Digital Badges for Capturing, Recognizing, Endorsing, and Motivating Broad Forms of Collaborative Learning

Daniel T. Hickey, Christopher D. Andrews, Grant T. Chartrand
dthickey@indiana.edu, andrewch@indiana.edu, gchartra@indiana.edu
Indiana University

Abstract: Traditionally, schools have measured, compelled, credentialed, and accredited *achievement.* The practices for doing so are opaque, analog, expensive, inefficient, and entrenched. This makes schools resistant to embodied, enactive, extended, and embedded collaborative learning. Digital badges can contain (a) specific claims about such broad learning, (b) web-enabled digital evidence supporting those claims, and (c) information about how that evidence was obtained. Badges can then circulate this information readily in social networks where they can gain additional meaning. This paper explores how CSCL goals might be served by using badges to shift towards capturing, recognizing, endorsing, and motivating *learning,* and doing so for a much broader range of learning than otherwise possible.

Open digital badges are a new kind of credential that were introduced in 2012 in an initiative of the MacArthur Foundation. The *Badges for Lifelong Learning* competition was introduced by the US Secretary of Education and was widely reported. The initiative supported 30 efforts to develop digital badges for diverse educational programs and the Open Badges metadata standards that allowed digital badges to become *interoperable* and *extensible.*

Despite significant interest among others, digital badges have received little attention in Learning Sciences venues (i.e., Davis & Bell, 2016; Hickey & Chartrand, 2018; Tran, Schenke, & Hickey, 2014) and apparently have never been represented in a CSCL venue. Some skepticism towards digital badges likely follows from their conflation with *gamification* (e.g., Duncan, 2011), *competency-based education* (e.g., Metzger, Lubin, Patten, & Whyte, 2016) and *extrinsic incentives* (e.g., Resnick, 2012). This paper argues that digital badges need not be used in these ways, and that doing so obscures their significant untapped potential for supporting the broader participatory and collaborative learning that is valued in the LS and CSCL communities, and supporting the embodied, enactive, extended, and embedded learning that is the focus of CSCL 2019. This is because badges can contain broad evidence of learning along with detailed information about how that evidence was obtained, and do so in a way that allows viewers who are interested and willing to interrogate this information

Four potentially transformative functions of digital badges

This paper is organized around the four potentially transformative functions of digital badges. It illustrates these functions using a badge system that was designed within a "Big Open Online Course" on Educational Assessment that was completed by hundreds of students over three years. This badge system was designed to take advantage of key features of Open Badges while exploiting the potential synergy between badges and digital portfolios. With funding from Google and using Google *CourseBuilder*, the "Assessment BOOC" used *expansive framing* (Engle et al., 2012) to support participatory collaborative learning at scale.

From measuring achievement to capturing learning

The first set of potentially transformative functions associated with digital badges concerns *assessment*. Much of the evidence that badges might contain is generated by typical classroom assessments, such as quizzes, performance assessments, portfolios, etc. While badges might also include scores from formal standardized achievement tests, scores on such tests typically can "speak for themselves" and therefore are ill-suited for badges.

Capturing richer evidence of the context of the learning

The *Assessment Principles Expertise* badge, which one student earned by completing the second module in the BOOC included links for each of the three "wikifolio" activities that were completed, including the prompts for each element and response to each prompt (Endnote 1). This allows badge viewers to "drill down" into this information without getting lost; the information in the badge and the annotations on the hyperlinks help viewers know what they are clicking on and how it relates to the competencies asserted in the criteria of the badge. For the interested viewer, even more information about the learning context can be accessed from those links. All this information can make the actual "evidence" more meaningful to badge viewers who value this information.

