Designing and Implementing a Micro-credentialing System for a Local Government Leadership Training Program

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Abstract: Micro-credentialing or "badging" is a way to recognize competency-based achievements beyond degree programs or other formal educational offerings. Educational programs, particularly those in the digital learning, informal learning, and continuing adult education spaces, are increasingly adopting micro-credentialing technologies to empower learners. This case study analyzes the process of designing and implementing a micro-credentialing system for a learner-driven leadership curriculum for local elected leaders in North Carolina. It discusses the uses and challenges of micro-credentialing and the pros and cons of various micro-credentialing platforms.

Introduction

Digital badges are a form of microcredentials. They are issued by an organization for an individual user, and can be either internal to a website or online community, or use open standards and shared repositories. Badges enable issuers to assert that a learner has mastered a specific skill and connect this claim to comprehensive corroborating proof. In summary, a digital badge is a visual indicator of skill or accomplishment (Fanfarelli & McDaniel 2019). Casilli & Hickey (2016) offer a similar definition as "web-enabled tokens of learning and accomplishment."

The concept of badge-based alternative credentialing initiatives started in 2011, when Mozilla announced the launch of its Open Badge Initiative and "Digital Badges for Lifelong Learning" became the theme of the fourth Digital Meaning & Learning competition, in which over 30 innovative badge systems and 10 research studies received over $5 million in funding between 2012 and 2013 (cf. Fanfarelli & McDaniel 2019).

Open badges can be used interchangeably between different systems. Earners are motivated to distribute their badges across social networks, emails, and websites, with an expectation that the enclosed information will readily circulate within these platforms (Casilli & Hickey, 2016). A first version of the open badges standard was launched by Mozilla in 2013. In 2018, the new Open Badges 2.0 standard was released under the stewardship of IMS Global Learning Consortium.

This article presents a case study of introducing badging into a leadership training program for elected officials. The structure is as follows: We lead with a brief overview of the literature, then describe the technology selection and implementation process, and finally discuss current limitations of badging systems.

Literature Review

The scholarly discourses on microcredentials has significantly increased in recent years, in particular during and since the pandemic (Varadarajan, Koh & Daniel, 2023). Badges have the potential of transcending conventional paradigms of academic credentialing and educational assessment. A case study evaluation by Young, West & Nylin (2021) found that both badge earners and the issuer saw value in the badging program. The value stemmed from the

ability to share badges, which helps the earner establish their skills and increase their reputation while at the same time increasing awareness of the issuing program.

What is the benefit of microcredentials for learners? Ashcroft et al. (2021) conducted semi-structured, qualitative interviews as part of a work-integrated learning (WIL) use case, and found that microcredentials appeared to signal value to employers and students. However, negative or mediocre perceptions of digital badges in comparison to a regular certificate of completion have been reported (Dyjur & Lindstrom 2017). Kiiskilä, Kukkonen & Pirkkalainen (2023) conducted a qualitative interview study with students and administrators in higher education to assess what value digital credentials have compared to other forms of recognition, such as paper certificates. Their findings suggested that learners perceive the rich, descriptive data in the credential particularly valuable. The administrators interviewed projected that the interest in digital credentials will increase when more digital credentials are issued. Findings from an early interview study with hiring directors conducted by Erickson (2015) indicated that hiring directors have interest in open education and digital credentialing, particularly if structures reduce costs associated with ongoing professional training and increase the pool of skill labor. However, employers may have concern about the consistency of micro-credentials, their integrity and the potential for fraudulent credentials (Varadarajan, Koh & Daniel, 2023)

Are microcredentials a tool for persistence and retention? Iwata, Clayton & Saravani (2017) observed in a case study of an English language review course that the awarding of badges helped learners select appropriate learning modules, and fostered motivation for active engagement and completion. A case study evaluation by van de Laar et al. (2022) found that the use of microcredentials did not provide an incentive towards completion of the open online courses for doctoral students. Dyjur & Lindstrom (2017) found that badges provided additional motivation for program participants to complete a program; however, the participants did not do this solely to earn a badge.

