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Failing Better: Scaffolding Learning with the Metaliteracy Badging System

Kelsey L. O'Brien
University at Albany, State University of New York, klobrien@albany.edu

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Abstract

The Metaliteracy Badging System, collaboratively produced by educators from across the State University of New York (SUNY), has undergone several trials and transformations. Over the course of this iterative journey, this resource has served in often-unexpected ways as a flexible educational tool that facilitates meaningful curriculum design and collaborative teaching. This chapter provides an overview of the design and implementation of the system, along with our challenges and goals moving forward. Just as we teach our students to fail better, we too have drawn on our setbacks as opportunities for growth and improvement.

Keywords

digital badges, microcredentials, information literacy, metaliteracy, instructional design, libraries

Disciplines

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Failing Better

Scaffolding Learning with the Metaliteracy Badging System

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Since its inception in 2012, the Metaliteracy Badging System, collaboratively produced by educators from across the State University of New York (SUNY), has undergone several trials and transformations. Over the course of this iterative journey, the educators involved have learned a great deal about badges and, more broadly, about adaptability, creativity, and innovation.

With the metaliteracy framework as its foundation, our badging program evolved from the need to address students' increasingly participatory roles in social online environments. Congruous with the values of the Open Badging movement, metaliteracy promotes lifelong learning by cultivating self-improvement and empowering students to take ownership of their educational accomplishments.

The Metaliteracy Learning Collaborative leveraged the emerging badge system infrastructure to implement badges not just as learning capstones but also as progress markers and feedback mechanisms that support learners as they grapple with increasingly advanced concepts. The scaffolded design of the system leaves room for students to fail, reflect, and grow as learners; likewise, this project has encouraged the librarians and faculty involved to adapt and persist throughout the course of its development.

Over the last several years, the Metaliteracy Badging System has served in often-unexpected ways as a flexible educational tool that facilitates meaningful curriculum design and collaborative teaching. This chapter provides an overview of the design and implementation of the system, along with our challenges and goals moving forward. Just as we teach our students to fail better, we too have drawn on our setbacks as opportunities for growth and improvement.

PREPARING TWENTY-FIRST-CENTURY LEARNERS TO BE GLOBAL CONTRIBUTORS

Setting

Located in New York's capital, the University at Albany, State University of New York (SUNY), serves a diverse population of about seventeen thousand undergraduate and graduate students. As one of sixty-four campuses in the SUNY system, the University at Albany (UAlbany) leverages its consortial status with expansive opportunities and shared online programs and resources offered through Open SUNY (http://navigator.suny.edu). Minority students make up nearly half of the university's undergraduate population, and its robust international program has attracted students from more than ninety nations (Admissions, UAlbany, SUNY, n.d.). Branded in 2008 as "the world within reach," and led for the past several years by presidents proudly representing minority backgrounds, the university values diversity, inclusion, and global awareness (for more information, visit https://www.albany.edu/about-ualbany).

Information literacy, one of four required academic competencies in the university's General Education Program (see https://www.albany.edu/generaleducation/), plays a central role in preparing UAlbany students to engage critically and ethically in increasingly globalized information environments. The university has a two-tiered general education requirement that encompasses information literacy, writing, oral discourse, and critical thinking. The required Writing and Critical Inquiry course introduces students, generally in their first year, to all four competencies, while the upper level requirement is embedded within each major. The University Libraries' Information Literacy department, in conjunction with subject librarians, supports both levels of the information literacy competency. Through credit courses and instruction integrated throughout the curriculum, the department "empowers students to be confident users and creators of information in a dynamic and continually evolving information landscape" (University Libraries, UAlbany, SUNY 2015). Our instruction therefore focuses not just on developing skills, but fostering mindful engagement and practices across the spectrum of information communities, both within and beyond the classroom.

Metaliteracy Framework

The metaliteracy framework, based on Mackey and Jacobson's seminal article, "Reframing Information Literacy as a Metaliteracy" (2011), informs the University at Albany's information literacy general education requirements, as well as ACRL's *Framework for Information Literacy for Higher Education*.

