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New and Alternative Assessments, Digital Badges, and Civics:

An Overview of Emerging Themes and Promising Directions

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In a recent factsheet on state civic education requirements,[1] CIRCLE concluded that while "all states have standards for social studies or civics" the number of states that require assessment of social studies has decreased since the passage of the No Child Left Behind Act, and the "scope of the assessments has become increasingly narrow." "States are, to a greater extent, using multiple-choice-only tests that focus primarily on memorizing information, rather than demonstrating civic skills. Furthermore, assessments focus mostly on the history and geography of the United States; far fewer states assess students in world affairs or economics. [2] Ninety-six percent of states require the completion of at least one social studies course to graduate from high school. Yet only eighteen percent require an assessment of the knowledge and skills gained in these learning environments. At the very least, we are not recognizing in any comprehensive way what civic skills and competencies students are acquiring; at worst we are not providing them with the necessities to be engaged citizens of the 21st century.[3]

Civic knowledge, like other cognitive learning outcomes such as math, science, and English, conforms moderately well to standard testing and assessment mechanisms.[4] The harder assessment challenges involve civic skills, both participatory and intellectual, and civic dispositions (values, habits, and attitudes). These challenges are compounded by high-stakes, standardized tests that monopolize teachers' time and leave little left for the more nuanced and complex assessments needed for civics. Additionally, civics needs assessments that can accommodate a diverse set of learning environments (e.g. formal classrooms, after-school programs, community settings), and the long developmental trajectories for civic learning that can span beyond a single grade year or classroom. With all these obstacles to robust, multi-dimensional assessment, there is a clear need to consider alternative evaluation and credentialing processes and systems for civic learning outcomes.

What's all the fuss with digital badges?

The digital badge is one promising approach to overcoming these difficulties. Digital badges are electronic icons awarded for the acquisition of knowledge or skill, and are an increasingly common feature of many web-enabled applications. Catalyzed in late 2010 by a Mozilla Foundation[5] sponsored conference in Barcelona, Spain,[6] they offer flexibility, feedback, and recognition of skills and knowledge gained in multiple contexts.[7] In their most mundane uses, digital badges function as motivational stickers for engagement and encouragement (such as recognition of signing into a homework help site for 30 days in a row). However, they have the potential for greater, extended use for individuals in multiple learning environments to create skill and knowledge portraits more comprehensive than a single letter grade or certificate can capture. Digital badges can represent very finely-grained skills, such as being "able to conduct an effective web

[1] Godsay, S. et al. (2012, p. 9).
[2] *Ibid.*, p. 1.
[3] Perlman, B. (2009).
[4] National Center for Educational Statistics , (2013a).
[5] Mozilla (2013). - Mozilla is a community of developers working in public benefit to keep the Internet free and open
[6] Ash, K. (2012).
[7] Open Badges (2012).

search" to more comprehensive knowledge domains like "Algebra Wizard," and they can be shared with diverse audiences such as employers, friends, and family.

Digital badges have emerged in part as a response to shifting workplace demands that seek accelerated, ever-evolving, and tailored training.[8] Formal degrees from institutions of higher education are perceived as slower to adapt to market needs and as requiring significant investments of time and ever-increasing financial resources on the part of the learner.[9] Proponents of digital badges see them as part of an expanding, globalized, and decentralized communication environment, where access to knowledge and information is fueled by "well-connected communities of learners"[10] that are increasingly situated outside of formal credentialing bodies.

This growing "open education" movement, which includes "massive open online courseware" (e.g. MITx, Coursera),[11] is also fueling the demand for alternative certifications, like digital badges, suitable for new learning realities.[12] As Jeffery Young noted in *The Chronicle of Higher Education*, "the biggest push for badges is coming from industry and education reformers, rather than from traditional educational institutions."[13] Because these are new developments, often being advanced from outside the academy by people immersed in technology, little of the conversations around these issues has yet entered journals and mainstream academic writing. Note that many of the sources cited here are blogs, comments on blogs, presentations, and other informal and sometimes ephemeral venues. The small body of academic work is included as well, and as these trends mature, the research being conducted and the dialogues it inspires will be increasingly represented in the academic press.

One key feature of digital badges is that they make learning achievements visible in newly-emerging, fragmented, and decentralized "networked learning ecosystems."[14] In such systems, where individual learners are highly mobile, digital badges can potentially make visible a comprehensive set of accomplishments obtained in a number of environments.[15] For instance, a compilation of digital badges in civics could recognize the "public speaking" done as part of the extra-curricular high school debate club, "community organizing" that was part of a summer internship during college, "group facilitation" skills developed in a current paid position, and a "good citizen" badge for long-term community service work. In this way, digital badges could be thought of as graphics to add to a résumé or as skill and knowledge "brands." But, as with any iconic emblem, the shared understanding and context of the image are critically important, and may take time to gain wide recognition and adoption.

