Expanding Education and Workforce Opportunities Through Digital Badges

ALLIANCE FOR EXCELLENT EDUCATION

mozilla

In the twenty-first century, learning takes place almost everywhere, at all times, on all kinds of paths and at all kinds of paces. With the click of a mouse or the touch of a screen, young people and adults can access a wealth of information, analyze it, and produce new knowledge at any time. They can do this, moreover, on a "just-in-time" basis, getting the information they are most interested in, in virtually whatever format they choose.

These learning opportunities break wide open the traditional confines of school walls and school days, and provide more options and opportunities for lifelong learning. Individuals have the ability to develop content knowledge as well as skills such as critical thinking, communication, and collaboration that are essential for productive employment and effective citizenship in the twenty-first century. Students also have the ability to develop specific workforce skills and build on their own interests.

These new learning opportunities raise some important questions: How can young people and adults demonstrate the skills and competencies they have developed? How can teachers and school officials—as well as college admissions officers and employers—ascertain that individuals have developed the knowledge or abilities they consider necessary? How can learners forge their own pathways to further learning?

Digital technology offers one promising solution: *digital badges.*

A badge is a digital credential that represents an individual's skills, interests, and achievements. Among other uses, badges can convey an individual student's core academic content knowledge, as well as other twenty-first-century competencies that cannot be measured by traditional assessments.

This issue brief provides a description of digital badges, including how a badge can be used in K–12 public education, higher education, and the workforce. It also provides examples of how badges are currently being used as well as plans for future opportunities.

WHAT IS A BADGE?

At first glance, the word "badge" may conjure up images of a Girl Scout's sash, featuring material badges that demonstrate her achievements. While the concept is similar, the digital badge has implications far beyond that simple picture. Today's badges are digital credentials that represent skills, interests, and achievements earned by an individual through specific projects, programs, courses, or other activities. There is a learning ecosystem behind the badges that make them powerful and connected credentials. This ecosystem is made up of badge "issuers," badge "earners," and badge "consumers."

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. An issuer creates a set of competencies or curriculum and the assessments to determine if the earner has acquired the necessary skills for the badge. The badge issuer determines the criteria for a badge. While a badge itself is not an assessment, it represents an assessment outcome and provides access to information about that assessment. A badge is hyperlinked to something that demonstrates the criteria for the badge and evidence such as an artifact, testimonial,

or document.[1] For example, a badge for completion of on-the-job training could link to a hands-on learning project that is required by the issuer to be completed and that demonstrates an individual's attainment of skills. In addition, the issuer stores the information behind the badge to verify the learning that has occurred.

A credible badge includes information about when and how it was earned and who issued it.[2] While the information model is standard, each badge has custom information to reflect its meaning, so badges do not need to be the same across organizations or sectors. For example, one high school (the badge issuer) may decide to provide a badge to high school seniors who demonstrate competency in Advanced Placement (AP) science by completing a series of projects designed by the school and a local business. The successful completion of each project, based on the assessments predetermined by the school and local business, represents an achievement that can be individually badged and, taken together, demonstrate that the student has acquired a specific

competency related to the AP science course. In this instance, the badge is created with only the high school, the business, and the student in mind.

Another high school in the same district may also want to work with a local business to create a badge that demonstrates competency in AP science. The projects designed by this high school and local business may be different from the first high school's projects, but the badge would still demonstrate that the student acquired a specific competency related to the AP science course. The digital nature of the badge allows it to be shared across contexts and still communicate its value. The two high schools and two businesses in this example may accept each other's badge if they agree that the credential is based on a valid assessment that demonstrates skills that they value.

Badge earners are individuals who are learning and want to demonstrate a complete picture of their skills and accomplishments to various audiences. For example, individuals could demonstrate, to teachers, employers, or others, knowledge and skills learned outside of school or skills that cannot necessarily be communicated by a standardized test, a resume, or a college application. Badges also give the earner control over how to use the credential and a path for continued advancement and lifelong learning. For example, individuals with an interest in robotics, art, or other activities can discover how to learn more through available badges, and earn badges to recognize their learning and deeper understanding.

Badge consumers are formal and informal education providers, individuals, employers, communities, or other groups that have a need for, or interest in, people with the skills and achievements symbolized by a badge. In some cases, an issuer may also be the consumer.

