffingtonpost.com/dr-robert-mendenhall/competency-based-learning-_b_1855374.html
53. Personal communication. Mike LaRosa, Relay Graduate School of Education. March 2014.
54. Bassett, K., et al. "Re-Imagining Teaching: Five Structures to Transform the Profession. National Network of State Teachers of the Year (NNSTOY). October 2013. http://www.edcentral.org/whats-missing-teaching-profession-according-teachers
55. Natale, C. Bassett, K. Gaddis, L. & McKnight, K. "Creating Sustainable Teacher Career Pathways: A 21st Century Imperative." Pearson and National Network of State Teachers of the Year. 2013. http://www.nnstoy.org/download/CSTCP_21CI_pk_final_web.pdf
56. See, for example, NCTQ's State Policy Website. http://www.nctq.org/statePolicy/statePolicyHomeNew.do
57. Almy, S., Tooley, M. & Hall, D. "Preparing and Advancing Teachers and School Leaders: A New Approach for Federal Policy." The Education Trust. September 2013. http://www.edtrust.org/sites/edtrust.org/files/publications/files/Preparing_and_Advancing_0.pdf
58. Ibid.
59. Soares, L. "A 'Disruptive' Look at Competency-Based Education: How the Innovative Use of Technology Will Transform the College Experience." Center for American Progress. June 2012. http://www.americanprogress.org/issues/higher-education/report/2012/06/07/11680/a-disruptive-look-at-competency-based-education/