Like previous networked exchange systems (e.g. music sharing, digital publishing), digital badges and the learning environments they represent also have the ability to disrupt the

[8] Young, J.R. (2012).
[9] *Ibid.*
[10] Hickey, D. (2012).
[11] Young, J.R. (2012); Duncan, A. (2011).
[12] Schneider, D.K. (2012).
[13] Young. J.R. (2012).
[14] Hickey, D. (2012).
[15] *Ibid.*; Ash, K. (2012); Grant, S. (2011).

hierarchies of more formal accreditation systems.[16] This feature might prove useful in the promotion and implementation of broad efforts to assess and promote civic learning outcomes. Badges especially provide an alternative pathway for efforts that may have limited support from centralized educational decision structures or processes like state or national curriculum frameworks or accreditation systems. Potentially, proponents of civic education could design and implement a civic learning ecosystem codified through digital badges.

While there is currently limited theoretical and empirical research related to digital badges, there is a growing system of support and enthusiasm for the concept. The Mozilla Foundation's promotion of digital badging is one among a number of high profile influencers from multiple sectors (e.g. for profit, out-of-school, online learning, instructional technology) that have entered into the digital badge space. The John D. and Catherine T. MacArthur Foundation launched its Digital Media and Learning Initiative in 2006, in order to support explorations of how "digital media are changing the way young people learn, play, socialize, and participate in civic life."[17] In 2007, MacArthur, in partnership with the Bill and Melinda Gates Foundation, the Humanities, Arts, Science and Technology Advanced Collaboratory (HASTAC) at Duke University, and Mozilla, announced the $3M Digital Media Learning Competition,[18] to highlight innovative projects and research in digital badging. Mozilla initiated its Open Badge Project[19] in 2011 to develop an infrastructure for creating, issuing, maintaining, and sharing badges across multiple technology platforms, educational environments, learners, and other interested parties (e.g. employers). In addition to support from big players in the commercial sector such as Intel, Microsoft, and Motorola, digital badges are being promoted heavily by the U.S. Department of Education and NASA[20], along with other U.S. Departments such as Labor,[21] Energy, and Veteran Affairs.[22] In a speech to the 2011 Digital Media and Lifelong Learning Competition, Secretary of Education Arne Duncan remarked:

> Badges can help engage students in learning, and broaden the avenues for learners of all ages to acquire and demonstrate – as well as document and display – their skills . . . Badges can help speed the shift from credentials that simply measure seat time, to ones that more accurately measure competency. . . . [a]nd badges can help account for formal and informal learning in a variety of settings.[23]

[16] Maney, D. (2012).
[17] MacArthur Foundation (2013).
[18] Digital Media and Learning Competition (2013).
[19] Open Badges (2013).
[20] NASA (2011).
[21] Watter, A. (2011).
[22] U.S. Department of Veteran Affairs (2013).
[23] Duncan, A (2011).

Nonprofits like the American Library Association,[24] the 4-H Council[25] and the Corporation for Public Broadcasting are also exploring the potential of digital badges and are key supporters of the Digital Media and Learning Competition.[26]

As these alignments of government, civic sector, and corporate interests push forward, an impassioned debate about the pros and cons of digital badges has emerged. But it is unclear whether the debate is solely about digital badges. The term appears to get conflated with overall critiques and enthusiasms for technology-enabled teaching and learning, including everything from interactive games to massively open online courses (MOOCs).[27] Whether digital badges are proposed as a replacement for traditional degrees or a compliment to existing assessment and credentialing structures also creates miscommunication and misunderstanding.[28] On her blog *Ada Play*, Emily Bembeneck posited that degrees and test scores can be thought of as badges that symbolize certain skills, knowledge, and experience.[29] This framing opens up real questions about the role and potential of digital badges. Perhaps the openness of the digital badge infrastructure is a potential threat to existing assessment and credentialing hierarchies, currently controlled by formal educational institutions and accreditation entities.[30] The networked features that transformed the recording, publishing, and retail sectors are now poised to challenge educational systems. This in turn contributes to the overall unease related to shifts in assessment and accreditation processes prompted by new learning demands and environments.[31]

The digital badge debate has arisen within larger conversations about the assessment of skills and knowledge in rapidly evolving, knowledge-driven societies. Educators in multiple contexts are facing the realities of preparing all students for these complex knowledge environments. In addition to the assessment of concrete content knowledge, post-industrial societies are increasingly demanding that their members demonstrate their abilities in abstract and soft skills areas such as teamwork, critical thinking and analysis, communication, and personal management of time and resources.[32] Emerging efforts such as classroom-based assessment structures, national curriculum standards, and 21st century learning standards are complemented by learning strategies such as problem-based learning, scenarios, modeling, simulations, and games. Digital badges are simply part of this larger and changing learning and assessment ecosystem.

