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Badging Best Practices

Kelsey L. O'Brien

By definition, a digital badge is a symbolic icon. As a visual cue, it signifies importance and prompts the viewer to investigate the full story of a particular achievement. In essence, a badge is a communication mechanism that promotes, tracks, and showcases learning.

As a symbol, however, a badge is only as valuable as the learning experience it represents. This chapter thus aims to prioritize function over form by employing Wiggins and McTighe's (2005) "backward design" model as a guiding framework, envisaging how educators might leverage the unique qualities of badges at each stage of curricular design.

The Understanding by Design (UbD) framework asserts that "the best designs derive backward from the learnings sought" (ibid., 14). Using this method, the educator must begin by considering the desired results and assessments before planning lessons, selecting materials, and determining teaching strategies. Stage 1 of the UbD process establishes expectations for what learners will be able to understand or do, while stage 2 considers the evidence that will be used to assess this understanding, and stage 3 maps out the learning activities that will prepare learners to meet the desired objectives (ibid.).

Viewed through a results-focused lens, the badge represents the learning goal set out by the educator and the driving achievement to which the learner aspires. This approach counteracts the inclination to simply append a badge to the end of an assignment or activity, which wrongfully assumes that the badge itself is inherently motivational or valuable to every learner. The badge should not simply be defined by its associated content but, rather, by the objective of the learning.

While badging in education is still in its infancy and best practices continue to evolve, backward design, or “badges first” design, has emerged as a common approach among badge practitioners, both as an explicitly stated framework (Higashi et al. 2017; Bartoletti, Seitzinger, and Kilgore, 2015; Grant 2013, quoted in Hickey and Willis 2017, 9) and in the application of related pedagogical and instructional design principles (Rimland and Raish 2018). The conceptual badge system prototype presented by Higashi et al. (2017) provides an especially comprehensive model grounded in design theory.

Following the stages of backward design, this chapter begins with guidelines on establishing the purpose of the badge or badge system before considering the supporting evidence that defines the quality of the credential and, finally, the infrastructure that will lead to the culminating achievement. The points of consideration included at each stage seek to highlight ways that librarians and other educators might thoughtfully integrate and thus maximize the unique opportunities offered by digital badging. The key points presented for each of the three stages are outlined in table 6.1, located at the end of the chapter.

STAGE 1, ESTABLISH YOUR PURPOSE

The *purpose* of the learning, according to UbD, serves as the impetus and touchstone throughout the design process. According to Wiggins and McTighe (2005), “Answering the ‘why?’ and ‘so what?’ questions that older students always ask (or want to), and doing so in concrete terms as the focus of curriculum planning, is . . . the essence of understanding by design” (15–16). Maintaining this “transparency of purpose” throughout planning and implementation helps establish, reinforce, and communicate the value of the learning experience for the educator, learners, and ultimately outside evaluators.

At the outset of the design process, the badge designer should envision the badge embedded on an electronic portfolio or a professional online profile such as LinkedIn. What might this badge mean to someone who has earned it, and what does it convey to an observer? Does the badge enable opportunities for the earner? Does it represent a competency that a recent graduate might refer to as a talking point during a job interview?

Imagine where you want the learner to be before planning the pathways they will take to get there. While there is often reluctance to label badges as extrinsic motivators, they nevertheless represent a kind of award system. A badge is akin to a flag waving at the summit or a trophy at the finish line. As an embellishment on an otherwise text-based profile or online résumé, the badge draws attention, which should prompt the badge designer to ask, What

is worthy of recognition? To establish a badge's purpose, one must consider its relevance and applicability within various contexts.

Identifying Needs

A widely circulated illustration by Bryan M. Mathers (<https://bryanmmathers.com/credentials-big-and-small/>) depicts micro-credentials such as badges as pebbles in a jar, filling in the gaps left by bigger rocks that represent traditional credentials such as college degrees. When determining the purpose of a badge or badge program, consider how badges might fill in existing gaps. This begins with identifying needs in national, community, and institutional settings. Where is there a demand for better representation of learning?

A badge can represent the answer to an established need. Chapters 2 and 3 of this volume situate badges within the broader context of higher education, considering their potential for addressing substantial challenges, pressures, and expectations of various stakeholders in the academic community. Additionally, reports such as those published by Project Information Literacy (<http://www.projectinfolit.org/>) continue to point to student frustrations and career readiness disparities that librarians can help address. In creating a badge that represents a relevant learning goal, an educator is effectively putting their stake in the ground as a resolution to strive toward solving a given problem.