Metaliteracy expands on information literacy concepts to acknowledge and support learners' roles as active participants and contributors in dynamic and inherently social online environments, in which the lines between consumer and creator are often blurred (Mackey and Jacobson 2011). While students may not view themselves as authors or publishers, their ability to share information on global platforms with the click of a button positions them with a greater latitude and responsibility than had students of previous generations and calls on information specialists to help them do so critically, safely, and ethically. Metaliteracy therefore addresses not only students' skills but also their ways of thinking and interacting in the world.

The Metaliteracy Learning Collaborative, a diverse team of SUNY librarians, disciplinary faculty, instructional designers, and administrators, assembled in 2012 with the goal of updating information literacy standards for twenty-first-century learning environments (SUNY 2013). Envisioning a comprehensive literacy infused throughout students' academic careers that would transcend disciplinary boundaries, the collaborative developed the metaliteracy learning objectives (Mackey, Jacobson, and Metaliteracy Learning Collaborative 2018). The "meta" in *metaliteracy* might be considered twofold in meaning, indicating both the all-encompassing nature of the competencies applicable across educational settings and also its self-referential qualities, which encourage learners to reflect on their learning processes and essentially learn how to learn.

Flexible by design, the metaliteracy learning objectives are applicable across a range of disciplines and learning contexts, aiming to support learners in participatory roles as they collaboratively produce, share, and repurpose information. Metaliteracy addresses behavioral (i.e., skills and competencies) and cognitive (i.e., comprehension and understanding) components of learning and more notably incorporates two additional domains—metacognitive and affective—that take learners' dispositions, attitudes, and thought processes into account. As twenty-first-century learners engage in increasingly complex and fraught information environments, the metaliteracy principles provide pertinent guideposts, preparing our students to participate as informed consumers and responsible digital citizens.

The Metaliteracy Learning Collaborative's work coincided with higher education's first ventures into digital badging. As a promising new credentialing mechanism that offered more granular recognition of learning across formal and informal contexts, badging presented a venue in which to explore a more broadly scaled implementation and assessment of the learning goals established by the metaliteracy framework. Thus the collaborative began investigating the potential for a SUNY–wide metaliteracy badging program in 2012 and first piloted the system at the University at Albany in the fall of 2013.

Over the course of its development, the Metaliteracy Badging System has been supported by three SUNY–funded Innovative Instruction and Technology Grants, one small online teaching and learning grant, contributions from the university provost, and substantial funding from the University Libraries' dean for the most recent upgrades and enhancements on a customized platform. In many instances, we set out to accomplish goals for a particular grant only to discover further applications and possibilities for the system in the process, which required additional funding but also propelled us to strive toward a full realization of the potential held by this flexible educational tool.

DESIGNING SCAFFOLDED LEARNING

The content of the Metaliteracy Badging System maps to the learning goals and objectives established by the metaliteracy framework. Scaffolded in design, the system facilitates mastery learning by enabling self-evaluation and feedback and by fostering a sense of learner agency.

Using WordPress, the BadgeOS plug-in, and the Credly API, we created leveled badge trees and achievement triggers that enable the issuing of Open Badges upon successful completion of prerequisite assignments. While the core functionality discussed in the following section has remained intact, the technical infrastructure of the system has evolved over the course of its development, as discussed in the final section of this chapter.

Metaliteracy places the emphasis on the learner by fostering learner agency, ownership, and identity. Likewise, the Metaliteracy Badging System is oriented around the metaliterate learner. Both in content and structure, the system guides students as they explore their roles as empowered learners and contributors, reflecting on their own thinking and learning processes and recognizing their achievements as the fruition of both their successes and failures.

Badges as Identity Markers

The Metaliteracy Badging System consists of four core *master badges*: Master Evaluator, Digital Citizen, Producer and Collaborator, and Empowered Learner (figure 11.1). The Metaliterate Learner figure (figure 11.2), which situates the learner at the nexus of their learning and expands out as concentric circles representing a variety of active learner roles, inspired the design of the culminating Metaliterate Learner badge. The quadrants of the culminating badge represent the four comprising master badges, as well as the four interrelated learning domains that span across the metaliteracy learning objectives.