Badges themselves are also interoperable. The value of a badge to an earner increases when it is portable, can be "stacked" to demonstrate multiple achievements, and can

be shared with a variety of audiences, as determined by the earner.[3] For this reason, it is critical to have an open badge standard that ensures that all badges contain the same information, including criteria and evidence, and allows individuals to earn badges across various issuers, manage them in a collection, and display them across the web. To this end, the Mozilla Foundation has created the "Open Badges" standard.[4] Badges aligning with this standard go beyond just digital badges, and can operate at an ecosystem level.

The Open Badges standard also offers some baseline validation of the badge, including verifying that the badge was, in fact, granted by the issuer to the earner, as well as allowing for easy access to information stored behind the badge wherever it is shared across the ecosystem. The validity of the badge increases based on the quality and detail of this information. For example, the information behind the badge may be linked to accepted education standards, competency frameworks for specific fields or communities of practice, or new standards that emerge from an institution of higher education, a business, or a community of practice.[5] This conveys that the badge aligns with these standards and frameworks.

Badges may also be endorsed by third parties to indicate their support for a badge; this endorsement is added to the information behind the badge. For example, a state department of education could endorse a series of badges from informal education providers, giving those badges,

A Real-World Look at the Badge Ecosystem

A badge program created by the National Design Museum and the Smithsonian's Cooper-Hewitt provides one picture of a badge ecosystem. These organizations have embarked on an initiative to integrate badging into the successful DesignPrep program for underserved New York City high school students. Badges will be awarded at increasing levels for achievement in design disciplines, overall design thinking, and competencies gained through in-person and web-based learning. Some of the highest-level badges will be accredited by professional organizations such as the Council of Fashion Design in America (CFDA) and AIGA, the professional association for design, bolstering resumes and higher education applications.

In this example, the badge ecosystem includes

- **Badge Issuer:** Smithsonian's Cooper-Hewitt, National Design Museum

- **Badge Earners:** New York City high school students

- **Badge Consumers:** Colleges, universities, and companies

- **Value of the Credential:** The highest levels of badges will link to CFDA and AIGA standards

- **Portability/Stackability:** The badges are stored on an open infrastructure, so high school students can look for other learning opportunities related to design thinking and competencies that also issue badges. Students can display all of these badges to potential colleges, universities, or companies, demonstrating their mastery of skills that are valued by design disciplines.

and the skills and knowledge they represent, additional value to the formal school community.[6] Those badges carry that state department of education's endorsement with them wherever they are shared, and the information can be extremely useful and significant in understanding that badge.

It is important that there be only one open badge standard to ensure badge interoperability within the ecosystem. This allows any individual to earn badges from different issuers and pull them into one collection that they own and can share with relevant stakeholders. This also ensures that badge consumers know what to expect when viewing badges and have the information needed to evaluate them. Further, an open standard fosters a market for the development of additional tools and services that can increase the options for issuing, storing, displaying, discovering, and using badges.

HOW DO BADGES WORK?

Badges work differently in different settings. The following sections demonstrate ways in which badges can be used in K–12 education, higher education, and the workforce.

K–12 Education and Badges

The K–12 education system is facing significant challenges in graduating students who are ready for college and careers. In recognition of the changing economy and the demand for high-skilled, well-rounded workers, states have begun to change how their education systems do business. They are increasing the rigor of course work, implementing higher standards, focusing on turning around low-performing schools, and improving graduation rates. States are also beginning to reimagine accountability systems. Many are including multiple measures of achievement to determine student success.

As districts and schools face these challenges, they must build internal capacity and consider new learning opportunities that ensure that students graduate from school with a well-rounded education that includes both core academic knowledge and twenty-first-century skills. Many schools are looking to community partners and increased learning time. As a result, there are more and more conversations about how to use expanded learning opportunities—a longer school day, week, or year, or more before- and after-school and summer learning experiences—to meet the increasing demands of new standards and assessment and to support school turnaround efforts.