When considering the potential application of a badging program, librarians need not limit their scope to library-specific initiatives but should rather consider the far-reaching capabilities of information literacy in addressing campus-wide challenges. Exploring strategic planning documents and regional accrediting agency reports may present opportunities to participate in established initiatives. Attending academic department meetings and engaging in conversations with faculty can help establish institutional and disciplinary needs.

Additionally, calls for grant proposals offer an effective gauge of local and national interests on which a badging program might focus. Along with providing start-up funding, grants can help the applicant articulate (and hopefully ultimately demonstrate) the role of the library or department in fulfilling the institution's mission or addressing a broader societal issue. While funding may focus on technological infrastructures, innovation grants often present challenges related to more expansive themes such as student success, social media ethics, and accessibility—all calls that librarians can help answer.

Existing badge programs provide valuable resources that can inspire purposeful implementation in a library setting. Interested readers may refer to case studies from this volume along with other examples from the

field documented within the following resources: the Libraries section of HASTAC's annotated research bibliography of digital badges (<https://www.hastac.org/digital-badges-bibliography>), ACRL's Digital Badges Interest Group (<https://acrl.libguides.com/digitalbadgeinterestgroup>), volume 29 (4) of the *Journal of Electronic Resources Librarianship* (<https://www.tandfonline.com/toc/wacq20/29/4?nav=tocList>), and the DPD Project's Badge Systems page (<http://dpdproject.info/>). Established badge programs can serve as models in the early stages of badge design and as reference points when discussing a potential project with administrators and in some cases may be openly licensed for reuse or adaptation. At the time of writing, current endeavors involving the development of badge repositories (see, for example, <https://badgerank.org>) suggest promising opportunities in the near future for targeted searching of the open badges ecosystem, which should assist in unearthing additional relevant programs and initiatives.

Transferability

When considering the purpose of a badge program, the badge designer must continually contextualize the badge, from its initial purpose to its ultimate applicability for the earner, in order to ensure its relevance. McTighe and Wiggins (2012) assert that the true value of learning lies in its applications beyond the classroom. Transferability, or “the ability to effectively use content knowledge and skill” is therefore a foundational tenet of the UbD framework. “The bottom-line goal of education is transfer. The point of school is not to simply excel in each class but to be able to use one’s learning in other settings” (2).

If badges are to be utilized as a kind of educational currency endowed upon the learner, they must have value outside of the context in which they are earned. While some might rightfully argue for the merits of learning for personal enrichment or enjoyment, educators should carefully consider whether a learning experience warrants credentialing in the form of a badge (though lightweight badges can play a different role, as will be discussed in stage 3). As a credential, a badge indicates that the acquired ability can be applied to other situations, such as the workplace or graduate school.

Transferable learning is performance-based, and the credibility of badges likewise operates on verified, evidence-based claims. In essence, a badge asserts that, “Using past performances as evidence . . . the earner of this badge possesses the indicated skill, and will be able to apply it appropriately and build upon it in the future” (Higashi et al. 2017, 55). To consider the purpose of the badge is thus to contextualize the potential applications of the associated learning experience.

Purposeful Badging in Libraries

As epicenters of lifelong learning and discovery, libraries promote inquiry, openness, and innovation—values that are also championed by the open badging movement. Libraries of all types, particularly academic libraries, have long since shifted their focus from knowledge repositories to service-oriented institutions focused largely on teaching vital research and learning strategies. Outside entities, however, are often unaware of the educational opportunities that librarians provide and how they can help meet established needs.

As illustrated by the following examples, there are several ways that academic library programs might meaningfully integrate digital badges to showcase teaching and learning.

Promoting Information Literacy Programs

According to the culminating report of the Design Principles Documentation Project, which followed up on the progress of the thirty pioneering badge programs funded by the MacArthur Foundation's Badges for Lifelong Learning competition in 2012, badges tend to work well as an overlay for existing programs. The report found that "badges work better where educational content already exists," partly due to the considerable workload involved when creating both new content and new technology (i.e., website and badge mechanisms) (Hickey and Willis 2017, 16).

Badge systems can enhance the structure and visibility of existing information literacy programs by illuminating, clarifying, and promoting teaching and learning that is already in practice. This can be especially valuable for librarians whose instruction is distributed across the curriculum as integrated one-shot sessions, as opposed to a designated information literacy course. Digital badges can be created as goal markers that delineate important competencies within an information literacy program; the work required to earn a badge might be assigned in conjunction with face-to-face library instruction for pre- or post-assessment or in place of in-person instruction when carefully coordinated with the instructor assigning the work (Rimland and Raish 2018). Such a badge program can provide a cohesive visualized package to disciplinary faculty members who may be unaware of the instructional opportunities librarians provide, and it can help clarify misunderstandings about what librarians do and teach.