What specific advantages do badges offer for adult learners and professional development contexts? Most importantly, badges create opportunities to document non-credit learning and accomplishments. Hunt et al. (2022) described microcredentials as a promising way to support professional development audiences who cannot be served by ‘sit-and-get’ formats with generalized content and instead need flexible, personalized offerings. Similarly, Berry, Airhart & Byrd (2016) viewed microcredentials as opportunities for learners to document learning through work samples, videos, and other artifacts, moving beyond traditional, course-based professional development.West et al. (2021) valued microcredentials as a promising approach to effectively assess inquiry-based learning in a way that honored the openness of student inquiry and matched the ill-structured nature of complex problem-solving.

Case Study

The Local Elected Leaders Academy (LELA) Program at the School of Government at UNC-Chapel Hill (SOG) provides learning pathways for elected officials in counties and municipalities in North Carolina to help them develop in their roles over their tenure. To progress through four levels of achievement (Practitioner, Master, Mentor, and Ambassador), these officials can select SOG course offerings and complete professional activities such as attending conferences for local elected officials or serving on committees. Completing each course offering or professional activity awards a certain number of credits (e.g. a 1-day course grants 6 credits), and each achievement level requires a certain number of credits to reach.

Up to this point, progress through these levels has been tracked on a spreadsheet for the participating county officials (~500 people) and not tracked at all for the participating municipal officials (~3000 people). LELA Program leaders reached out to the Instructional Design team at the School of Government to request the development of a system that would 1) allow for automated tracking of learners’ progress and 2) allow learners to easily view their progress and identify options for further learning. It was also important to the team that the system be usable by people with limited technological literacy, and that the new solution could be smoothly

rolled out to make a good impression. After consulting with the LELA team, we agreed that designing and implementing a system of micro-credentials using an existing micro-credentialing product was the best course of action.

We followed a series of steps encompassing phases of evaluation, design, and implementation, with the project currently in the implementation phase. Below is a figure outlining these steps; each is described in greater detail in the following sections.

FIGURE 1: IMPLEMENTATION PROCESS

Evaluation

To evaluate potential vendors, we developed an evaluation rubric to consider their performance across four factors: cost, learner experience, integration with Canvas (our learning management system), and the facilitation of individual learning pathways. We evaluated Canvas Credentials (formerly Badgr), Accredible, Credly, and Badgecraft, and based on our evaluation we ultimately decided on Canvas Credentials.

While reviewing each micro-credentialing platform, we kept in mind several factors: cost, learner experience, integration with Canvas (our LMS), and ability to create flexible learning pathways. Below is a rubric defining these evaluative criteria and a table showing how each platform performed.

Criteria	HIGH	MEDIUM	LOW
Cost	Pricing options are both competitive and flexible (offering either multiple pricing structures or tiered pricing with add-on features)	Pricing is somewhat competitive and offers some limited flexibility	Pricing is either unreasonable (much more costly than competitors) or offers no flexibility
Learner experience	Includes all of the following: • Login using our SSO • Simple user interface appropriate for low-tech literacy users • Clearly shows progress toward achievement levels and offers options for next steps • Easy sharing and integration of credentials to social media and websites	Includes 1-2 of the following: • Login using our SSO • Simple user interface appropriate for low-tech literacy users • Clearly shows progress toward achievement levels and offers options for next steps • Easy sharing and integration of	Does not support the learner experience adequately (lacking most features mentioned in High and Medium categories)

		credentials to social media and websites	
Canvas integration	Robust Canvas LTI including automatic badge assignment based on module or assignment completion and the ability to view progress within Canvas	Canvas LTI with limited features	No existing Canvas LTI
Learning Pathways	Allows construction of flexible learning pathways offering options for learner progression	Allows construction of "stackable" badge sets or collections of badges	No linking or grouping of badges

	Cost	Learner Experience	Canvas Integration	Learning Pathways
Canvas Credentials (formerly Badgr)	**HIGH**	**HIGH**	**HIGH***	**HIGH**
	$4000 year per 1000 badge recipients, with an additional setup fee and one-time fees for additional features such as SSO: $13,040	Learner dashboard is easy to understand and navigate, and learners can view pathway progress easily. SSO login will work similarly to our Canvas login.	While the current Canvas integration is somewhat buggy, Badgr is now part of Instructure and will therefore be the in-house badging option for Canvas going forward. Full rollout of new integration expected this fall.	This is the only product we reviewed that includes flexible learning pathways. While there are still limitations – in particular the inability to weight badges based on credits received – it far surpasses the functionality of any competitor in this respect.
Accredible	**MEDIUM**	**HIGH**	**MEDIUM**	**MEDIUM**
	$9600 per year for 1000 users for stacked badging plan	Accredible's accessible and usable interface, along with its excellent certificates, is its biggest selling point. Free SSO integration.	Accredible has a Canvas integration but does not directly award badges or certificates based on module completion. Instead, you can add a certificate as a module item and gate the module with requirements.	Accredible offers credential stacking, which means that earning criteria for a badge or certificate can include earning a defined set of prerequisite badges. This does not offer learning pathway flexibility.
Credly	**MEDIUM**	**HIGH**	**HIGH**	**MEDIUM**
	$8000/year for 1000 earners + $1000 for set-	Credly's interface is clear and easy for learners to use, and it	Credly's Canvas integration allows for automated badge	Credly allows for stacking of badges (see