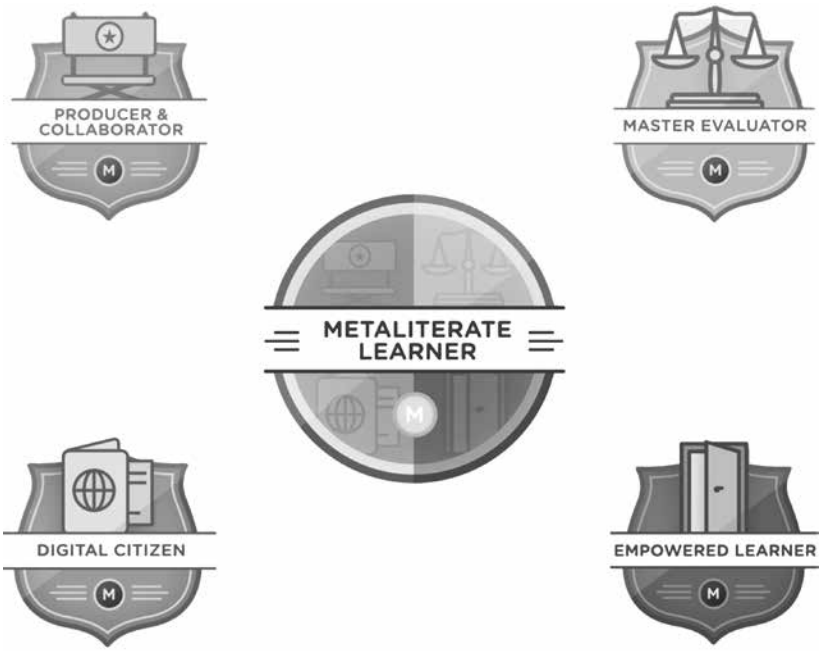

Figure 11.1. The Metaliteracy Badges

The metaliteracy badges correspond to the goals outlined by the metaliteracy framework (Mackey, Jacobson, and Metaliteracy Learning Collaborative 2018), as illustrated in table 11.1 (Please note: badges were aligned with the 2014 learning goals and objectives, which have since been revised). The badges thus establish the desired roles and responsibilities that we cultivate in our students as they prepare to contribute knowledge in academic and professional contexts.

The naming convention for the metaliteracy badges intentionally indicates transformative titles claimed by the earner. A metaliteracy badge does not simply represent the final outcome of a learning experience but rather the translatable role assumed by the learner and the corresponding dispositions and ways of thinking that may be applied to future learning situations. As the information landscape and its affiliated technical demands constantly fluctuate, metaliteracy concepts foster adaptability and self-efficacy, rather than focusing on isolated skills or experiences.

The metaliteracy badges thus empower the earner to be a lifelong learner. In gaming environments, achievements earned for milestone accomplishments or exceptional performance become a part of the player's identity. Displayed on a social profile, earned achievements signal specialized skills and establish the

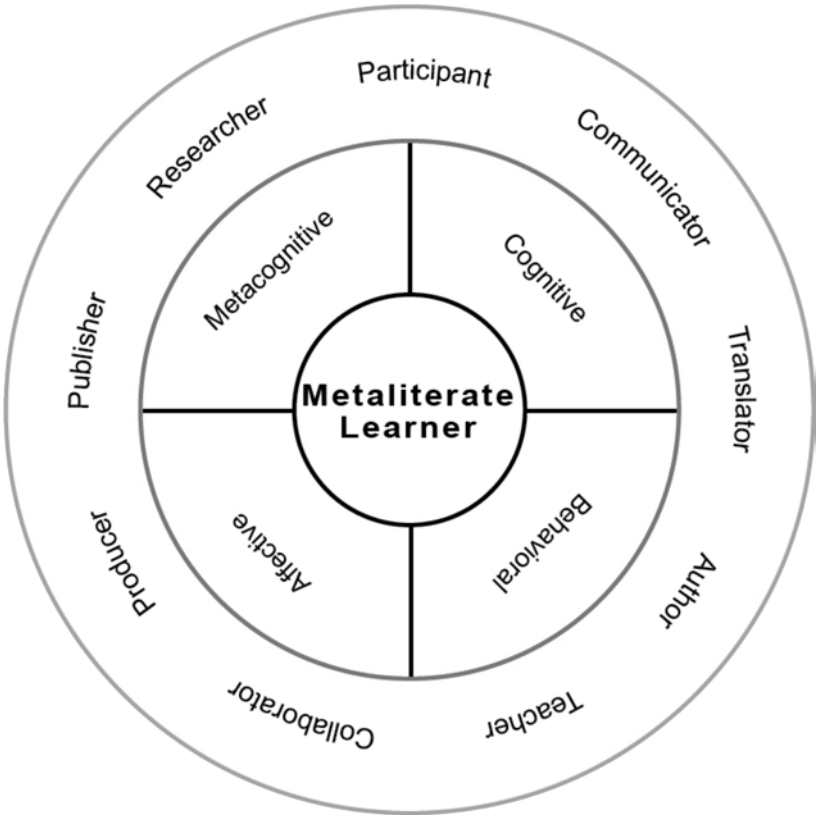

Figure 11.2. The Metaliterate Learner
[FC>Mackey and Jacobson 2014.