Capturing evidence of broader learning

The Expertise badge mentioned above states that the earner scored over 80% on the module exam. These were rigorous time-limited exams that included "best answer" items that were difficult to look up in the allocated time. Meanwhile, the linked wikifolios reveal both the prompt and the response to three reflections that provide evidence of *consequential engagement* (Gresalfi, Barab, Siyahhan, & Christensen, 2009). Arguably, this additional information provides stronger support for proficiencies claimed in the badge. In this way, badges are a promising response to the problem of CAMEO cheating (*Copying Answers from Multiple Existences Online;* Northcutt, Ho, & Chuang, 2016) that plague MOOCs. In situations where the value of the badge was very high, such nuanced evidence may be quite valuable. It is worth noting that several students at other universities were able to use their BOOC badges as evidence for earning "independent study" credits.

Capturing evidence of collaborative learning

The first proficiency listed in the Expertise badge is *Productively discuss classroom assessment principles with professional peers.* Illustrating how badges address a crucial challenge in assessing collaborative learning, the badge provides further evidence of this collaborative competency *by the number and nature of comments on the individual wikifolios.* Rather than formally assessing representations of collaboration, these assertions and representations of collaboration allow viewers *for whom this evidence has value* to examine the evidence themselves and to do so in a manner that is commensurate with the viewers' value of the claims and evidence.

Capturing evidence from open learning pathways

Learners who earned all three module badges in the Assessment BOOC were issued an *Educational Assessment Expertise* "metabadge" that contained hotlinked images of the three module badges (Endnote 2). This is an example of an "open learning pathway" introduced by Otto (2017) and formalized in the most recent Open Badges 2.0 Specifications. Such arrays offer useful pathways *into* learning as well as *during* learning, by capturing evidence of accomplishment of smaller goals that are still meaningful.

From credentialing graduates to recognizing learning

While related to the capturing aspect, digital badges also serve distinct functions associated with the *recognition* of learning. Recognition functions correspond more with credentialing practices associated with assigning grades and awarding certificates and degrees. Recognition functions are particularly relevant when using badges to catalyze broader transformations of educational ecosystems considering the broader functions of credentials (i.e., *human capital*, *screening & filtering*, *signaling*, *control*, *cultural capital*, *institutional*, and *credentialism;* Bills, 2003). The following recognition functions can be considered apart from the capturing, motivating and endorsing, which in turn helps reveal the complex but important interactions between these functions.

Recognizing learning openly

Some have raised concerns over open recognition with badges and the corresponding lack of traditional security measures (e.g., Mathews, 2016). This is presumably because the transformative potential of open recognition is not readily obvious to many observers. In response, the *Bologna Open Recognition Declaration* asserted that "Open Badges, the open standard for the recognition of learning achievements has proved the power of a simple, affordable, resilient and trustworthy technology to create an open recognition ecosystem working across countries, educational sectors, work, social environments and technologies" (Open Recognition Alliance, 2016). The anthropological notion of *boundary objects* illustrates the potential of open recognition. Boundary objects are produced in one context but can be used in other contexts by other people, for different purposes. Consider, for example, that the same badges that an instructor might issue in a course can also be shared by the earner on their Facebook or LinkedIn account. The instructor might "stack" that badge into a learning management system (by recording the URL of the badge) and associate it with a grade and private feedback (information which must be strictly protected). But that same badge might also circulate publicly in the earners social networks where it gains "likes" and comments, which give the badge further and different meanings.

Recognizing a broader range of competencies

Badges are well-suited for recognizing so-called "21st Century" competencies associated with networked digital learning. Such highly contextual competencies are difficult to assess and even harder to measure in standardized ways. The ability to recognize broader competencies has previously been ascribed to ePortfolios (e.g., Gibson & Barrett, 2002) and even earlier with portfolio assessment. Unfortunately, objective studies have shown that portfolios alone often fail to serve intended formative and summative functions (e.g., Lam, 2017). The obvious question is whether the combination of ePortfolios and digital badges has the potential to overcome the challenges of recognizing the broader range of CSCL competencies. Including threaded discussions contained in the BOOC

badges along with information about the context in which those discussions occurred make it possible to recognize collaborative learning in ways that otherwise would be quite difficult.