	up. The next level is 2500 earners for $13,500/year. Pricing per badge is also available but does not suit our use case.	supports SSO integration.	awarding based on both assignment and module completion. This means that right now it actually has more flexibility than the current Badgr integration, but this is expected to change as Badgr is integrated into Instructure.	above) and badge collections, which are simple sets or groups of badges with no built-in relationships besides belonging to the same group. Again, the software lacks flexible learning pathway functionality.
Badgecraft	**HIGH**	**MEDIUM**	**LOW**	**MEDIUM**
	$550/year for up to 2500 earners	The documentation and user support are less robust.	No Canvas Integration	Badgecraft offers "badge systems," which are essentially similar to stacked credentials and badge collections. These are groups of badges that together can make up a learning program, but they do not offer flexible pathways.

Though none of the platforms offered every feature we would want for this project, Canvas Credentials was the best fit for our defined criteria. Because the LELA program is so flexible, we felt, and program stakeholders agreed, that a feature like Pathways that shows multiple options for achieving leadership development levels was essential to the success of this project.

Design

Even after purchasing the product, however, designing the micro-credentialing system introduced significant challenges. In particular, the high level of learner autonomy allowed in the LELA curriculum required us to set up multiple branching learning pathways to facilitate bundling of credits in a pathways system that could not add up credits. Canvas Credentials, like all the badging platforms we evaluated, offers badges that are binary in nature: a learner has earned a given badge or they haven't. There is no way to make certain badges count for more within a learning pathway aside from creating separate branching paths that "add up" to the same intended value (see Figure 2 for an example). This is a challenge that many educational leaders may encounter if they intend to set up flexible micro-credentialing pathways in curricula that include variable credit-bearing learning experiences.

