How Might Digital Micro-Credentials Help Youth Aspiring to Go to College?
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Rapid Community Reports
Workshop Outcomes
How Might Digital Micro-Credentials Help Youth Aspiring to Go to College?

The goal of the workshop described in this report was to engage participants from informal programs, secondary and higher education, and badge issuing organizations in developing projects that move the needle on using micro-credentials to support STEM pathways for underrepresented youth.

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Abstract
The Informal Ed to Higher Ed (IE2HE) workshop (December 2019) focused on how digital micro-credentials earned in informal educational experiences could be used in college admissions. Key issues raised included the need to create shared meaning for micro-credentials across institutions, to explore how endorsement can be used to enhance the value of micro-credentials, and the need for a resource that maps connections within the micro-credential ecosystem. Suggestions for future work included leveraging community colleges to build connections between informal education programs and four-year colleges, the use of participatory endorsement to build cross-institution relationships and youth agency and using social network analysis to visualize the connections across institutions in the micro-credential community to learn from existing efforts to prepare youth for next steps on career pathways.

Keywords
Digital micro-credentials, informal education, higher education, college-readiness

Introduction

The college admission process privileges wealthy families by placing a high value on skills (music, sports, arts, standardized test taking) that are often expensive to develop, and by prioritizing applicants from well-resourced high schools over those from poorly-resourced schools (Carnevale & Strohl, 2013). This is one reason why only 9% of students in the lowest 25% income bracket earn degrees from four-year colleges, while 77% of students from the top 25% income bracket do (Cahalan et al., 2016). Providing low-income youth with innovative and challenging informal learning experiences can help address this inequality. However, to make a real change, these youth must also have the tools to communicate the value of those experiences to college admissions officers, who will then recognize and accept those credentials in college applications. Co-design of micro-credentials by youth development organizations and higher education faculty is one strategy for providing these tools to young people.

“A micro-credential is a short, competency-based recognition that allows an educator to demonstrate mastery in a particular area” (NEA). Credentialing formal and informal learning with something like badges has been around since the 1980s (Grant, 2016). Decades later, in 2007, James Gee, “pitched the idea of digital badges as alternative credentials based on how video games use them to mark progress” (Grant, 2016). From there the MacArthur Foundation funded Mozilla to design a massive decentralized open badge infrastructure (OBI) (Grant, 2016). A National Science Foundation (NSF)-funded workshop held at the University of Michigan, in May 2017, started a conversation about how digital micro-credentials—a digital form of certification indicating demonstrated competency/mastery in a specific skill or set of skills (NEA, 2019)—earned in informal education programs could be used in the college application process to address issues of equity (Fishman et al., 2019). One of the informal education organizations that was featured in that workshop was Mouse, a national nonprofit that provides creative technology programs, curriculum, and digital micro-credentials for middle and high school-age youth. Representatives from that organization described their partnership with Parsons School of Design to co-create a set of micro-credentials that youth could earn in an informal digital design program. This required program developers to work with Parsons faculty to align the curriculum and micro-credentials to a Parsons introductory course, to ensure that youth in the program learned the content and skills that a well-respected design institution would value. This work was supported through an NSF-funded project called Investigating...
Digital Badges as Alternative Credentials to Broaden STEM Participation Among Underrepresented Youth (DRL-1614727), which began in September 2016.

Building on the University of Michigan workshop and what has been learned from the NSF project, Mouse, Parsons, and their research partner Education Development Center (EDC) received NSF funding for the Informal Ed to Higher Ed (IE2HE) workshop, which was held at Carnegie Mellon University in December 2019. The purpose of the workshop was to engage representatives from other informal education programs and higher education institutions to come up with strategies for ensuring that micro-credentials earned in informal programs can be recognized in the college admissions process, using the Mouse/Parson’s collaboration as a useful model.