player's value within the wider gaming community (Blair 2016, 66). Likewise, metaliteracy badges showcase the earner's accomplishments and their value to wider academic and professional communities. Compared to a typical course assignment, which often consists of an isolated transaction between instructor and student, a metaliteracy badge represents a more fully realized role and responsibility placed on the earner.

While the culminating metaliteracy badges indicate transformative roles incorporated into the learner's identity, the component sub-badges in the system prepare learners to take on these roles by continually reflecting on their own learning processes.

Sub-badges as Progress Indicators and Feedback Mechanisms

Using the metaliteracy framework as our guide, we employed a backward design approach to map out the badge system content. Considering what stu-

Table 11.1. Metaliteracy Badges Aligned with Learning Goals (2014)

	**Badge:** Master Evaluator **Goal 1:** Evaluate content critically, including dynamic, online content that changes and evolves, such as article preprints, blogs, and wikis.
	**Badge:** Digital Citizen **Goal 2:** Understand personal privacy, information ethics, and intellectual property issues in changing technology environments.
	**Badge:** Producer & Collaborator **Goal 3:** Share information and collaborate in a variety of participatory environments.
	**Badge:** Empowered Learner **Goal 4:** Demonstrate ability to connect learning and research strategies with lifelong learning processes and personal, academic, and professional goals.

dents would need to be able to do and understand in order to accomplish the four broader outcomes, we delineated the metaliteracy learning objectives into measurable assessments and activities that would lead to the earning of each metaliteracy badge. In designing the curriculum we found that several of the objectives overlap and intersect across the four broader learning goals; so, while the badge system content does not directly align with each objective laid out by the metaliteracy framework, it does address every learning objective.

In what amounted to a visualized curriculum mapping exercise, we created a tiered constellation of prerequisite learning activities and assessments for each badge. Figure 11.3 presents the Master Evaluator constellation as an example.

Each badge constellation consists of four cumulative levels: quests, challenges, content badges, and master badges. Students advance from the lowest quest level to the master badge level, at which point they may earn and share an open, metadata-enhanced badge via Credly. The incremental badges that make up the three lower levels serve as progress markers in that they are only awarded within the system and are not programmed to be issued via Credly. A metaliteracy badge displayed on an earner's profile is therefore a meaningful and robust credential that represents authentic learning and in-depth engagement with the metaliteracy concepts.

The hierarchical structure of the badge constellations lends itself to a scaffolded curriculum design that allows students to make multiple attempts as they advance through increasingly complex concepts at their own pace. By mapping out the learning scheme for students, visualizing their progress, and providing consistent checkpoints, the badge system enhances learners' recognition and understanding of their own learning processes.

Blair (2016) notes the double value of achievements in games, in that they "act as a goal before they are earned and an artifact of the accomplishment