In support of digital badges

Advocates for digital badges come from many places including education reform, private foundations, educational technology and instructional design, vocational and

[24] Young Adult Literacy Services Association (2013).
[25] Digital Media and Learning Competition (2013b).
[26] Digital Media and Learning Competition (2013).
[27] Lerman, B. (2012).
[28] Carey, K. (2012); Meinke, B. (2012); Levine, P. (2011).
[29] Bombeneck, E. (2011); Grant, S. (2011).
[30] Maney, D. (2012).
[31] Guzdial, M. (2012).
[32] Ash, K. (2012); Battisoni, R. and Longo, N. (2012); Young, J.R. (2012); Duncan, A. (2011)

out-of-school time learning, workforce training and others. The supporters argue that digital badges have the potential to increase motivation with a reward structure that recognizes accomplishment throughout the learning process.[33] Consistent and visible feedback is linked to improved intrinsic motivations to learn and teach which also are seen as positive outcomes of a badge-driven assessment system; ideally, they would lead to peer-learning communities in which everyone (not just the official teacher) helps to educate and assess.[34] Digital badges create a mechanism for recognizing learning in multiple locations and environments. Ideally, a badge-driven assessment system could piece together formal classroom learning, work-skills development, and individual knowledge and experience allowing the learner to see their accomplishments in a more holistic manner.[35] Digital badges allow for a greater diversity of skills and knowledge to be recognized. In particular, soft skills and non-cognitive intelligences (e.g. emotional, kinetic) that are not well-integrated or recognized in current formal learning environments[36] may find a place within an expanding learning ecosystem fueled by digital badges. This includes efforts to promote civic skills, knowledge, and dispositions.

By opening up the system for demonstrating skill and knowledge to a wider range of entities beyond traditional sites of learning such as classrooms, universities, and colleges, a digital badge system could potentially signal that any place can be a site for learning.[37] The skills and knowledge gained in nonprofit settings, workforce trainings, and past experiences could conceivably be codified and recognized through a digital badging system. This learner-centered approach has the potential to accommodate multiple learning styles, interests, and preferences. In particular, such a system could allow for multiple entry points into learning and skill pathways.[38] As learning moves outside of classrooms and teaching expands beyond the instructor, there may be new opportunities for peer -to-peer learning and other horizontal interactions that are difficult to achieve in more traditional learning configurations.[39]

For civics, digital badges promise several additional advantages:

1. Civics currently faces a dilemma: it is not part of most states' high-stakes testing regimes, and so it is often a low priority, especially in schools with high failure rates on standardized tests. Adding a new test puts additional strain on those schools, and threatens to raise the dropout rate, but to leave civics untested consigns it to marginal status. Digital badges address that dilemma by offering a new way for students and schools to succeed, without erecting a new barrier to obtaining a high school degree.[40]

[33] Hickey, D. (2012); Lerman, B. (2012).
[34] Meinke, B. (2012); Grant, S. (2011).
[35] Ash, K. (2012); Carey, K. (2012); Duncan, A. (2011).
[36] Carey, K. (2012); Young, J.R. (2012); Duncan, A. (2011); O'Shaughnessy, L. (2011)
[37] Carey, K. (2012).
[38] Ash, K. (2012).
[39] Meinke, B. (2012); Grant, S. (2011).
[40] Levine, P. (2012).

2. Most policy reforms that aim to strengthen civic education require new standardized tests, curriculum standards, or course requirements. None of these have proven to be effective tools for encouraging schools to offer engaging, empowering, and challenging civic education.[41] Instead, these reforms tend to drive attention to relatively basic factual knowledge of the kind that is measured on standardized tests. Digital badges could encourage schools to offer, and students to expect, more interactive learning experiences.