These conversations can and should lead to deeper discussions about how to assess the broader set of outcomes students need to develop, and how to determine whether
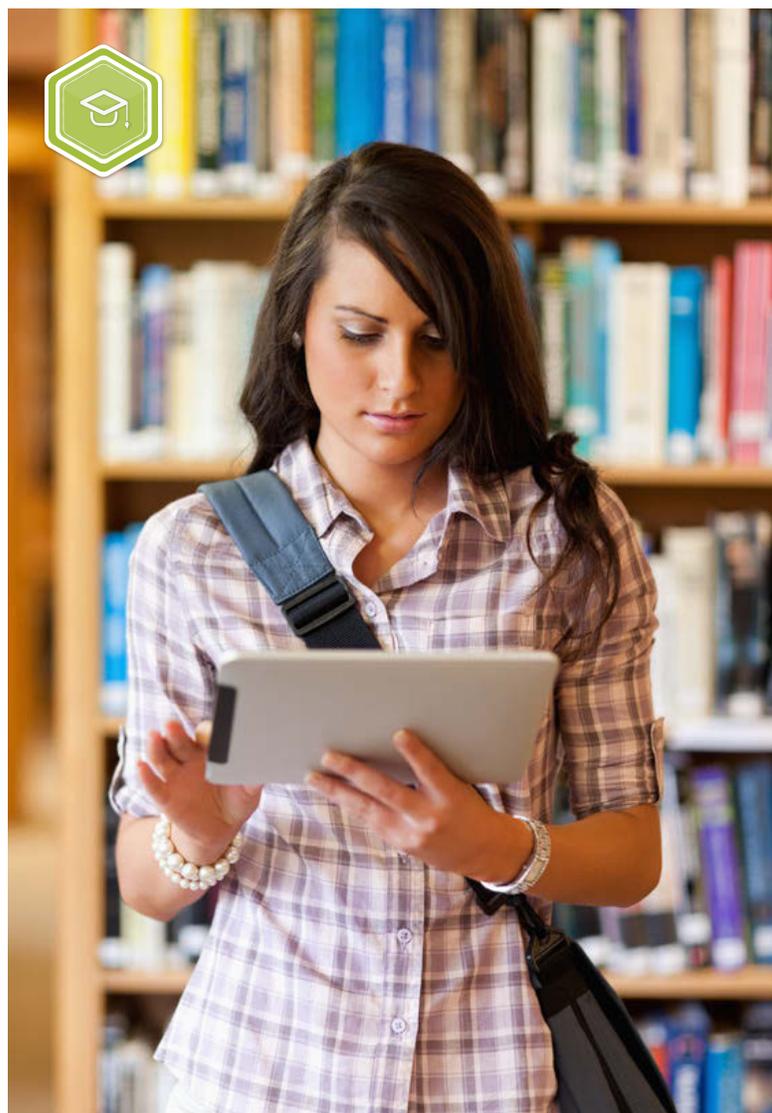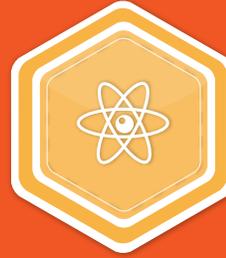
students have attained them, in or out of school. Badges can help accomplish this goal. For example, badges can help educators understand the wide range of skills, knowledge, and interests beyond those that are measured by traditional assessments. Badges can help improve the effectiveness of school-community partnerships and make more and better information about student learning available to both formal and informal education providers.

In fact, communities are already seeing the potential of badges and using them as a bridge between informal and formal education settings, encouraging connections between in- and out-of-school learning, and tapping into student interests to drive student interest, engagement, and achievement.

Chicago Mayor Rahm Emanuel is making it possible for young people to earn badges for engaging in learning activities during the summer and carry those badges, and thus evidence of learning, skills, and achievements, back to their schools in the fall.[7] Teachers will use this information to advance youth or help align course work around interests and capability. Through Mozilla's free Open Badges tools, each organization participating in the Chicago "Summer of Learning" has designed its own badges for youth to earn and collect for completing learning activities over the summer—from field trips, quests, experiments, and self-paced individual efforts to team projects. These roll up into city-level badges that represent key competencies in science, technology, engineering, arts, and mathematics (STEAM).

In addition, the Providence, Rhode Island, school district and the Providence After School Alliance are piloting a badge program. The school district is awarding credit to students who engage in badge-earning learning experiences outside of school.[8]

Both of these examples demonstrate that learning pathways differ from student to student, but badges can bridge those differences and provide students with opportunities to follow their interests, and connect what they have learned, anytime, anywhere, to academic achievement, career success, and civic engagement.

Rhode Island also allows high school students to earn credit by showing proficiency in academic courses needed for graduation, rather than simply proving that they have spent the specified amount of time completing a course (called "seat time").[9] Badges would complement this competency-based education model in both K–12 and higher education.