We recognized that there are other important conversations to be had around micro-credentialing, (e.g., whether micro-credentials are the best way to credit and acknowledge work being done in informal spaces, how to assess and evaluate micro-credentials and their systems, which micro-credentials would work best for under-represented youth, and so on). This convening was not intended to answer those questions but instead brought together small teams based on interest and capability to take actionable steps towards developing a micro-credentialing system that would connect informal STEM programs with the next steps on college and career pathways within their own communities. To achieve this goal the workshop focused on these questions:

- What type of information do higher education faculty and admissions need for informal learning experiences to be valued on par with other credentials currently accepted in admissions?
- What type of information do informal STEM program providers need in order to design and deliver programs that prepare underserved youth for successful college applications?
- What can we learn from existing digital micro-credential initiatives that are already partnering with universities?

The workshop produced three important takeaways:

- Align micro-credentials from informal programs to higher education courses or other programs on the college and career pathway to make them meaningful across institutions.
- Build relationships with institutions at various points along career pathways through participatory endorsement—that is a process by which relevant stakeholders co-design and provide their backing to micro-credential(s)—of digital micro-credentials earned in informal programs.
- Create an online resource that provides a visualization of the connections between informal programs and higher education institutions in the digital credentialing community so that informal programs can learn about and build on work that is already taking place.
Workshop attendees

The IE2HE workshop brought together stakeholders in the alternative credentialing enterprise who can make change happen. The event included 22 participants representing four workgroups: faculty from two- and four-year institutions, providers of informal and formal learning experiences for youth, micro-credential developers and issuers, and educators with experience implementing micro-credentials. Every participant was invited with the intention that they could generate ideas for moving the field forward by working together on innovative and interconnected projects.

Two groups of attendees were invited based on their geographical proximity, with the hope that they could work together to create integrated IE2HE pathways for youth in specific locations. The New York group consisted of representatives of the organizations that presented at the Michigan conference, namely Mouse and Parsons School of Design as well as The DreamYard Project—a youth development organization in the South Bronx that runs a school as well as informal programming—Hostos Community College located near DreamYard; and Cooper Union, an Art and Engineering college with a pre-college program. The Pennsylvania group included representatives from Drexel, Carnegie Mellon, and the University of Pittsburgh, and from youth-serving organizations such as Remake Learning, Carnegie Library of Pittsburgh, and UPMC Hillman Academy, which provides research experiences for high school students on the University of Pittsburgh campus. These groups all have the goal of helping low-income high school youth in their communities enter STEM programs in higher education. The convening gave them a chance to learn together as well as connect and plan collaboratively.

In addition to these place-based groups, we invited other key stakeholders to get a range of perspectives on the opportunities and challenges of using alternative credentials to support youth through the transition from high school to college. To provide context on the state of micro-credentialing research, we invited researchers from the University of Michigan, Indiana University, Olin College, and the University of Washington. To provide an update on where the field is policy-wise and technically as it relates to issuing micro-credentials, representatives from Credly and OpenWorks Group participated in the workshop. We also brought in an expert in college admissions from Collegewise and a representative of Competency X, which issues micro-credentials for student internships.
Workshop structure

The convening lasted two days. The first day set the stage by presenting the need for alternative credentials to address inequalities in post-secondary education opportunity, and current research and projects involving digital micro-credentials that the attendees should know about and build upon when conceptualizing solutions. Day two focused on thinking about the key questions that future work would need to address, and then gathering in small groups to plan concrete next steps.

To provide a framework for discussions, Davin Sweeney, Director of College Counseling at Collegewise presented an overview of the state of college admissions. His presentation centered on how college and university admissions fail to meet the needs of traditionally underrepresented students.

Following this orientation, representatives from Mouse, Parsons, and DreamYard presented their NSF-funded digital micro-credential initiative, in which they co-created a set of micro-credentials that youth earn in an informal program called Design League. These badges were “endorsed” by Parsons, which enhanced their value as credentials in applications to Parsons and potentially other art and design colleges. The Mouse/Parsons partnership provided workshop attendees with a model for the type of informal ed/higher ed partnership that groups could consider replicating or use to inform their own efforts. This model was critical to the ultimate goal of the workshop. We tried to provide a successful and concrete example of steps informal and university partners could take to acknowledge the work that is happening outside of school.

Next, Barry Fishman and Stephanie Teasley of the University of Michigan presented six themes that surfaced as important from their Digital Micro-Credentials workshop (2019): Equity, Lifelong Learning, Validity and Endorsement, Agency and Authenticity, Scalability, and Infrastructure. Workshop organizers encouraged participants to think about how each theme related to their work.