3. Many young people do not obtain college degrees—or even high school diplomas—yet they have advanced civic skills that could lead to jobs or unpaid leadership positions in their communities, if there was a way to recognize those abilities.[42] At the same time, it is perfectly possible to obtain an academic degree without having civic skills. Hence, individuals can be overlooked for positions involving service and leadership despite their skills, or can be hired for those roles even though they are not prepared. By awarding digital badges for civic skills, we would allow prospective employers and community groups to identify more appropriate workers and volunteers. That could address the profound and growing gap in civic engagement by social class.[43]

4. Civic skills are not fully separable from skills obtained in other academic disciplines.[44] Being able to write and speak well are important civic skills that can be learned in English class or in drama club, as well as in social studies class. Likewise, being able to make decisions in a group is relevant to a science lab, a service club, or civics class. But the specifically *civic* dimensions of these skills are often neglected. Students may learn to communicate, but not about political or civic issues; they may learn to make decisions in groups, but not about community problems. Awarding badges for civic skills would draw explicit attention to the civic dimensions of these skills.

Critiquing digital badges

Critics of digital badges raise practical and theoretical objections. Some of these critics are from within established educational institutions that potentially have the most to lose from systemic shifts. Others come from more cultural and radical camps questioning the role of education and learning within the larger society. These critics are concerned that digital badges promote atomized, decontextualized learning,[45] which risks further transforming knowledge acquisition into a consumable commodity, rather than a developmental process.[46] As the critical scholar Alex Reid wrote on the blog *Digital Digs,* referring to an Open Badges[47] white paper:

[41] Lopez, M.H., Dautrich, K, and Yalof, D., and Levine, P. (2009).
[42] CIRCLE (2012).
[43] NCoC, CIRCLE, Mobilize.org and IOP (2013).
[44] Kirlin, M. (2003).
[45] Watter, A. (2011); Hickey, D. (2012) – sharing a comment from Nora Sabelli.
[46] Carey, K. (2012); Lerman, B. (2012); Alexander, B. (2011); Reid, A. (2011); Watter, A. (2011).
[47] The Mozilla Foundation and Peer 2 Peer University (2011).

> It offers these nice little vignettes about folks who have pursued their interests outside of traditional educational/credentialing institutions[,] but would now want those experiences to count. And let's be clear. That's what this is about: *making things count*, commodifying life and passion in the context of a marketplace of education and expertise. [48]

Some educators see K-12 schools and colleges and universities as holistic learning environments: durable communities characterized by values and norms, and guided by a comprehensive conception of the educated person. A liberal education, for example, is supposed to develop free and responsible citizens, not just graduates who have obtained a sufficient number of course credits or mastered a set of skills. Digital badges might prompt companies and other organizations to offer skills *à la carte*, thereby undermining the market for schools and colleges that offer coherent learning environments. In a sense, a diploma or a degree is a badge, but it is supposed to mark the completion of an educational experience that is worth more than the sum of its parts.

Others are concerned that badges will be awarded without any real demonstration of skill or knowledge[49] and are simply a lot of "flash"[50] in an increasingly "gamified"[51] educational system.[52] Critics reject the proponents' claims that digital badges would enhance intrinsic motivations to learn, and argue instead that they may structure learning to such a degree that individual inquiry or desire for knowledge is squelched.[53] There are also those who see an over-emphasis on "skills" – proficiencies that, once acquired, can be repeated with little or no reflection - rather than "knowledge" - actively constructed extensions of cognition that alter the relations of the self both to the world and itself.[54]

Digital badges also pose a host of technical and implementation challenges.[55] Issues around validity, credibility, and reliability have led to fears that digital badges will be meaningless electronic icons.[56] Who should be able to distribute and award badges? Should the system be open, or should entities conferring badges themselves be certified or credentialed? Transportability of these digital artifacts across multiple platforms is also a challenge. In fragmented learning and technological environments, how can badges earned in one location move to another? What are the ways in which learners might want to share, organize, and display their knowledge, and how can a system be designed to support multiple configurations? Who will control the code and infrastructure of badging systems, and how might a set of agreed-upon protocols be

[48] Reid, A. (2011).
[49] Lerman, B. (2012); Lewin, T. (2012).
[50] Young, J.R. (2012).
[51] Gamification is adding elements of games (e.g., rewards, competition) to non game environments.
[52] Ash, K. (2012); Dorn, S. (2011).
[53] Ash, K. (2012); Lerman, B. (2012); Grant, S. (2011).
[54] Lerman, B. (2012); Young, J.R. (2012).
[55] Alexander, B. (2011); Watter, A. (2011).
[56] Lewin, T. (2012); Meinke, B. (2012) – recounting presentation by Marc Lesser; Meinke, B. (2012a); Alexander, B. (2011).

developed in an open manner that would support the diverse settings and situations in which badges might be offered? Finally, there is a "need for specific data and details about why and how the badge was earned, so that anyone viewing it will have a clear understanding of the competencies of the badge owner."[57] How might employers and educators make sense of the plethora of badges presented to them by potential job candidates and students?[58] As Steve Nelson notes in a comment to a post by Sheryl Grant on the HASTAC blog, "Digital badges need to be contextualized for the reviewer, otherwise they become so much white noise."[59] Others note that traditional grade point averages and transcripts can suffer the same fate.[60]