For programs that are more formally integrated into institutional organizations, badge systems can reveal the more granular intricacies of information literacy. Badges might be used to pinpoint critical competencies assessed in an information literacy course, for example. By using more generic titles

and descriptors (i.e., critical thinking or problem-solving), badges can also be used to translate unfamiliar terminology for observers who may not fully understand what information literacy is when they read the course title on a transcript.

It is important to note that, while badges are well-utilized as a mechanism for highlighting the finer aspects of an existing course, badge designers should be wary of redundancy. If a credential or clear marker already exists (e.g., a grade or a course designation on a transcript), an accompanying “completion” badge does not necessarily present added value for the learner or an observer. In fact, these types of badges typically do not motivate potential earners who tend to perceive them as redundant with existing assessment indicators (Hickey and Willis 2017, 51). Rather, badge designers should emulate the more successful examples presented in the DPD report, in which “badges contained unique information and evidence that was not easily accessible or available elsewhere” (ibid., 19). In other words, badges can work well when carefully aligned with measurable learning goals in a course, but they should not simply replace course or assignment grades.

As eye-catching visuals, badges can make valuable marketing and branding tools that concisely and attractively communicate the goals and mission of a library or information literacy program. While the lack of a formalized program presents familiar challenges for many academic libraries, there are also advantages to starting with a blank slate, as librarian Nicole Pagowsky pointed out in the early stages of the badging movement. Integrating badges, Pagowsky says, “is difficult for libraries when trying to align with campus curriculum, particularly if information literacy is not formally integrated. However, this could present an opportunity rather than a problem by allowing a means to explicitly map library instruction to campus goals, track progress, and activate clear assessment” (Pagowsky 2013). As promotional tools, badges might accompany the mission statement on the library’s webpage, illustrate departmental goals to an administrator, or provide a visual talking point when working with a faculty member.

Communicating Learning Goals

As mentioned earlier in this section, maintaining transparency of purpose helps communicate the “why” of learning to various audiences. Along with making teaching practices evident to faculty colleagues and administrators, badges can illuminate learning for students by highlighting goals and expectations, visualizing learning processes, and helping them articulate what they have learned. Badges embedded into a course, such as those described in the section above, can illustrate and reinforce course learning goals and objec-

tives, which, while likely reviewed on the syllabus on the first day of class, are often promptly forgotten.

Using badges to “map learning trajectories” for learners and educators is one of the simplest and most achievable uses of badge systems (Hickey and Willis 2017, 34–35) and is particularly pertinent to information literacy, about which students often do not know what they do not know. Badges can put a label on critical learning processes that may be obscured for students by automated or habitual search behaviors. While students may know how to find resources for a research assignment using Google, for example, in many cases they are unaware of how to find the best resources or why doing so is important. When designed to represent desired outcomes, badges communicate the purpose of the learning to students and signal that the culminating competency is important and worthy of promotion.

Educators can also leverage badges to connect learners to their learning, shifting the focus from knowledge transfer to helping students become better learners. Viewed through a constructivist lens, which “places the focus of design on helping the student to construct their own knowledge through active learning” (Rimland and Raish 2018, 213), badges might be presented as knowledge building blocks to be collected, built upon, and displayed. As personal identifiers, badges can frame the learning as an internal process by which an achievement is *earned* rather than as an external transaction that happens *to* the learner. Akin to its physical counterpart adorned on a sash or uniform, an earned digital badge becomes an extension of the earner’s public identity.

When used to enhance awareness and understanding of learning, badges can help learners articulate what they know, doubling the function of a badge not only as a credential on a résumé but as a talking point in a job interview or graduate school application. Likewise, by enabling the ready identification of gaps in learners’ knowledge, badges may encourage learners to seek opportunities to fill them.

Unlocking Opportunities

While a badge should primarily represent the learning outcome, the value of badges may be enhanced “when they provide additional opportunities within the environment where the badges are issued” (Hickey and Willis 2017, 55). Depending on the weight of the credential, these opportunities might include internships, jobs, or peer mentor status. Hickey and Willis clarify that external opportunities need not undermine intrinsic motivation when they are tied closely to the learning experience represented by the badge: “Digital badges might be external to the *learner* but intrinsically related to

the learning *process*” (ibid., 48). In other words, the opportunity should be related to the competency as opposed to an unrelated prize or privilege (e.g., a gift card for printing or unlimited borrowing privileges).