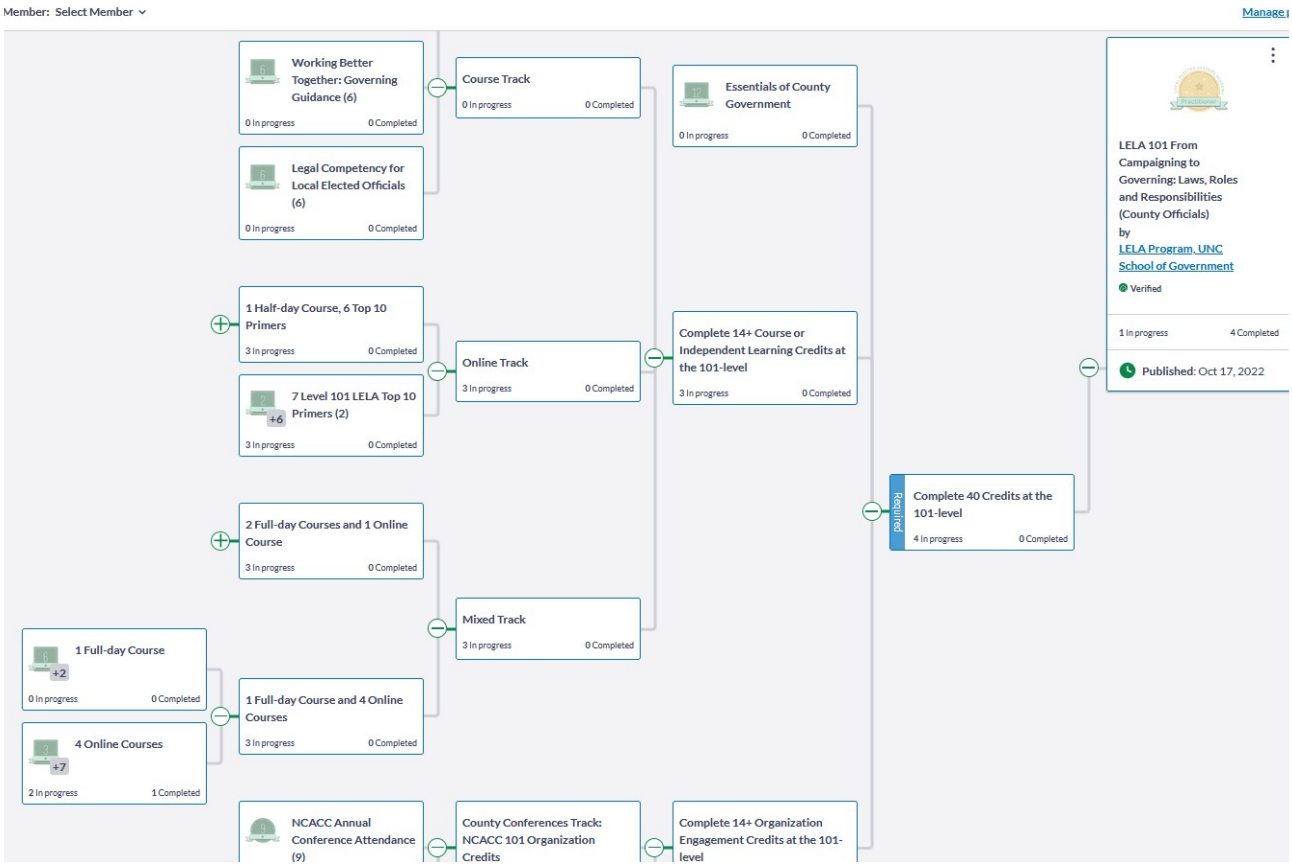

FIGURE 2: PATHWAY EXAMPLE

Another key component of the design phase was the design of a communications plan for the system. Participants in the LELA program range in technological literacy levels, and LELA program leaders emphasized that without clear communication during the rollout of the program, elected officials would be unlikely to engage with the micro-credentialing system. As the first step in putting together communications materials, our team created an initial microsite, training video, and self-guided PowerPoint presentation guiding participants through the program. We then worked with graphic designers and marketing professionals at the School of Government to adapt these materials into a redesigned website for the LELA program and to develop a brief training webinar for interested officials.

Finally, the design phase included a testing component. LELA program officials contacted a set of county commissioners from around North Carolina who were already engaged in the LELA program to participate in a test of the system. For the three county commissioners who agreed to participate, we followed the implementation and communications protocol we had designed, which included a personalized email to each commissioner along with the county clerk who works alongside them. We separately sent emails soliciting their feedback about the program, both informally and by survey.

One key insight gained during this testing phase did not involve feedback from the potential users of the system at all: we found that the clerks were much more engaged with the system than were the commissioners who had received badges. This pattern suggested that we might do well to target communications toward the clerks, who could redeem badges on behalf of their busy commissioners. With this in mind, we conducted a testing session with three county clerks during which they logged into the system on behalf of their county commissioners. The clerks voiced an overall positive impression of the system, and they additionally provided both feedback about which

features they found most helpful and suggestions about how best to communicate about the system. Based on this testing, we made several modifications to the badge designs, communications materials, and implementation plan.

Implementation

Because this project involved introducing a micro-credentialing system as a substitute for an alternative pre-existing system that tracked program credits, a key part of implementation was transferring existing records into the new system. Rather than awarding every badge corresponding to all courses and professional activities LELA participants had completed, we opted to only award the achievement level badges participants had earned along with any badges for activities or courses completed in the past two years. Expecting that some participants might be interested in claiming and sharing badges beyond this initial set, we created a survey that allows participants to claim badges for other completed courses and activities. The survey is self-guided and employs the honor system, allowing participants to select completed activities and receive claim codes for the corresponding badges. While such a system might not work for other programs, LELA program leaders agreed that an honor system, with the potential for occasional audits, would be sufficient for LELA participants.

The implementation phase of the program remains underway, as we are currently preparing to launch the system for the broader group of county officials participating in LELA in August 2023. In addition to a rolling out a redesigned website, which more clearly communicates about the LELA program itself as well as providing user guides and explanations to the micro-credentialing system, we intend to offer a live Zoom-based webinar aimed at county clerks. We will also present the program in August at the annual conference of the North Carolina Association of County Commissioners (NCACC), the professional organization that closely collaborates with SOG staff to operate the county side of the LELA program. Following these initial broad communications, we will send individual emails to each commissioner detailing the program, providing them with instructions for how to view their badges and claim additional badges, and pointing them to further resources. These emails will be copied to the county clerk who works with each commissioner.