Higher Education and Badges

Badges could play an important role in competency-based postsecondary education. Competency-based education allows students to advance by demonstrating that they have attained certain competencies rather than by showing that they have spent a certain amount of time in class.[10] Badges issued by colleges and universities could serve as evidence of students' demonstrated mastery of content, even content acquired outside of the formal learning environment. Colleges and universities could

accept badges earned from other organizations, learning experiences, or on-the-job training to help students advance more quickly.

Badges could also help expand provider options for students. If a badge issuer is not the college or university that a student attends, but is endorsed by that institution, the student could have additional learning opportunities that would still contribute to his or her education or help build a broader portfolio of skills. Earners could also come into the institution with badges to demonstrate prior learning and skill development to allow faster placement of students on a path to success.

A badge issued by the college or university a student attends may also allow for learning through outside providers so long as the student can demonstrate the necessary skill attainment required in the assessment for the badge. This flexibility can also help with the constraints faced by "nontraditional" students, allowing credit for learning in informal education settings at a convenient pace and time. It could also help students who need remedial courses to access additional learning opportunities in informal settings that could catch them up and allow them to earn credit at the same time.

> BADGES CAN PROVIDE A LEARNING "MAP" TO HELP LEARNERS SEE THE SKILLS THAT MATTER AND THE OPTIONS FOR GAINING THOSE SKILLS.

Given the potential increased options for students, badges also help learners make better-informed choices about the possibilities and impact of their learning opportunities. Badges can provide a learning "map" to help learners see the skills that matter and the options for gaining those skills. Students who want to be hired for specific jobs in particular fields can tailor their learning experiences, seek learning opportunities, and receive badges that align with what employers are seeking.

The University of California Davis provides a good example of the use of badges to demonstrate the varying skill sets of students. In 2011, the John D. and Catherine T. MacArthur Foundation and Mozilla sponsored a competition for the development of digital open badges.[11] The UC Davis sustainable agriculture program was one of the winners. Instead of being built around requirements, majors, or grades in standard three-credit courses, the Davis badge system is based on the sustainable agriculture program's core competencies.[12] It is designed to measure both formal and informal learning. One example of a core competency is "systems-thinking." A student can get a badge in systems-thinking, and when an employer is considering an applicant with this badge, it can link to the student's portfolio, where it will be possible to see traditional course work and grades as well as evidence of specific skills, such as in integrated pest management, which the individual may have learned by working on a farm.[13]

The Workforce and Badges

Today, while more and more jobs require a college degree, employers are also looking for ways to identify individuals who have the specific skills they are looking for, and to get a better understanding of the skills that individuals bring to the job, including knowledge of the field and expertise gained beyond traditional college course work, and skills such as critical thinking, teamwork, and writing. These may not be apparent on a resume or even in an interview.

Careful hiring practices can help companies avoid the significant costs associated with mistakes. According to the Center for American Progress, it costs businesses about one-fifth of a worker's salary to replace a current worker.[14] Badges could provide important verifiable information to employers about an individual's varying skills, backed by evidence. Badges can present a well-rounded picture of knowledge and competencies that resumes and degrees do not reflect.

Some companies have begun to use badges to hire employees. TopCoder, a platform for a community of software developers, algorithmists, and digital designers, holds online programming competitions that offer digital badges. Competition winners' products are often picked up by the commercial market, but winning the competition and acquiring a badge also is helpful to companies looking for skilled employees.[15]

EXAMPLES OF CURRENT BADGE PROGRAMS

The MacArthur Foundation, HASTAC (Humanities, Arts, Science, and Technology Advanced Collaboratory), and Mozilla Badges for Lifelong Learning competition sparked a wave of innovative ideas. Winners included federal agencies, nonprofit organizations, and businesses. A few winning projects and the badges they represent are highlighted below.

American Graduate: Let's Make It Happen

American Graduate: Let's Make It Happen is a multiyear public media initiative—supported by the Corporation for Public Broadcasting—that helps local communities identify and implement solutions to the high school dropout crisis. A cornerstone of the initiative is to provide top-quality, proven digital educational resources that will engage and motivate at-risk middle and high school youth to stay in school,

graduate, and prepare for college and a career. American Graduate badges provide a pathway to reward and recognize students for their successes and skills attained through participation in key public media/youth media digital education programs, including PBS NewsHour Student Reporting Labs, Roadtrip Nation, and StoryCorpsU.