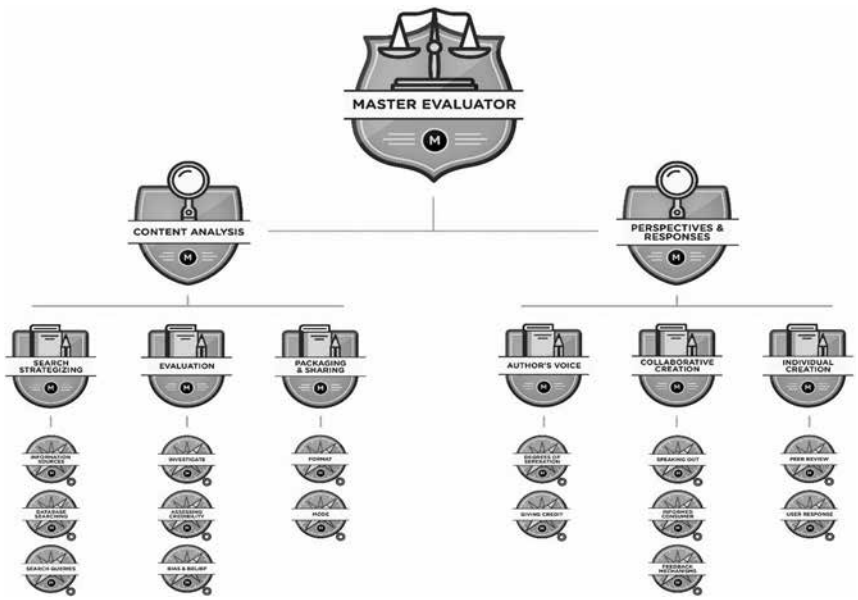

Figure 11.3. Master Evaluator badge constellation

afterwards" (63). Before students embark on the metaliteracy quests, the badge constellations provide visual roadmaps of the learning activities that they will progress through in order to earn a master badge, in effect heightening their awareness of broader curriculum goals and the relationships between introductory and advanced concepts. As students engage with the content and successfully complete each component, the constellations serve as illustrative progress maps, providing positive reinforcement in the form of earned achievements that fill in the corresponding icon on the learner's profile, marking their advancement as they strive toward the master badge.

While students may complete quests in any order, they must master the lowest levels in a series before they advance to the next level. The scaffolded structure of the badge system thus facilitates self-paced learning and provides opportunities for continual feedback. Upon successful completion of prerequisite quests, capstones unlock at the challenge and badge levels, prompting students to synthesize what they have learned thus far. The system allows students multiple attempts, enabling them to resubmit based on reviewer feedback and to build on their understanding rather than simply accepting that they have failed the assignment. An earned badge therefore indicates not only completion but also persistent engagement and mastery of the concepts.

The scaffolded design also encourages learners to slow down and reflect on their learning processes, counteracting habitual information-seeking practices that often prioritize instant gratification over quality. Quest level activities aim to meet students where they are by introducing foundational concepts within familiar contexts. Quests that fall under the Master Evaluator badge, for example, include discussions about Google and Wikipedia and teach students how to conduct a more effective Web search. As students advance through each level, activities become increasingly metacognitive, prompting students to synthesize and apply what they have learned. At the challenge level of the aforementioned badge, for instance, students begin to consider the varied perspectives and voices (including their own) of information creators, applying what they have learned in preceding quests to develop a search strategy for a research project. Upon reaching the master badge level, students submit a culminating assignment that demonstrates mastery and serves as a learning artifact of the badge's claimed competency.

The badging system content incorporates a variety of multimedia and interactive elements, including embedded YouTube videos and self-check quizzes. The activities include both original content written by the Metaliteracy Learning Collaborative and open online content, including Web articles, blogs, and Creative Commons–licensed videos and images. The activities thus promote openly shared resources while also simulating real-world scenarios, preparing

students to navigate online resources and encouraging exploration beyond a contained learning environment.

Teaching Students How to Fail

Many educators can attest to the common challenge of students' hesitation to contribute during class activities and discussions, which often seems to stem from a fear of failure; indeed, it seems that millennials are particularly risk-averse, often favoring image among their peers over genuine academic inquiry (for more on this discussion, see chapter 3). The metaliteracy content in the badging system aims to make students more comfortable with failure, helping them to recognize their initial struggles as a natural part of the learning process.

The Empowered Learner badge, for example, incorporates several exercises that encourage students to develop metacognitive practices for problem solving and self-directed learning. In the Failing Better challenge, students reflect on their past failures and learn about the benefits of adapting a growth mindset, as defined by social psychologist Carol Dweck (2006). The challenge concludes with a capstone for which students anonymously post on a "failure wall," a Padlet-generated page of student stories that has become a communal testimony to the ubiquitous experience of failure. Likewise, in the Adapt and Persist challenge students learn how to be strategic and flexible when attempting difficult tasks, even when things do not initially go according to plan, a mantra that can be especially useful when teaching students about the research process.

By scaffolding learning activities and acknowledging students' feelings as they grapple with the concepts, the Metaliteracy Badging System aims to support and empower students as they learn to navigate and contribute to complex information environments. The metaliteracy exercises thus cultivate an underlying mindset that helps students develop resilience as researchers and learners.