In addition to external communications, we are also in the process of communicating internally at SOG about the program. To ensure the success of the program launch, it is important that IT and program management staff be aware of the potential influx of support requests. While we do not expect all 500 county commissioners to immediately engage with the program, even a fraction of that could represent significant additional support needs. In addition, we are communicating about the program with faculty teaching LELA credit-bearing courses and with professional association staff to ensure that future LELA courses and professional activities offer smooth awarding of badges to participants.

Though we feel well-prepared to launch the program, we understand that it is likely to need some changes following August's program launch. For this reason, we intend to continue evaluating the program and updating it based on participant engagement, feedback, and testing.

Discussion

Working on this project has led us to several key lessons that would benefit any team undertaking the design and implementation of a micro-credentialing program. Specifically, we recommend the following:

1. Don't underestimate potential scope and complexity

The development of this program took significantly longer than initially anticipated. Due to a combination of program design complexities, challenges with integrating SOG's single sign-on system with the purchased product, and the high stakes of launching to a powerful learner audience, the project launch was delayed multiple times.

Designing and implementing a micro-credentialing system is a large task, whether it is designed from scratch or is replacing another credit-tracking system, and project plans should accommodate the level of complexity involved.

2. Evaluate products based on specific program criteria

Our decision to purchase Canvas Credentials stemmed from a careful analysis of several micro-credentialing products along dimensions specifically relevant to the LELA program. Other programs with different criteria may reasonably arrive at a different best-fit product, and it is therefore important to clearly define the criteria important to the specific program for which you intend to develop a micro-credentialing system.

3. Elicit the priorities and perspectives of all stakeholders

Any given program has a varied set of stakeholders, each of whom has different priorities regarding a micro-credentialing system. In the case of the LELA program, stakeholders included SOG LELA program staff and faculty, professional association leadership and staff, local elected officials in North Carolina including county commissioners, and county clerks. Understanding the needs of each of these groups, their current relationship with the LELA program, and the ways they might expect to engage with a new micro-credentialing system, was essential in designing a system that will adequately serve its users.

4. Grant initial badges to bring participants into the system

While this project required some initial assigning of badges due to the micro-credentialing system's role as a replacement of a previous system, this is a practice we would recommend even for new programs. Not only does awarding a learner a badge immediately offer them a way into the system, it can act as an incentive to earn more, particularly if (when using a program like Canvas Credentials) it can place them at the beginning of a learning pathway they can explore. It also removes the barrier of the initial "opt-in" phase otherwise required when, for example, a learner is instead offered as their first interaction with the system a badge claim code that they may not end up using.

5. Include multiple testing cycles

Iterative testing is an essential element of designing and implementing a micro-credentialing system. We engaged in testing at multiple points throughout this project: during the evaluation of potential platforms and the design of the system, we conducted multiple informal tests and demonstrations with LELA program leadership; once we had developed a strong initial design we tested the system with county clerks. We intend to continue evaluating and revising the program after launch, including any needed testing of revisions. Only with adequate testing is it possible to ensure that stakeholder assumptions, needs, and perspectives are understood and incorporated into the design (see point 3 above).

Conclusion

While this case study is perhaps unique in its combination of setting, learner audience, and system complexity, we believe the process described in this paper could provide valuable insights for those interested in implementing micro-credentialing programs in a wide variety schools, training programs, or other learning environments. One important takeaway is, indeed, that any given program is unique: even when using an out-of-the-box micro-credentialing product, there will be specific elements of the program that inform the design of the system that employs that product.

During our evaluation of competing micro-credentialing products and vendors, we were surprised to find that none offered the specific combination of flexible learning pathways and variable credit counts we were seeking. Such a combination is certainly not unheard of in the design of educational programs themselves: programs often provide learning opportunities that award varying numbers of program credits, and they often allow significant flexibility in the ways learners can combine courses or learning opportunities to reach a goal. There is therefore a gap in the micro-credentialing market for a product that both allows for micro-credentials to vary in credits or some other value and provides the opportunity to define flexible learning pathways.

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