Daniel Hickey of Indiana University presented research that he conducted on digital badge projects funded by the MacArthur Foundation’s Digital Media and Learning initiative. Professor Hickey described four different types of badge systems: competency-based, inquiry-based, participation-based, and hybrid, with the most successful of these being participation-based (Hickey & Shenke, 2019). Alec Barron of Competency X presented on an assessment practice for workforce-informed performance tasks that is currently being used at Del Lago Academy in Escondido, California.
The last part of Day One focused on groups coming together around topics of interest: Endorsement Partnerships, Guidelines/Advocacy, and Participatory Endorsement.

On Day Two participants engaged in a “World Cafe” activity—this workshop method is a creative process for leading collaborative dialogue, sharing knowledge, and creating possibilities for action in groups. The technique brings together individual ideas into one comprehensive message—The participants were asked to think through four questions that are important to digital micro-credentialing work:

- Who are the stakeholders that have to be involved to reassess how various kinds of credentials in applications/portfolios are valued by undergraduate institutions?
- How can stakeholders overcome the technical and administrative obstacles that perpetuate inequalities that currently exist in the process of high school to higher education admissions and transitions?
- How can endorsed badges be used to connect prospective students to faculty early in the application process, and to other opportunities offered by an institution, such as summer camps or research?
- How can this work be communicated to the informal STEM and higher ed admissions fields?

Finally, based on conversations and discussions, at the end of Day Two, there were four workgroups formed. The groups formed based on a set of shared values and work they would like to move forward. The groups were: New York Region, Pennsylvania Region, Social Network Analysis, and Participatory Endorsement. We concluded the convening with a share-out of the proposed work each group would continue over the next two months.
Key issues

Workshop attendees discussed the potential for using micro-credentials earned through informal education programs to support underserved youth along college and career pathways, as well as the obstacles to their use. Micro-credentials have the potential to validate the experiences youth have in out-of-school settings. The attendees identified some of the key issues that need to be addressed and noted how some of the initiatives and research shared at the workshop offered possible ways to address these issues.

Creating cross-institutional meaning for micro-credentials

One of the issues that has been a consistent challenge with micro-credentials is how to give them meaning beyond the context of the issuing organization. Informal programs may put a great deal of effort and thought into designing digital credentials that signify skills or accomplishments within their programs, but those may not have value to the organizations or institutions that are the next steps on a college or career pathway.

The Mouse/Parsons endorsement partnership presented one potential model of how to build cross-institutional meaning for micro-credentials. By co-creating a digital badge system with Parsons that aligned with their introductory Human-Centered Design course, Mouse enhanced the value of the credentials but also ensured that its Design League program was, in fact, introducing youth to terms and practices that would be recognized by art and design school admissions officers and faculty if and when students applied, even if those colleges did not accept the formal credentials.

At the workshop, representatives from other programs agreed that close alignment of micro-credentials with next steps—whether that be college, an internship, a pre-college program, or a work-study position—could help establish a shared understanding of the meaning of the credentials among the issuer, the earner and the institutions they might hope would accept or value them. While informal program developers often are focused primarily on the quality of their particular program, ensuring alignment of program activities with next steps could make the credentials that participants gain in these programs more meaningful for their education and career goals in the long term.
Exploring possibilities for participatory endorsement

Participatory endorsement is based on the idea of an open recognition of situated learning by partners, in this case, learning that occurs within informal spaces. Open recognition would allow outside partners to recognize and verify the work done by learners in programs that issue micro-credentials. For example, Organization A could endorse (publicly through their website) and grant credit for a youth participating in experiences from Organization B. Some workshop attendees expressed their interest in using endorsements from micro-credential earners and partner organizations as a way to add value to digital credentialing systems. The idea was inspired by the new technical specifications for digital micro-credentials, Open Badges 2.0, which allows for endorsements of what the micro-credentials represent from outside organizations and people. This structure would allow programs that issue micro-credentials to design their system to, for example, include open recognition of situated learning within internships, or to establish Research Practice Partnerships that include open recognition of micro-credentials across partner organizations. It also gets at the issue of “credibility of badges” by providing third-party validation that can be formal or informal. Participatory endorsement could also enable youth participants in programs or internships to serve as endorsers as well as earners of micro-credentials. Moving the field forward in this area would likely require the development of the socio-technical infrastructure needed to facilitate the process as well as guidelines and normative practices for participatory endorsement.