Recognizing a broader range of proficiency of a competency

Traditional credentials are hard-pressed to recognize the range of proficiency for given competencies beyond grades, grade point averages, and honors achievements. For the same reasons that badges can recognize a broader range of competencies, badges can also recognize a broader range of proficiency for a specific competency. The BOOC module badges and the learning pathways discussed above provide one example of how digital badges facilitate the recognition of broader range of competency. This function was also exemplified by the way that earning a passing score on the final exam transformed the *Educational Assessment* badge into the Educational Assessment *Expertise* badge. This recognition potential is particularly relevant for highly contextual "21st Century" competencies. This is because an individual's level of proficiency with these competencies is ultimately recognized in terms of the nature and number of contexts in which such competencies are demonstrated. Some viewers of the badge might find the number of comments on each wikifolio to be enough evidence of this competency; others might click on the links and examine discussions. This recognition function is particularly significant when combined with the endorsement functions described below.

Recognizing opportunities for learning

Another important function of digital badges is helping *potential* learners recognize opportunities to learn. In the case of the Assessment BOOC, badge earners were strongly encouraged to share their badges over Facebook, LinkedIn, Twitter, and any relevant interest-driven professional networks; those badges invited viewers to submit their email addresses and place themselves on the distribution list. Additionally, clicking on the course URL on the first line of each badge took the viewer to the course homepage, which included a link that allowed new learners to enroll in the course. The course survey confirmed that some learners discovered the BOOC this way.

From compelling achievement to motivating learning

Space limitations preclude full discussion of the many complex ways badges might motivate learning. To reiterate, some have characterized badges as "extrinsic incentives" which undermine intrinsically motivated learning. This rekindled debate over extrinsic incentives is discussed at length in a new handbook chapter (Hickey & Schenke, 2019). That chapter argues that: (1) digital badges are inherently more meaningful than grades and other credentials, (2) circulation in digital networks makes Open Badges particularly meaningful, (3) the negative consequences of extrinsic rewards are likely overstated, and (4) consideration of motivation and badges should focus primarily on social activity and secondarily on individual behavior and individual cognition.

From accrediting schools to endorsing learning

A fourth set of transformative functions associated with digital badges concerns what is traditionally associated with *accreditation,* where external "third parties" review and verify the quality of schools and programs and the achievement represented by their degrees and credentials. Existing accreditation practices are analog, opaque and intransigent (Gallagher, 2016). Arguably, traditional accreditation is an obstacle to participatory and collaborative learning in many schools. Newly available "Endorsement 2.0" standards promise a shift towards more open and transparent *endorsement* of learning (Hickey & Otto, 2017). Two Assessment BOOC features illustrate what open endorsement practices might look like.

Endorsing learning with peer endorsement

To encourage informal review of wikifolios by classmates, a *peer endorsement* feature was added to each assignment in the Assessment BOOC. Participants were asked (but not required) to endorse at least three of their classmates' wikifolios for being "complete." As shown in the Assessment Principles badge, these endorsements were tabulated on the module badge for each completed wikifolio assignment.

Endorsing learning with peer promotion

Each wikifolio assignment asked (but did not require) students to promote one (and only one) of their peers' wikifolio each week for being "exemplary." Unlike peer endorsement, students were required to provide an endorsing statement describing what made the work exemplary. These promotions were also tabulated on the module badge, while the endorsing statements are displayed on the linked wikifolio. Students clearly valued the endorsements strongly and complained when course practices made it harder for them to earn endorsements. A search feature let participants locate widely promoted peer work completed by peers with similar professional roles.

Discussion and future directions

This paper illustrated how a single digital badge system was used to capture, recognize, motivate, and endorse broad forms of conventional, participatory, and collaborative learning. We contend that these functions might be similarly useful for many other (but certainly not all) forms of CSCL. This seems particularly promising when coupled with the idea that the evidence contained in those badges could be readily examined in light of the claims made by those same badges in order to examine the effectiveness of the larger learning-assessment ecosystem. Innovators in the CSCL and LS communities and beyond are encouraged to consider adding digital badges to their efforts and exploring the transformative potential of the functions introduced here.