The story recounted in chapter 4, in which a student eagerly worked toward a badge that would unlock a desired career exploration opportunity, provides an example of how these kinds of badges can facilitate goal setting. Badges can provide a meaningful target for students by encouraging them to strive toward personal learning goals and contextualizing learning activities within real-world applications. By partnering with employers or community organizations, libraries might utilize a badge program to reach students interested in a particular career track and to illustrate the value of information literacy in the workplace.

Librarians reading this volume are likely already doing a great deal in service of students, but these efforts may be hidden to outside observers. Consider how a badging program might be utilized to reveal, clarify, document, and showcase student learning. Once the guiding purpose has been established, the next phase involves authentically assessing and communicating the value of the badge to external audiences.

STAGE 2, DETERMINE EVIDENCE: HOW WILL LEARNERS DEMONSTRATE WHAT THEY KNOW?

The distinctive value of digital badges as credentials lies in their metadata, descriptive information that is encoded or “baked into” the badge image. Metadata adds dimension, helps establish the quality and validity of the badge, and tells the story of the learning that took place.

While the terms *digital badge* and *Open Badge* are often used interchangeably, Open Badges are distinguished by their metadata standards. The umbrella “digital badge” designation includes the static icons one might encounter in a video game or mobile application; Open Badges, however, adhere to the Open Badges Infrastructure (OBI), an interoperability standard established by Mozilla Foundation in 2011 and transitioned to IMS Global Learning Consortium in 2017 (<https://openbadges.org/about/>) that enables badges to be implemented and displayed across all compatible environments. OBI-compliant badge-issuing platforms such as Credly and Badgr make it simple for a badge designer, regardless of programming expertise, to create the metadata fields required for an Open Badge, including the badge description, issuer, and earning criteria.

As both a technical specification and a movement, Open Badges support and promote transparency in education. In contrast to cryptic course titles on

transcripts and vague college diplomas, Open Badges invite the reviewer to investigate the validity and meaning of the credential. Badges concisely package the competency claim with the assessment, enabling the immediate interrogation of the badge's authenticity. Digital badges thus communicate their own value, and a poorly designed badge will quickly be revealed for what it is. "An attentive evaluator would reject (with prejudice) a badge that claims one thing but measures something else, and no learner would be excited to earn a token thus discredited" (Higashi et al. 2017, 53).

While more detailed metadata strengthens the quality of the credential, however, not all badge observers will investigate beyond the surface level. The badge designer must bear in mind that the hiring manager or admissions officer may not take the time to click on the embedded badge and should accordingly include useful and efficient information at each layer. The badge image should provide a quick "visual summary" for the evaluator (*ibid.*, 56) and avoid ambiguity by including a straightforward title, while the metadata, revealed upon the first click, should provide a thorough yet concise textual description. Links to evidence, program details, and issuer credentials should be included in the metadata fields for those reviewers interested in deeper evaluation.

The following sections present points of consideration for creating metadata that communicates and verifies the quality of the badge.

Badge Claims

Higashi et al. (2017) posit that, "In essence, the entire badging enterprise—and, indeed, that of microcredentialing in general—hinges upon the question of why a viewer should believe the badge's claim" (53). The ability of any individual or organization to certify learning outside of conventional credentialing systems presents a liberating but challenging prospect for academics and employers. Detailed metadata about the issuer and supporting evidence is essential in order to validate and solidify a badge's claim.

As information literacy experts, librarians are well poised to teach and assess particular skill sets and competencies that are in high demand, such as critical thinking, media literacy, and creative problem-solving. Potential badge reviewers, however, may be unaware of an issuing library's qualifications or the robustness of an information literacy program. Links to professional credentials and department pages, along with issuer endorsements, such as Credly's verified status, can help assure a badge reviewer of the academic expertise of those developing and issuing badges. Librarians should discuss with administrators whether the badge is to be issued by the entire library, a specific department, or perhaps a dedicated committee. Badge issuers may also want

to consider partnering with larger departments or schools and branding their badges accordingly (see chapter 10 of this volume). Institution-wide badging programs such as those implemented by Penn State University provide additional affirmation by associating the credential with the reputation of the university.

By awarding a badge, the issuer stands behind the badge's claim. The claim should therefore be carefully mapped to measurable learning outcomes. Higashi et al. state that "a valid assessment makes a claim that an individual knows something, backs that claim with evidence, and leads to a conclusion that is usable for a decision" (2017, 54). Badge designers should be explicit in the competency or ability that a badge represents and may want to consider issuing an expiration date for claims that will lose their value over time (e.g., technology expertise), which enables the earner to periodically reapply for renewal.