Sharing resources across communities

The workshop highlighted for many the amount of work that is already going on across the field of micro-credentials in formal education and workforce preparation and training. Attendees expressed the need for a resource where information about these different initiatives could be found and where best practices for alternative credentialing are shared.

Workshop attendees from Drexel and Carnegie Mellon University are creating a targeted resource for sharing information about informal and pre-college computer science programs that issue micro-credentials. This kind of resource could be a first step, but other organizations and researchers could develop networks within their own ecosystems to display the opportunities for youth and develop a recruitment database for informal organizations and higher education institutions. This has the potential for making explicit the pathways certain youth take as they move from high school to higher education and providing valuable data for program developers as well as researchers interested in studying youth development.
Recommendations for future work

This workshop was organized to help this community reflect on what we have learned thus far and conceptualize next steps. Below, we summarize the main takeaways from the workshop, the work done afterward, and discuss potential ways forward. These takeaways synthesize the most valuable and relevant pieces of work across the four groups.

Leverage community colleges to connect informal and higher education

As noted in the key issues section, aligning micro-credentials from informal programs to higher education courses or other programs on the college and career pathway can make micro-credentials more meaningful generally across institutions. Community colleges potentially can be leveraged to provide a concrete connection between informal programming and four-year colleges. The New York group has established a model for an affordable digital media career development pathway for underserved youth. Hostos, a community college in the South Bronx which offers Digital Design and Animation, Digital Music, and Game Design degrees, is planning to give college credit for digital micro-credentials earned in Mouse’s Design League program, giving those credentials a real monetary value. Parsons and Hostos are now working on an articulation agreement for all credits from Hostos to be accepted into Parsons’ Integrated Design major, enabling Hostos students to earn a Parsons degree. Rather than having the traditional process of attending two years at Hostos and two years at Parsons, students will be able to move more gradually into Parsons courses, thereby providing students with the support of the smaller community college environment for a longer period of time while also keeping the cost down. Other informal programs that issue micro-credentials can reach out to community colleges that offer degrees in the topics their programs focus on to see how they might be able to grant credit for credentials. They can then draw upon the community college’s existing relationships to four-year colleges to establish achievable higher ed pathways for their participants.
Create partnership networks through endorsements

Trust and credibility of micro-credentials is a consistent and vocalized challenge. Youth development organizations and programs have already recognized the need to create partnership networks, such as The Hive Learning Network NYC (a city-wide learning laboratory for educators, technologists, and mentors to design innovative connected educational experiences for youth), to share resources and expertise, as well as to support youth across contexts. One concrete way to solidify connections among these organizations at various points along career pathways is through participatory endorsement of digital micro-credentials earned in other informal programs in the network.

Digital micro-credentials can contain information about an endorser as well as about the earner and the issuer. Participatory endorsements would let participants who earn micro-credentials in one program to learn about other opportunities that are available through the information contained in those credentials. In addition, the endorsing organizations could use their endorsements as a way to recruit youth that have a demonstrated interest. This technique could enhance the credibility of the micro-credentials because multiple organizations are willing to validate them.

Future research could look at what it means to have multiple organizations endorse the same micro-credentials, for example, to have universities endorse other universities’ pre-college programs. This could also provide an opportunity for youth to endorse programs and signal to other youth exciting and interesting opportunities.

Develop a micro-credential landscape map

To address the need for programs to learn from the micro-credential community, one important piece of work would be the creation of an online resource that provides an overview of the state of micro-credentials and that visualizes the connections across the digital credentialing communities. Such a resource could be used by informal programs, higher education administrators, and policy makers to understand how micro-credentials can benefit youth in college and career readiness. This would involve querying credential engines about different micro-credential issuers and reviewing IMS Global’s efforts to standardize the micro-credential infrastructure. Aspects of their code could be used to search and categorize micro-credentials. The next step would be to conduct a Social Network Analysis (SNA) to create a map of the micro-credential landscape. This map would allow programs to find micro-credentials that are similar, provide an opportunity for the community to look for outcomes, and identify gaps in what we know. The goal would be to produce a visualization similar to what Digital Promise did with their Research Map of Learning Sciences Research: https://researchmap.digitalpromise.org/views/network/.
References