Table 1. Arguing for and against digital badges

Proponents	Critics
Activates individual's motivation to learn	Dampens individual's motivation to learn
Creates greater flexibility to recognize a range of skills built on the way to larger mastery	Atomizes and decontextualizes learning
Allows learner to piece together a range of skills and abilities gained in multiple environments	Creates a confusing and overwhelming array of badges that don't adequately communicate skills or knowledge
Recognizes new skills and knowledge currently not recognized within formal credentialing systems	Turns learning into a commodity rather than development process
Fosters learning in a diverse set of locations and situations	Inability to compare same badge offered in two very different locations
Opens up credentialing system to new players	Lack of authority and trust creates unreliable and invalid credentials

Where to now?

It is important to keep in mind that the digital badge is part of a larger learning and assessment ecosystem. Those who support and critique digital badges place their arguments within this context. They also merge the credentialing mechanism, the digital badge, with a specific type of learning environment, usually technology or network enabled – a "networked learning ecosystem."[61] Core issues expressed in this debate (e.g. the impact on motivations, technical barriers, confused coordination) are in the early stages of exploration and experimentation. The lack of a unified technical system for digital badges is being addressed through the creation of an open badge

[57] Ash, K. (2012).
[58] Young, J.R. (2012); Nelson, S. (2011).
[59] Nelson, S. (2011).
[60] Speary, P. (2007, p. 71).
[61] Hickey, D. (2012).

infrastructure (OBI).[62] Lead by Mozilla, the OBI operates in the traditions of other open source software (OSS) projects,[63] and is currently in its "beta", or feature testing, phase.[64]

Concerns about motivational impacts seem to be mainly about the "networked learning ecosystems" that would benefit from a digital badge credentialing system. Richard Mills, a doctoral student in statistics at Lancaster University in Great Britain, was recently awarded a Digital Media and Learning Competition research prize explicitly to study the motivational effects of badges.[65] Mills joins a number of other scholars looking at motivational structures and learning dynamics present in these new environments. [66] In addition to motivations, these scholars are exploring connectivity amongst learners (e.g., peer learning, communities of practice),[67] autonomy and agency,[68] and the mechanisms by which learning is promoted.

Regardless of the technical implementation of the credential or the learning environment contours, it would seem that the key to the adoption of digital badges is the assessment system and its accompanying sphere of social support and understanding. The digital badge conversation is happening just as educational reformers are looking for credentials to measure something more than just "seat time."[69] For instance, digital badging appears to be complimentary to efforts to promote competency- based learning and assessment[70] that focus on the demonstration of mastery and applied learning in areas such as: "creativity, problem solving, and communication…include[ing] personal skills such as perseverance, cultural competency, and study skills."[71]

For scholars like Dan Hickey, consideration of digital badging assessment structures might even lead to new "paradigms of assessment" (e.g., peer validated badges)[72] that re-configure the dynamics between learner and teacher, and expand notions of what it is to be in learning communities.

How do we know what digital badges mean?

Essentially, the digital badge is a credentialing system. Just like a degree, certificate, letter grade, transcript, or report card, a badge is a mechanism to communicate a set of skills and knowledge gained.[73] However, the cultural understanding and context of what it means to have a digital badge in (say) "deliberative dialogue" is not yet solidified, shared, or widely understood.

[62] Open Badges (2013).
[63] Open Source Initiative (2013). Open source software (OSS) provides software developers with access to software code running applications. The copyright holder provides a range of rights to view, change, and distribute the code to others and often allows for many code developers to work in a decentralized, collaborative and public way.
[64] Github (2013).
[65] Digital Media and Learning Competition (2013a).
[66] Hartnett, M. (2012); Tschofen, C. and Mackness, J. (2012); Weberg-Vina, E.L. (2012); Williams, R. et al. (2011).
[67] Tschofen, C. and Mackness, J. (2012); Williams, R. et al. (2011).
[68] Hartnett, M. (2012); Tschofen, C. and Mackness, J. (2012).
[69] Nagel, D. (2011).
[70] These efforts are also called "proficiency-based" or "performance-based".
[71] Patrick, S. and Sturgis, C. (2011), p. 6.
[72] Hickey, D. (2012).
[73] Bembeneck, E. (2011).