Evidence

Evidence serves as the gauge for determining the degree to which a learner has achieved the desired results and as the primary validation of a badge's claim. By promoting authentic, performance-based assessment, badges can help shift the focus from teaching, which does not guarantee learning (McTighe and Wiggins 2012), to a demonstration of what a student has actually learned. As opposed to measuring learning by seat time, an outdated practice that is still reflected in course credits, the disruptive power of badges as credentials lies in their ability to "show versus tell."

While optional, according to OBI, evidence is one of the most valuable and transformative pieces of badge metadata. In alignment with the desired learning outcomes established in stage 1, evidence should be performance-based and demonstrate the transferability of the competency. "What will count as evidence *on the field*, not merely in drills, that they really get it and are ready to *perform with understanding, knowledge, and skill* on their own?" (ibid., 19; emphasis original).

A badge's evidence can be included as a file or a link, enabling flexibility in its format. The badge system prototype provided by Higashi et al. (2017) offers examples of four different kinds of evidence that might be included in a badge's metadata: experience (e.g., training or workshops), learning artifacts, endorsement (e.g., a written recommendation from an expert), and exams. The prototype presents the inclusion of all types of evidence as the ideal, enabling the triangulation of multiple sources to make a stronger claim about the quality of the assessment, but the authors also acknowledge that this may not always be possible (56).

The inclusion of learning artifacts as evidence presents a unique opportunity to directly align experience with competency. Rather than requiring the reviewer to sift through a candidate's portfolio to align their experiences with the desired qualifications, a badge serves as its own miniature portfolio and connects the dots for a potential employer or admissions officer.

Endorsements

Endorsements allow outside evaluators, in addition to the badge issuer, to submit their own judgment of the claimed competency, similar to a reference letter written for a job applicant. Though this feature is one of the more recent fields to be added to the Open Badges specification, initial reports from early practitioners suggest that badges are enhanced “when they can be endorsed by multiple stakeholders after they are issued, based on the evidence contained in the badge” (Hickey and Willis 2017, 38).

Higashi et al. (2017) contend that “the major strength of this evidence category is in capturing intangible, yet historically reliable, assessments of expertise by knowledgeable others within the learning space. This type of evidence is also uniquely positioned to reflect on certain types of skills that are impossible to evaluate through other means, such as collaboration quality, which is inherently social” (62). The endorsement of information literacy competencies, which tend to be easier to evaluate via observation rather than testing, could certainly help enhance and clarify the credential beyond the original badge issuer's claim. Librarians working in collaboration with disciplinary faculty to implement badges might consider having the faculty member submit a statement of endorsement or an annotated rubric that was used to assess a culminating badge assessment in order to enhance the validity of the claim.

The full realization of the endorsement feature will require buy-in from experts such as internship mentors or employers, many of whom may still be skeptical of badges. But as badges gain broader recognition, external organizations will likely be more receptive to partnerships, presenting increased opportunities for professional endorsements (Hickey and Willis 2017, 37).

STAGE 3, PLANNING LEARNING PATHWAYS: HOW WILL LEARNERS GET THERE?

The final phase of badge design involves creating the learning activities that prospective badge earners will need to complete in order to provide the necessary evidence that demonstrates the claimed competency. While badges

represent the desired learning goal, a badge system can illustrate the steps learners will take to reach that goal. Considerations at this stage revolve around scaffolding and feedback mechanisms, such as, “How will we support learners as they come to understand important ideas and processes? How will we prepare them to autonomously transfer their learning?” (McTighe and Wiggins 2012, 6).

It is important at this stage in the design process to keep the purpose of the learning at the forefront of decision-making. Technology (or lack thereof) should not compromise the original intent or integrity of the learning experience, and in fact badge systems need not be overly complicated; using freely available tools, anyone can create and issue a badge in a matter of minutes. A basic badge system grounded in solid curriculum design is far more valuable than a complex system boasting bells and whistles that does not represent authentic learning. Furthermore, pilot programs that make use of existing resources can serve as prototypes that may help secure funding for future enhancements.

By depicting incremental goals and learning pathways, badge systems offer the opportunity to build scaffolding and feedback into the learning experience. Badging mechanisms can be leveraged during the curriculum design process to guide the learner’s journey to the culminating badge.

Badge Systems as Curriculum Maps

In essence, badge systems are illustrative curriculum maps that depict the pathways learners will take in order to achieve the desired outcome. As with any well-designed curriculum, broader learning goals, represented by the badge, should be broken down into measurable learning objectives and activity sequences that prepare learners to succeed in meeting a competency. The learning sequence that leads to a culminating badge can be depicted as a series of sub-badges or tokens of achievement. While culminating badges represent summative assessments, sub-badges can be used to indicate formative assessments (Higashi et al. 2017). In this respect, badge pathways provide mile markers on the learning journey, signaling opportunities for reflection and feedback.