IMPLEMENTING A COLLABORATIVE TEACHING MODEL

Librarians teaching information literacy courses and a lecturer in the Writing and Critical Inquiry (WCI) program first piloted the Metaliteracy Badging System in the fall of 2013. Since then, applications of the system have expanded exponentially across dozens of courses and a wide range of disciplines, including English, psychology, informatics, criminal justice, and education. Undergraduate students, particularly first-year students enrolled

in WCI, are the primary users, but an ongoing grant-funded project with an instructor in the School of Education has demonstrated potential expansion of the content for graduate students (SUNY 2016).

Due to metaliteracy's focus on metacognitive proficiencies, the assignments in the Metaliteracy Badging System are reflective in nature, typically consisting of short essay-style responses that require manual grading. In order to scale and sustain this assessment process, we have adopted a collaborative model in which faculty members assign the metaliteracy badging exercises in their courses and review the work of their own students. This model has enabled flexible applications of the metaliteracy content across various disciplinary contexts and has fostered meaningful faculty–librarian partnerships that include collaborative lesson-planning, co-teaching, and sustained conversations related to student research projects.

Badges as Promotional Tools and Conversation Starters

The implementation of the metaliteracy content typically begins with a meeting between the faculty member and a librarian. Among its many applications, the Metaliteracy Badging System has served as a valuable marketing tool that provides an entry point to conversations about information literacy instruction. The faculty member often reaches out after learning about the badging system via promotional materials, for which the metaliteracy badges provide memorable logos, the Badges FAQ page on the Information Literacy department page, or simply by word of mouth. For instructors who are seeking information literacy instruction, initial planning meetings often naturally progress to the badges as a pertinent teaching resource.

The badge constellations, displayed on a large poster in my office, provide valuable talking points during instruction planning meetings, serving as a visual map of the metaliteracy principles and learning outcomes we have established for students. In effect, the badge graphics provide a preview and a summary of the instructional services that we offer. The constellations also illustrate relationships between fundamental concepts at the quest level, such as copyright—which faculty may be more accustomed to librarians teaching—that lead to more complex culminating concepts at the badge level, such as information ethics. This can be an illuminating discussion for instructors who are often unaware of the breadth of topics and competencies taught by librarians and the ways in which these concepts interweave with their own curricular agendas.

The metaliteracy objectives' alignment with disciplinary learning goals can bring structure to the concepts that faculty members are already teaching. Quests, which on average take about twenty to thirty minutes to complete,

provide helpful thought exercises and precursors to research assignments, and can serve as formative assessments over the course of larger research projects. In the initial planning meetings, librarians work with faculty to decide how the metaliteracy assignments best fit into their curricula. The badge system content is flexible, so instructors may assign a selection of stand-alone quests that meet their particular instructional needs or a full series of exercises that lead to a culminating challenge capstone or badge.

The Metaliteracy Badging System uses binary assessment functionality, offering reviewers the option to mark submissions as *accept* or *resubmit*, so it is up to instructors to decide how much credit to assign for successful completion of a quest. Some instructors have assigned quests as extra credit, while one political science instructor designated badge assignments as 30 percent of the course grade. Due to the flexible nature of the assignments, students do not typically earn a master badge within one course but, rather, within several different courses over an extended period.

Teaching with Metaliteracy Badges

Badge exercises are commonly assigned as prior learning assessments in conjunction with face-to-face library instruction. This flipped classroom model allows the instructor and librarian insight into student understanding and provides students with the opportunity to grapple with complex concepts on their own before applying what they have learned in more hands-on library sessions. Quests covering foundational concepts such as database searching allow librarians to forego bibliographic lectures for more nuanced classroom discussions.

Some of the most in-depth implementations of the badging content have been with the Writing and Critical Inquiry program, a required course for first-year students that prepares them for academic writing and research (University at Albany, SUNY, n.d.). As one particularly successful example, two librarians have collaborated with a WCI lecturer over the past two years to implement badging exercises in conjunction with five co-taught library sessions. The badge assignments serve as touchstones throughout the semester that we periodically refer to and reinforce in class, providing thematic undercurrents such as the growth mindset and research as a conversation. While students are often inclined to rush through research assignments, the badge system exercises prompt them to pause, reflect, and continually revise throughout the process. When students feel they have reached a dead end in their research, for example, metaliteracy concepts encourage them to persevere and try a different approach rather than simply switch topics.