Commenting on the blog *Ada Play* to a post about digital badges, John Carter McKnight wrote:

> *Any* evaluation system only works when (a) the evaluation outcome is clearly tied to the evaluation process, (b) that process is transparent to outsiders and (c)[is] generally [understood to be] legitimate. It also helps if (d) the evaluating body has a monopoly or near-monopoly on the field of evaluation: i.e., there aren't competing and contradictory systems.[74]

Under this scheme, trust in the validity and reliability (i.e., legitimacy) of digital badges can be built through the transparent use of assessments that have been proven to measure specific civic learning outcomes. Luckily, researchers and educators have developed well-defined and shared civic learning outcomes.[75] This growing body of scholarship may suffice to meet McKnight's criterion "d," even if a single evaluating body or monopoly is not precisely in place. Digital badges thus provide proponents of civic education with an opportunity to leverage their research and practical experience by codifying these civic learning outcomes into tangible credentials.

The challenge is to understand how best to assess civic knowledge, skills, and dispositions. Reliable and standardized civic measures are already part of the National Assessment of Educational Performance (NAEP), which regularly tests nationally representative students in grades 4, 8 and12.[76] Such measures are easy to integrate into classrooms and transparent to report.[77] While such assessments would appear to do well in assessing basic factual knowledge related to civics, there are those, including CIRCLE, who doubt their true effectiveness. Critics question whether if paper and pencil examines could ever really capture civic knowledge, especially advanced understanding.[78] Others point to the atmosphere created by high-stakes testing in subjects such as math and reading that focus on "passing" exams rather than meaningful learning.[79] There are also concerns that standardized tests may widen achievement gaps and dampen learning for low-income or minority students.[80]

It is possible that basic civil knowledge can be assessed with standardized tests. However, advanced knowledge, civic skills, dispositions, and attitudes are developed through contexts of "doing" or "experiencing," such as service, problem-based, project-based, and place-based approaches.[81] Therefore, the kinds of assessments used within those pedagogical environments are likely to hold insights into how best to assess civic efficacy in these areas.

Digital badges might be particularly useful as part of a formative assessment process, providing constant feedback and tracking of what has been learned and what the next

[74] Ibid.
[75] Zaff, J. (2010); AACU (2007); Post, M. (2004).
[76] National Center for Education Statistics (2013); Levine, P. (2013).
[77] Brindley, G. (2001).
[78] O'Leary M. and Sheil, G. (1997).
[79] Levine, P. (2011): International Reading Assessments (1997).
[80] Hanuseck, E.A. and Raymond, M.E. (1999).
[81] Wurdinger, S.D. and Carlson, J.A (2010).

step might be.[82] A drawback of formative assessments is that they take time.[83] However, strategies like peer review, interactive games or simulations, and self-administered tests might help in decentralizing assessment processes, while still providing essential feedback to the learner along the way. Also, as markers or benchmarks of learning, it is possible that digital badges might work particularly well for individuals who are stressed by testing, and for educators looking for mechanisms to accommodate differentiated learning pathways.

Hickey and Zuicker write:

> This evolution in assessment research demonstrates how the dichotomy between 'formative' classroom assessments and 'summative' external tests has given way to a more nuanced appreciation of a range of educational practices. For many researchers the formative/summative dichotomy has been replaced by a consideration of intended assessment purposes . . . and a continuum of formality that ranges from very informal observation to highly formal achievement tests . . .[84]

What else should we be considering?

Performance-based activities such mock debates, letter writing campaigns, and group projects can also be used to assess students' mastery of both skills and knowledge. These could be supplemented by other classroom-based assessment and teacher observation. Washington state has detailed a set of performance-based assessments for educators in the K-12 social studies arena.[85] At the post-secondary level, Washington State University's Critical Thinking Project developed "a seven dimension critical thinking rubric derived from scholarly work . . . and local practice and expertise . . . [using] a six-point scale for evaluation."[86] The WSU critical thinking rubric was used across the institution, and allowed for adaptation to multiple disciplinary, teaching, and instructional environments, with over 80 faculty trained to be critical thinking evaluators.[87]

In the realm of civics, the Association of American Colleges & Universities has recently developed and promoted a value rubric on civic knowledge and engagement as part of its Liberal Education and America's Promise (LEAP) initiative.[88] This rubric, like those used in Washington, has granularity for both assessment and curriculum design,[89] and could provide the foundation of a well-formulated badging system. Additionally, the WSU example demonstrates that the assessment structure underlying the credentialing system, along with adequate training in its use and design, are important elements for success. However, these non-standardized assessments still have the potential for bias

[82] Ibid, p. 102.
[83] Kelly-Riley, D. (2007), p. 30.
[84] Hickey, D. and Zuiker S.J. (2012).
[85] State of Washington Office of Superintendent of Public Instruction (2012).
[86] Kelly-Riley, D. (2007), p. 36.
[87] Ibid., p. 40.
[88] AAC&U (2007).
[89] Ibid.