BuzzMath

BuzzMath provides students with rigorous and engaging practice that leads them to the ultimate goal of obtaining mastery of concepts outlined in the Common Core State Standards (CCSS) for mathematics. All requirements for badge acquisition by students have been designed in accordance with the CCSS. BuzzMath badges convey grade-level mastery of required mathematical concepts and recognize behaviors that lead to achievement and success in mathematics.

Badges Work for Vets

The Badges Work for Vets program helps veterans leverage their military training and unique skill sets by developing badges that visually represent military training and real-world skills acquired while serving in any branch of the U.S. military. At a glance, prospective employers will be able to verify military training completed and know that the veteran applying for a position has the training and skills that make him or her the best possible choice for their company.

NOAA Planet Stewards

The National Oceanic and Atmospheric Administration (NOAA) teamed up with 3D GameLab at Boise State University to create Planet Stewards, a project that provides high school students with personalized learning options and the ability to earn badges representing NOAA sciences career pathways. Using NOAA's content and 3D GameLab's game-based learning platform, students are engaged by choosing among web-based quests and earning experience points, levels, and badges to demonstrate their achievements in weather, climate, coastal, ocean, and lake science, all aligned with national science standards. Whether students are in the field, in the classroom, or engaging in a virtual or game-based experience, Planet Stewards will advance environmental literacy and promote a diverse workforce that encourages environmental stewardship and increases informed decisionmaking.

NASA Content Group

The NASA Content Group (formerly the Robotics and STEM Badges Using NASA Content Group) will use content from NASA, pedagogical expertise of the Center for Educational Technologies, and technical and design prowess of Project Whitecard to provide science, technology, engineering, and mathematics (STEM) learning opportunities, spread awareness of STEM disciplines, integrate standards, and enable the expansion of new content through the creation of a unique collection of digital badges for learners of all ages.

THE FUTURE OF BADGES

It is clear that promising work is being done with badges at the state and local levels through schools, community partners that provide informal education opportunities, colleges, universities, and businesses. Federal opportunities are also ripe for exploration. There is already early support for badges within the U.S. Department of Education; Secretary Arne Duncan has called the use of badges a "game-changing strategy."[16] In addition, the Office of Vocational and Adult Education has commissioned a study to "investigate the feasibility of a badging system for the adult education ecosystem—learners, teachers, tutors, administrators, content developers, professional developers, transition specialists to training and postsecondary institutions, and employers—and make recommendations."[17] This study could open additional doors and lead to possible federal support of badges.

Schools and districts are starting to leverage badges, not only as connectors between in-school and out-of-school learning, but also as a way to facilitate learning in more innovative and engaging ways. In the Adams 50 School District, located outside of Denver, Colorado, teachers are using badges earned by students in after-school programs to better understand students and adapt curriculum to create learning opportunities that build on these interests.

These same teachers could themselves earn badges for re-imagining learning and get recognition for innovation and new skills important for facilitation and teaching in the twenty-first century.

The U.S. Department of Education recently endorsed competency-based learning at institutions of higher education, saying that "instead of using credit hours or clock hours as a measure of student learning, instructional programs may use direct assessment of student learning, or recognize the direct assessment by others of student learning" and still qualify students for federal aid.[18] Interested colleges and universities must seek federal approval for the use of these competency-based learning programs, and they must demonstrate that their accreditors have approved the programs. When speaking about this issue, U.S. Education Secretary Duncan said that competency-based learning would expand access to affordable higher education because it would allow students to fit education into their life and work through classes at their own pace. Badges can play an integral role by supporting recognition on a skill or competency level and allowing learners to create custom pathways.

The House-passed SKILLS Act, which reauthorizes the Workforce Investment Act of 1998, may also open the door for badges. This legislation specifically accepts industry-recognized credentials, and allows postsecondary credentials to be accepted in the federal job training system. Industry-recognized credentials are those sought or accepted by companies within a particular sector, across multiple states, as recognized, preferred, or required for recruitment, screening, or hiring;[19] recognized postsecondary credentials are awarded by a training provider or postsecondary educational institution based on completion of all requirements for a program of study, including course work, tests, or other performance evaluations.[20] Both of these kinds of credentials could be awarded in the form of digital badges.