The badging system has allowed for meaningful integration of metaliteracy learning objectives into a variety of courses, which places metaliteracy in context and allows students adequate time to grapple with important concepts that are difficult to cover in one-shot library sessions. Some instructors have invited the librarians to visit their classrooms as students present on final projects related to the metaliteracy content, which in some cases have involved students creating their own quests. The metaliteracy badges have thus provided a valuable framework and vehicle for creative, collaborative, and sustained instruction, opening doors for librarians to have significant input in the general curriculum.

CHALLENGES AND LESSONS LEARNED

Feedback collected during the early stages of the Metaliteracy Badging System implementation, through conversations with instructors and informal, voluntary Google surveys, indicated that negative experiences with the system were mostly related to navigation issues. WordPress presented several challenges, because it is primarily a blogging platform, not intended to function as a learning management system (LMS). While the BadgeOS plug-in provided the core badging features, several additional plug-ins, such as LearnDash, were required to enable the private reviewing and submission of student work and the organization of users into private class sections. As the number of plug-ins increased, management of the system became more complicated and onerous, due to the constant upkeep and troubleshooting required when plug-ins became incompatible with each other upon completion of required updates. Consequentially, the system frequently experienced bugs or presented a broken interface. Additionally, quests assigned from various badges and for multiple courses often confused students who simply wanted to know what was required for a grade, and they lost the bigger picture of their progress toward earning a badge.

We have also learned that student reception of the badging system has little to do with their openness to badges and is largely dependent on how the instructor presents the assignments. Instructors who are enthusiastic about the metaliteracy content and communicate the purpose of the exercises to students tend to be much more successful than those who reluctantly assign the content to meet departmental information literacy requirements. This observation supports the value of collaborative lesson planning and has also highlighted a demand, particularly among graduate assistants, for more support in teaching and assessing the metaliteracy concepts, which we plan to address in the near future with faculty workshops and orientation materials.

NEXT STEPS AND FUTURE GOALS

In order to address the technical and navigational issues experienced by users, we have been working to migrate the badging system to a new custom-built platform that will enhance students' experiences with personalized learner profiles and interactive progress maps. While many of the problems already described call for LMS functionality, Blackboard Learn, our institution's LMS platform, does not provide sufficient badging mechanisms to accommodate our tiered badge system design. Thus, with the help of a Web development company and an educational Web design consultant, the Metaliteracy Badging System has undergone a redesign and rebranding due to be launched in the fall of 2018.

Our central goal moving forward is to enhance the flexibility of the system for educators and students. To facilitate discipline-specific applications of the system, our current work involves the development of functionality that will allow faculty members to remix existing quests and create their own customized learning pathways. Ultimately, we hope to offer the Metaliteracy Badging System as an open educational resource that can be implemented at any institution and customized for specific programmatic and disciplinary contexts.

Eventually we may also extend customization capabilities to students. While the pathways leading to the metaliteracy badges are fairly prescriptive, we envision potential "desire paths" (Casilli 2013) that would allow students to establish personal learning goals and chart their own journeys as metaliterate learners. Additionally, we hope to incorporate social features into the system, fostering a cooperative learning community that replicates the team-based methods implemented in our classrooms and that embodies the collaborative goals of metaliteracy.

Lessons gleaned from the Metaliteracy Badging System about flexibility can also be applied to the implementation of badge programs in general. It is important to remember that a badge is only a tool and that students and instructors' use of the tool could digress from what designers originally intended. Ideally educators should design badge systems to accommodate various use cases and allow the system to morph and evolve according to user needs and applications.

As demonstrated at the University at Albany, digital badges can facilitate valuable conversations and instructional collaborations by framing critical competencies for disciplinary faculty and by fostering self-reflective learning in students. Badges have the potential to empower students, helping them find their voice and make a contribution. In Assessing Credibility, for instance, students are encouraged to apply what they have learned to edit an inaccurate Wikipedia entry; in the Speaking Out quest students prepare to present on a

topic of interest to a public audience as they plan a hypothetical trip to Speakers' Corner in Hyde Park. In an increasingly tenuous information climate, we believe our students can make a difference not only as informed consumers but also as critical knowledge contributors and stewards of ethical information practices.

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