By mapping out curriculum objectives in relation to broader learning goals, badge systems illustrate learning schemas that help maintain the transparency of purpose. A badge system might take many forms, such as a ladder of lower-level badges ascending to “summit” badges (see chapter 4), a hierarchy of sub-badges that accumulate to culminating meta-badges (see chapter 11), or thematic groupings, such as the educator professional development badges offered by Digital Promise (<http://microcredentials.digitalpromise.org/>).

Badge system diagrams may also be depicted as more fluid constellations, which can be used to convey flexibility when the order of learning activities is not prescribed. Whatever the design style, mapped badging systems illuminate and acknowledge not only the outcomes but also the learning *process* that leads to the culminating achievement.

Leveled badge systems are particularly pertinent to mastery learning, which “allows a student to keep trying until they reach a certain competency” as opposed to “traditional classroom assessments that score a student and then progress to the next lesson” (Rimland and Raish 2018, 215). Mastery-oriented systems, commonly used in game design, leave room for failure and “treat errors and mistakes the players make as an opportunity to provide diagnostic feedback and encouragement” (Blair 2011, 3). Badge systems should ideally allow learners multiple attempts to complete each learning activity and provide reinforcement for learners as they strive toward more complex goals at their own pace.

Several worksheets and guides are available for mapping out badge systems. Along with Wiggin and McTighe’s curriculum planning resources, such as the 1-Page Template with Design Questions for Teachers (figure 1.2 in Wiggins and McTighe 2005, 22), readers may refer to DigitalMe’s badge academy and Badge Design Canvas (<https://www.openbadgeacademy.com/Getstartedwithbadges>), the Sprout Fund’s resources, including a badge design tools page (<https://medium.com/sprout-digital-badges>), Peer 2 Peer University’s Badge Maker Course (<https://badges.p2pu.org/en/about>), and Little Bird Games’s badge design guidelines and worksheets on designing a badge-based curriculum (<http://dev.modcourse.com/students/classes/badge-based-curriculum-1>). In accordance with the backward design model, the aforementioned resources begin with considerations about the broader purpose and learning goals before considering related instruction and activities.

Signaling Progress with Achievements

While culminating badges communicate validated competencies to external audiences, incremental sub-badges can serve as internal achievement markers within a badge system. Lower-level achievements may not be considered worthy of credentialing status (i.e., displaying on a portfolio), and in fact the awarding of “lightweight” badges tends to raise concerns about diluting the badging ecosystem and undermining the legitimacy of badges as a serious form of credentialing. “It is to a learner’s advantage,” note Rimland and Raish (2018), “to earn higher-level badges to display a select few badges that convey more learning, rather than many low-level badges” (218). As achievement markers issued within a learning system,

however, sub-badges indicate progress and provide positive reinforcement that can motivate the learner as they “level up” or work toward a culminating badge.

Achievements are a mechanism often used in gaming environments to engage players and encourage them to improve upon their performance. Providing achievement opportunities that range in difficulty encourages learners of all abilities to be more confident in attempting tasks that seem more attainable (Blair 2011, 2). Hickey and Willis (2017) advocate for the motivating effect of lower-level achievements, stating that badge systems are most successful “when initial badges are easy to earn and provide access to more advanced badges” (58). Lower-level achievements can provide an engaging entry point into a badging system by providing opportunities for early successes and positive feedback. While there is potential for collections of lightweight badges to communicate the bigger story of collective learning experiences, badge designers may want to reserve credentialing status for more robust culminating badges that clearly communicate demonstrated competencies while utilizing lower-level achievements as internal stepping stones contained within the learning system.

On the other end of the spectrum, challenging achievements, particularly those that offer social distinction for the earner, can engage learners by stimulating competition. Examples of successful badge programs suggest that “offering badges that are scarce and hard to earn” can be motivating for learners, especially if they unlock special opportunities or privileges (*ibid.*, 51). Even if learners do not earn the achievement, they may be encouraged to put forth more effort in striving toward a meaningful goal. Vicarious experience or “seeing people around you succeed” also influences learners’ self-efficacy, suggesting the potential benefits of social components such as leaderboards (Blair 2011, 2) and badges awarded for meaningful engagement and contributions within a learning community (see supplementary badges in chapter 9).