Resources

Competency X: https://www.competencyx.com

Digital Promise Micro-Credentials: https://digitalpromise.org/initiative/educator-micro-credentials/

Credly: https://info.credly.com

No Such Thing: Education in the Digital Age Podcast: https://www.stitcher.com/podcast/marc-lesser/no-such-thing/e/66262659

Acknowledgments

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Appendix 1

Workshop Participant List

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<thead>
<tr>
<th>Participant Name</th>
<th>Institutional Affiliation</th>
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<tbody>
<tr>
<td>Alaine M. Allen, EdD</td>
<td>University of Pittsburgh</td>
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<tr>
<td>Alec Barron, EdD</td>
<td>Competency X, Escondido, CA</td>
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<tr>
<td>David Boone</td>
<td>University of Pittsburgh</td>
</tr>
<tr>
<td>Katie Davis, EdD*</td>
<td>University of Washington</td>
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<tr>
<td>Anne Gaines, MFA</td>
<td>Parsons School of Design</td>
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<tr>
<td>Jaime Gutierrez</td>
<td>EDC</td>
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<tr>
<td>Daniel Hickey, Ph.D</td>
<td>Indiana University</td>
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<tr>
<td>Hillary Kolos</td>
<td>The DreamYard Project</td>
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<tr>
<td>Kerri Lemoie</td>
<td>OpenWorks Group</td>
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<tr>
<td>Carlos Leon</td>
<td>Mouse</td>
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<tr>
<td>Pat Leonard</td>
<td>Credly</td>
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<tr>
<td>LaTrenda Leonard Sherrill</td>
<td>Remake Learning</td>
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Appendix 2
Workshop Agenda

Informal Ed to Higher Ed (IE2HE) Workshop

December 2-3, 2019
The Carnegie Mellon University

Agenda

DAY 1
9:00 - 10:00 am
Registration and Breakfast
Scavenger Hunt
Table Discussions

10:00 - 10:30 am
Opening Session:
Welcome & Roll Call
Wendy Martin (EDC)

Agenda Overview
Carlos Leon (Mouse)

Morning Make: Activity
Maggie Muldoon (Mouse)

**Session 1: Big Picture**

The State of Higher Ed Admissions  
*Davin Sweeney*

Identifying Shared Priorities  
*Wendy Martin (EDC)*

**Story of Mouse & Endorsement Partnership Model**  
*Jessica Walker (Parsons), Anne Gaines (Parsons), Maggie Muldoon (Mouse), Hillary Kolos (DreamYard), Marc Lesser (National Academy Foundation)*

Stakeholder Small Groups - Making Change Happen  
*Carlos Leon (Mouse)*

**Session 2: Stakeholder Responses & Perspectives**

*Anne Gaines (Parsons) and Hillary Kolos (DreamYard)*

**Activity**  
*Maggie Muldoon (Mouse)*

What Can We Learn from the Research/Participant Experience?  
*Marc Lesser (National Academy Foundation)*

3:30 pm  
**15 min break**

**Session 3: Reflection on Initial Plans**

*Carlos Leon (Mouse)*

**Activity**  
*Maggie Muldoon (Mouse)*

DAY 2

9:00 am - 11:00 am  
**Session 3: Reflection on Initial Plans**  
*Carlos Leon (Mouse)*

**Activity**  
*Maggie Muldoon (Mouse)*
Whole Group Share out of Small Group Work  
*Carlos Leon (Mouse)*

11:00 am - 12:30 pm  
**Session 4: Design Charrette to Plan for Projects**  
*Julie Poncelet (Evaluator)*

12:30 pm  
*Lunch*

1:00 pm  
**Session 5: Drafting Team Action Plans**  
*Wendy Martin (EDC)*

2:30 pm  
*10 min break*

2:40 pm  
**Group Reflection**  
*Carlos Leon (Mouse)*

3:30 pm  
**Closing Session**  
*Wendy Martin (EDC)*  
*Carlos Leon (Mouse)*