and uneven implementation, even if training is provided.[90] Yet the large-scale implementation of the International Baccalaureate (IB) program[91] across 2,000 schools and 130 countries, which has "develop[ed] strategies for ensuring the standardization of both teaching and teacher-graded testing,"[92] shows that reliable assessments that move beyond standardized testing are possible. However, the cost to implement and monitor such assessment schemes may still be prohibitive for some.[93]

The potential variability in non-standardized assessment schemes might be helped by transparency and the creation of a larger context for demonstrating learning. Electronic portfolios (e-portfolios) are one mechanism that would allow for a more contextualized understanding of an individual's skills and competencies. An e-portfolio is a collection of electronic artifacts (e.g., images, text, motion and interactive media) compiled and shaped to demonstrate a set of abilities, skills, and/or knowledge.[94] Physical portfolios have a long tradition in creative fields such as fine arts, marketing, and graphic design. Their electronic counterparts are increasingly being used in job seeking, formal learning environments (i.e., elementary schools to colleges and universities), and even as demonstrations of institutional competence (e.g., accreditation, strategic planning).[95] Research on e-portfolios has shown that those who compile such knowledge artifacts improve in a range of skill areas, from critical thinking to communication of competencies to self-assessment.[96]

In a recent presentation on e-portfolios,[97] Patrick Green and Ashley Kehoe from Loyola University showed how developmentally targeted learning outcomes were integrated across campus as an interdisciplinary, multi-year endeavor woven together through an e-portfolio system. Like the WSU critical thinking rubric, the e-portfolio system was the mechanism used to implement a "standards-based" approach to the demonstration of applied learning in real world contexts where students encountered complex problems. Both Green and Kehoe indicated that system was used to support faculty and students in a range of contexts and learning activities, demonstrating competencies and making them visible.[98] The system complemented existing efforts without replicating or replacing them.

E-portfolios are a way to showcase knowledge and skills obtained through a distributed learning model, within multiple learning environments. The state of Tennessee now includes digital or e-portfolios as part of the mandated Project Citizen program.[99] Combined with well-crafted rubrics and learning outcomes, and supported through solid

[90] Brindley, G. (2001); Brown, J.D. and Hudson, T. (1998).
[91] Internatonal Baccalaureate Organization, (2013).
[92] Silva, E. (2009), p. 633.
[93] Ibid., p. 634.
[94] DiMarco, J. (2006).
[95] Lorenzo, G. and Ittleson, J. (2005).
[96] Chau, J. and Cheng, G. (2010); Beck, R.J., Livne, N.L, and Bear, S.L. (2005); Lorenzo, G. and Ittelson, J. (2005): Woodward, H. and Nanlohy, P. (2004)
[97]Loyola Univeristy and AAC&U (2013).
[98] Loyola University (2013).
[99] Tennessee Center for Civic Learning and Engagement (2013).

teaching strategies, e-portfolios could add depth to a digital badge system.[100] The Civic Minded Graduate initiative at Indiana University-Purdue University Indianapolis is using rubrics, e-portfolios, and self-reported data to demonstrate the possibilities of assessing civic competencies.[101] Well-aligned learning outcomes, teaching strategies, assessment protocols, and learning demonstrations also create opportunities for new technologies. Open and transparent communications systems could provide a set of clear markers and meaningful context that would help multiple stakeholders (teachers, employers, parents, students) understand the knowledge and skills mastered as part of individual learning pathways.

Likewise, new strategies such as games, simulations, and problem-based learning scenarios that combine learning and assessment are worthy of consideration.[102] Problem-based learning (PBL) can enhance learning motivation by putting the acquisition of core skills within real-world contexts. Gaining strong support over the last thirty years, PBL has been used with a variety of learners and contexts across disciplines, and has been shown to support the development of applied knowledge.[103] One example is a civics math curriculum that used social concerns like race, gender, wealth, poverty, and teen issues to support data analysis and computational skills.[104] Digital badges and other distributed assessment and credentialing systems would be able to recognize the multiple skills learned in a class like this that spans disciplines or may incorporate several learning environments.

Computer-based games have been shown to improve learning motivation[105] and can lead to more complex thinking skills (e.g. strategy, planning, and management).[106] While working to build core civic knowledge, civic-oriented games such as those produced by iCivics[107] have also been shown to boost academic skills like writing.[108] Community-oriented participatory games like Community PlanIt[109] and urban planning using virtual worlds like Second Life[110] have the potential to provide learners with new insights and experiences that can lead to the development of a deeper set of civic skills and dispositions, as well as increase knowledge about a particular community. Here digital badges could be used within the context of the game to mark progression, or could be awarded upon completion of the game or exercise. In both instances, badges would be a small part of a much larger learning and development journey.