Until badges become more ubiquitous to the typical observer, the most immediate applications for lightweight badges are as guideposts and feedback mechanisms for learners. Carla Casilli (2014), who has directed badge design practices at Mozilla, Badge Alliance, and IMS Global, has advocated for lightweight badges largely due to their signaling power for the learner, for “in their accumulation they tell different stories to both the earner as well as the public” and serve as “markers and data points in the larger, more complex concept of self.” To avoid learner confusion, badge designers should clearly distinguish between badges that may be earned and displayed and achievement markers that are internal to the learning system (e.g., with different

badge shapes, sizes, or terms) while being mindful not to overwhelm learners with unfamiliar terminology.

Flexible Learning Pathways

By emphasizing achievements over seat time, badge systems offer opportunities for flexible and customized learning. While the culminating badge is anchored in the learning outcome and its associated criteria, the methods by which the learner reaches that achievement and the evidence provided can vary. Badge designers can build this flexibility into the badge system by offering multiple pathway options, choices in the evidence submitted, and personalization of the learning experience.

A choose-your-own-adventure-style badge system that allows learners to pursue different pathways depending on their preferences or aptitude might be considered the ideal design in terms of the flexibility and autonomy offered to the learner. This model might build on the gamified associations with badges by presenting branched pathways or triggering shortcuts upon demonstration of prior learning (e.g., earning 100 percent on a quiz). The design for this system would be complex, however, due to the additional content for each possibility and the triggering mechanisms required. As a simpler alternative, badge designers might allow learners to choose from groupings of activities (e.g., completing three out of five), based on their personal preferences, that all meet the same objective.

A badge system design can also differentiate the methods by which learners demonstrate their knowledge. Constructivist pedagogy asserts that “there are many ways to construct meaning, and there is not one universal way of processing that information” (Rimland and Raish 2018, 213). Allowing learners to meet criteria using their choice of format (e.g., written response, oral presentation, multimedia slideshow, etc.) or even a more open-ended choice of method encourages them to leverage personal strengths and take ownership of their learning. To earn a badge issued by Digital Promise, for example, educators must submit an application form describing how they have met the learning objectives and provide supporting evidence. Through this process, the learner gains practice in articulating competencies and is more connected to the purpose of the learning. An application system can also help with workflow by shifting responsibility to the badge earner to signal when an assignment is ready for review.

Finally, badge systems can offer flexibility through personalization. Rimland and Raish (2018) stress that the learning experience depends on the learner. “What is important to remember,” they write, “is that it is impossible

to design student learning. The instruction that should theoretically lead to desired learning outcomes for students can be designed, but it is impossible to state that we are able to design the student's learning experience" (211). Badge system designers should therefore provide opportunities for learners to make their own connections and meaning. Hickey and Willis (2017) encourage the incorporation of learner reflections and self-assessment models in badge systems, noting that "what seems particularly promising is asking learners to reflect on their *engagement* in learning rather than reflect on the *outcomes* of that learning (because focusing on the outcomes is likely to emphasize performance goals rather than learning goals)" (62; emphasis original). Along with reflecting throughout the learning process, learners might also submit culminating reflections or annotated learning artifacts to be included as evidence in the awarded badge's metadata.

Technical Infrastructure and Logistics

Considerations regarding the technical infrastructure of badging systems are reserved for the final stage of design; while it may be tempting to start the design process based on the latest tool or trend, badge designers should avoid letting the technology dictate the curriculum. As badging system technologies will continue to evolve following the publication of this volume, the scope of this chapter remains focused on design principles. For more technical guidance, readers are referred to "Badging Platforms: A Scenario-Based Comparison of Features and Uses" (Dimitrijević et al. 2016), which provides a thorough overview and practical analysis of several badging platforms and their features.

Badging Platforms and Learning Management Systems

When considering technology solutions, options typically include ready-made, modular, or custom-designed systems (see Bryan M. Mathers's visual representation of these options at <https://bryanmmathers.com/choosing-a-badging-system/>). While creating and issuing a standalone badge is fairly straightforward, out-of-the-box solutions for creating badging *systems* are scarce to non-existent at the time of writing.

One of the simpler options is to incorporate badging functionality into an existing learning management system (LMS). Third party badging applications—increasingly prominent in LMS environments, such as Canvas and Moodle—allow for the integration of badging features into a course using compatibility specifications such as Learning Tools Interoperability (LTI). The LMS facilitates the delivery and assessment of learning content

associated with requirements for earning a badge and provides built-in technical support. Mechanisms such as triggers that unlock content upon successful completion of an activity are conducive to the awarding of incremental achievements. A learning management system can also be limiting, however, if its structure does not accommodate the desired badge system scheme. A hierarchical design, for example, may not be feasible using a linear, module-based LMS.