Endnotes

(1) https://eabooc.appspot.com/badges/evidence?id=15102006
(2) https://eabooc.appspot.com/badges/expert_evidence?id=11022008

References

Bills, D. B. (2003). Credentials, signals, and screens: Explaining the relationship between schooling and job assignment. *Review of Educational Research*, *73*(4), 441-469.

Davis, K., & Bell, A. (2016). *Co-designing a digital badge system: Supporting learners' science identities through participatory design*. Symposium presented at the International Conference of the Learning Sciences, Singapore.

Duncan, A. (2011, September 15). *Digital badges for learning: Remarks by Secretary Duncan at the Launch of the MacArthur Foundation's 4th Annual Digital Media and Learning Competition*. Washington, DC: US Department of Education. Retrieved from: https://www.ed.gov/news/speeches/digital-badges-learning

Engle, R. A., Lam, D. P., Meyer, X. S., & Nix, S. E. (2012). How does expansive framing promote transfer? Several proposed explanations and a research agenda for investigating them. *Educational Psychologist*, *47*(3), 215-231.

Gallagher, S. R. (2016). *The future of university credentials*. Cambridge, MA: Harvard Educational Press.

Gibson, D., & Barrett, H. (2002). Directions in electronic portfolio development. *Contemporary Issues in Technology and Teacher Education*, *2*(4), 556-573.

Gresalfi, M., Barab, S., Siyahhan, S., & Christensen, T. (2009). Virtual worlds, conceptual understanding, and me: Designing for consequential engagement. *On the Horizon*, *17*(1), 21-34.

Hickey, D. T., & Chartrand, G. (2018, June). Recognizing competencies vs. completion vs. participation: Ideal roles for web-enabled digital credentials. In the *Proceedings of the biennial meeting of the International Conference of the Learning Science*, Volume 3 (pp. *792-799*)

Hickey, D. T., & Otto, N. (2017, February 13). Endorsement 2.0: Taking Open Badges and e-credentials to the next level. *EDUCAUSE Review*.

Hickey, D. T., & Schenke, K. (2019). Open digital badges and reward structures. In K. A. Renninger, & S. E Hidi (Eds.), *The Cambridge handbook on motivation and learning* (pp, 209-237). Cambridge MA: Cambridge University Press.

Lam, R. (2017). Taking stock of portfolio assessment scholarship: From research to practice. *Assessing Writing*, *31*, 84-97.

Mathews, C. (2016, September 22). Unwelcome innovation. *Inside Higher Ed*.

Metzger, E. C., Lubin, L., Patten, R. T., & Whyte, J. (2016). Applied gamification: Creating reward systems for organizational professional development. In D. Ifenthaler, N. Bellin-Mularski, & D.-K. Mah (Eds.), *Foundation of digital badges and micro-credentials* (pp. 457-466). Switzerland: Springer.

Northcutt, C. G., Ho, A. D., & Chuang, I. L. (2016). Detecting and preventing "multiple-account" cheating in massive open online courses. *Computers & Education, 100*, 71-80.

Open Recognition Alliance (2016). Bologna Open Recognition Declaration [Webpage]. Retrieved from https://www.openrecognition.org

Otto, N. (2017, January 5). Open pathways connect badges to what you care about [Blogpost]. Retrieved from https://www.concentricsky.com/articles/detail/open-pathways-connect-badges-to-what-you-care-about

Resnick, M. (2012, February 27). Still a badge skeptic [Blog post]. Retrieved from http://hastac.org/blogs/mres/2012/02/27/still-badge-skeptic

Tran, C., Schenke, K., & Hickey, D. T. (2014). Design principles for motivating learning with digital badges: Consideration of contextual factors of recognition and assessment. In the *Proceedings of the 11th Biennial International Conference of the Learning Sciences*, Boulder CO (pp 1027-1031).