[100] Digital Media and Learning Competition (2013a). In fact, the faculty writing prize from the 2012 Digital Media and Learning Competition went to Darren Cambridge at the American Institutes for Research for his book *Eportfolios for Lifelong Learning and Assessmen*t
[101] Steinberg, K.S. (2011).
[102] Silva, E. (2009).
[103] Hung, W., Jonassen, D.H. and Lui, R. (2008).
[104] Vatter, T. (1994).
[105] Kovacevic, M. (2013).
[106] De Aguilera, M., and Mendiz, A. (2003).
[107] iCivics (2013).
[108] Kawashima-Ginsberg, K. (2012).
[109] Community PlanIt (2013).
[110] Thomas, D. and Hollander, J. (2010).

Additionally, massive online open courses (MOOCs)[111] and e-assessments[112] can be used to deliver content at scale, while providing structured points for formative assessment, connections to learning communities, and new possibilities for strengthening individual agency in the learning process.[113] Such environments might leverage self- and peer-assessment,[114] again as part of formative processes.

Potential next steps for civics

Digital badges are one piece of a much larger set of possibilities presented by open education perspectives and technologies. While at times digital badges are conflated with technology-enabled learning, they can easily be used to recognize learning in a variety of environments—formal and informal, virtual and real. This fluidity may be well suited to the assessment of civic knowledge, skills, and dispositions which are often gained across multiple locations, learning experiences, and time periods. What the digital badge and alternative assessments bring to the foreground is the idea that learning, assessment, and credentialing are more than single tests or markers of success. Rather, they are part of an increasingly rich and deep set of practices and options available to those invested in education and learning. Scholar Dan Hickey writes:

> I now think that the exponential rate of change in networked learning ecosystems will transform education and learning in such profound ways, and that these transformation will allow some and force others to transcend traditional paradigms for assessing, motivating, credentialing, and evaluating learning. [115]

The technical specifics of creating, awarding, displaying, and sharing digital badges appear to be well underway with Mozilla's Open Badge project. These mechanics are being further worked out by demonstration projects like those participating in the Digital Media and Learning Competition. So it would seem that building a digital badge system for civics would largely entail creating active and engaged dialogue on what civic learning outcomes are and what they look like. In order be consistently understood and to build contextual meaning, these outcomes would need to provide as much detail, or granularity, as possible to ensure that the digital badge offered for "group facilitation" in a high school history class is roughly the same as that offered by the grassroots community organization in another state.

[111] MOOCs create a networked learning environment that connects often thousands of individuals in a focused yet open learning endeavor. This short video, entitled "What is a MOOC?" by scholar David Cormier, is helpful in explaining the term - http://www.youtube.com/watch?v=eW3gMGqcZQc

[112] An e-assessment may incorporate "e-testing, e-portfolios or simulation software. Most of the e-learning software platforms incorporate this kind of tools, such as multiple choice tests (MCT) or short-answer questionnaires. This type of test allows automatic marking, which saves lecturers' time . . . and provides immediate feedback to students." – Mora, M.C. et al (2012), p. 734.

[113] Hickey, D. (2012).

[114] These types of assessments are also being explored by the digital badge community. The Digital Media and Learning Competition awarded one of its 2012 Research prizes to Reginold Royston and Ashley Ferro-Murray, both of UC Berkeley, for a project entitled "Who's Achievement? Evaluating Self-Constructed and Peer-Evaluated Badge Systems in Online Classrooms."

[115] Hicky, D. (2012).

As credentials, digital badges leave open how civic skills, knowledge, and dispositions are taught and assessed. Multiple teaching strategies can adapt learning to the content and learning style of the individual student or particular learning environment. Existing efforts within state curriculum frameworks, disciplines in higher education, and civic sector agencies could be integrated. A diverse assessment regime that includes everything from standardized tests to essays to demonstration of skills to interactive games and simulations is possible. Best practices for both teaching and assessment for multiple environments would help support the effort.

Creating a dynamic and open space, not unlike many open source software projects, could provide continual dialogue and feedback on what is working and what isn't, and promote minimum standards. Thus a digital badging effort in civics would look a lot more like building the cultural consensus of civic education, and a lot less like a standardized SAT in civics.

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CIRCLE (The Center for Information and Research on Civic Learning and Engagement) conducts research on the civic and political engagement of Americans between the ages of 15 and 25.

It is based at the Jonathan M. Tisch College of Citizenship and Public Service at Tufts University.