For more flexibility, badge designers might consider creating their own custom systems, which can be assisted by open source tools such as Badgr (<https://info.badgr.io/>). Alternatively, separate platforms may be used for content delivery and the issuing of badges (see the Badge Alliance's list at <http://www.badgealliance.org/badge-issuing-platforms/>). For example, on-line course content may be used in conjunction with tools such as Credly that can be used to manually issue badges for learning experiences completed on-line or in person, via emails sent to qualifying learners or activity codes that are revealed upon successful completion of a task. This method may be more labor-intensive but also requires less technological groundwork.

Assessment Tools

Authentic assessments—particularly for more fluid competencies, such as those related to information literacy—most often cannot be automated. Scaled assessment of badge assignments may be challenging, however, for librarians who are not teaching their own courses or who have a wide range of responsibilities beyond teaching.

Some of the more successful and sustainable badge designs use a combination of computer-based and human assessment (Hickey and Willis 2017, 43). Higashi et al. (2017) present a combination of assessment techniques for different types of evidence, including self-assessment, automated assessment (e.g., quizzes, workshop participation, etc.), and manual assessment by experts. Rimland and Raish (2018) likewise suggest consolidating and prioritizing instructor feedback for high-stakes activities, such as a “comprehensive reflection that has students consider their previous learning and connect it to what they feel they learned from the badge. . . . This allows for personalized responses to that particular step but lighter or automated assessment of previous tasks within that badge” (215).

Building on collaborative or co-teaching partnerships, librarians may also enlist faculty members to review the work of their own students—or perhaps graduate students, who may be able to assist with verifying submitted evidence. Rubrics can be used to facilitate scaled assessment and to ensure consistency in evidence evaluation (ibid., 218). Authentic assessment practices

are essential to the validity of the badge claim and should not be compromised for the sake of expediency.

Badge Design Team

As a final point of consideration, badge program designs will benefit from diverse input and expertise. Assembling a model design and implementation team can be especially helpful when applying for grant funding. When embarking on a badge project, librarians may want to consider enlisting some (or all) of the following professionals:

- instructional designers
- game designers
- information technology professionals
- marketing or publicity specialists
- graphic designers
- Web developers
- badge design consultants
- graduate assistants (e.g., for help reviewing work, troubleshooting, or promoting the badging program)

CONCLUSION

As an emerging educational technology, digital badging is still being defined by leading practitioners. In order for the badge ecosystem to thrive and for badges to be widely accepted as meaningful credentials, badge designers will need to ensure that badges represent relevant, transferable, and verifiable claims supported by detailed metadata and evidence. As flexible educational tools, badge systems can be used to orient and enhance authentic learning experiences around defined curricular goals.

Unlike degrees, courses, and job qualifications, which might be exaggerated or elaborated, badges cannot pretend to be something they are not. The best way to refute critics who doubt the validity of badges is to prove their value by example, in the design of carefully described, verifiable badges that represent demonstrated competencies.

Rooted in their originating values of transparency and recognition, badges are beacons of purposeful learning. They allow educators to promote and acknowledge significant learning experiences and to signal valuable competencies to employers. When thoughtfully developed and pedagogically grounded, badges can be used to enhance, communicate, and showcase quality teaching and learning.

Table 6.1. Badge Applications Aligned with Backward Design Stages

<i>Backward Design Stage</i>	<i>Role of the Badge</i>	<i>Design Considerations</i>	<i>Steps</i>
Establish desired results. For example, the badge earner will demonstrate an understanding of their role in the scholarly conversation.	Showcase a learning competency.	What is the purpose of the badge? How is it relevant for the learner and potential reviewers?	<ol style="list-style-type: none"> 1. Evaluate institutional, local, and national needs. 2. Establish learning outcomes. 3. Create a tentative badge title and image.
Determine acceptable evidence. For example, the badge earner will demonstrate mastery of this competency by submitting a culminating project in the form of a reflective essay or media presentation.	Document and validate the learning experience.	Is the competency transferable? How will learners demonstrate competency? What criteria will be used to assess the submitted evidence?	<ol style="list-style-type: none"> 1. Identify suitable evidence (learning artifacts, test scores, endorsements, etc.). 2. Create assessments. 3. Create metadata according to OBI standards.
Plan learning experiences and instruction. For example, in preparation for meeting the learning outcome, the badge earner will be able to distinguish between popular and scholarly resources.	Illustrate learning pathways.	What scaffolding is required to help learners reach the learning goal? How might the larger learning goal be broken down into smaller learning objectives and formative assessments? What infrastructure is needed to support and sustain content delivery and assessment?	<ol style="list-style-type: none"> 1. Map the curriculum. 2. Determine and/or build supporting infrastructure (e.g., LMS, website, badge issuer integration, etc.).

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