BADGES CAN PLAY AN INTEGRAL ROLE BY SUPPORTING RECOGNITION ON A SKILL OR COMPETENCY LEVEL AND ALLOWING LEARNERS TO CREATE CUSTOM PATHWAYS.

President Obama's proposed budget for Fiscal Year 2014 also provides potential opportunities for the use of badges. The proposed First in the World program would provide funding to support, in part, projects to develop third-party validation systems that identify competencies, assessments, and curricula for specific fields.

The private sector is also embracing the use of badges. In fact, this year at the Clinton Global Initiative America meeting, corporations and institutions will convene to dig into key industry and sector issues, and many will make commitments around digital badges. This will include working to define criteria for educational, professional, and industry credentialing; incorporating new methods of recognition into university admittance and credentialing and employer hiring and promotion; developing replicable platforms for creating secure digital badges to award, display, and confirm credentials; and establishing third-party endorsement for credible assessment tools.
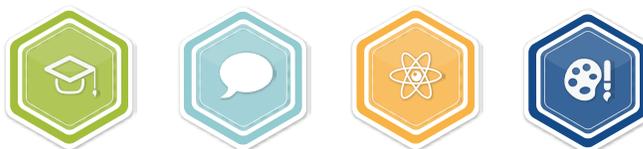
CONCLUSION

There is potential for badges to have an enormous impact on the education, training, and workforce sectors. It is easy to imagine a world ten years from now in which a high school student could graduate with twenty credits represented by a set of badges earned as a peer mentor or a digital expert in the local library. These badges would be recognized by numerous colleges and businesses, giving the student increased opportunities and multiple pathways for college and a career. A science teacher who is midway through her career could earn badges for continued education in her field, allowing her to advance to leadership positions within her school and eventually in the district or state. A company could hire the next great innovator from a software programming competition or form the best team to work effectively together with the right skills to conceive, design, build, and market the next big technological innovation.

For policymakers committed to innovation, badges could be the next crucial step in education reform and economic empowerment. As momentum builds, it will be important for policymakers to continue to explore the many possibilities that badges afford and break down federal barriers to implementation.

It is important to ensure that there is fidelity in implementation and that badge issuers are using the open standard to ensure that the learners stay in control and badges remain interoperable. Badges must be used to encourage anytime, anywhere learning and must provide real and tangible information to educators and businesses in order to better inform them of the talents, skills, and achievements of individuals.

Additional information on efforts to ensure quality badge implementation can be found here:

http://openbadges.org

http://bit.ly/badgevalidation

http://bit.ly/badgepaper

http://hastac.org/digital-badges-bibliography

http://hastac.org/collections/digital-badges

ENDNOTES

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[3] Ibid.

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[5] Mozilla Foundation, "An Open, Distributed System for Badge Validation," 2013, https://docs.google.com/file/d/0BwJ_PQhV0lJTSnYtQzV5Q0FxNDA/edit?usp=sharing (accessed June 10, 2013).

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[13] Ibid.

[14] H. Boushey and S. J. Glynn, "There Are Significant Business Costs to Replacing Employees," Center for American Progress, 2012, http://www.americanprogress.org/issues/labor/report/2012/11/16/44464/there-are-significant-business-costs-to-replacing-employees/ (accessed June 10, 2013).

[15] TopCoder, "The Right and Wrong Way to Issue Digital Badges," http://www.topcoder.com/blog/the-right-and-wrong-way-to-issue-digital-badges/ (accessed June 10, 2013).

[16] L. O'Shaugnessy, "Digital Badges Could Significantly Impact Higher Education," October 4, 2011, http://www.usnews.com/education/blogs/the-college-solution/2011/10/04/digital-badges-could-significantly-impact-higher-education_print.html (accessed June 10, 2013).

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[18] See http://www.insidehighered.com/sites/default/server_files/files/FINAL GEN 13-10 Comp Based 3-14-13 (2).pdf (accessed June 10, 2013).

[19] H.R. 803 SKILLS Act, Section 101 (54), http://beta.congress.gov/bill/113th-congress/house-bill/803/text (accessed June 10, 2013).

[20] H.R. 803 SKILLS Act, Section 101 (55), http://beta.congress.gov/bill/113th-congress/house-bill/803/text (accessed June 10, 2013).