Makerspace Workshop Badges: Student Perceptions & Uses of Informal Credentialing

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Introduction

The University of Victoria Libraries' Digital Scholarship Commons (DSC), a library based makerspace, taught over 20,000 workshop participants between April 2017 and July 2022. Over 1,300 of those participants earned an informal credential, or digital badge, for the successful completion of one of 40 different DSC workshops [1]. These credentials are informal in that they are not recognized as official university credits that count towards the completion of an academic degree. The Badgr.com service was used to award and manage the digital badges that conform to the Open Badge standard [2].

The informal feedback we have received from learners has been positive, but more systematic feedback was desired to determine if the time and effort put into this pilot project was warranted and if the informal credentialing program could be improved to better meet the needs of makerspace workshop participants.

To date, little research has been published exploring how users of academic makerspaces are using their informal credentials. In order to help fill this gap in the literature, this descriptive research project employed a mixed-methods approach to discover learner perceptions and uses of their informal DSC credentials or digital badges.

Fig. 1. A badge for an Introduction to 3D Printing workshop.

The following Research Questions are addressed in this paper:

RQ1. How many students participating in library makerspace workshops are requesting informal credentialing?

RQ2. Are recipients using their informal credentials in their job searches?

RQ3. Do students perceive their informal credentials as being helpful in their job search?

RQ4. Can the current form of informal credentialing be changed or improved to better meet their needs?

Key findings from this paper include:

- 23% percent of drop-in workshop participants earned a makerspace badge for successfully demonstrating the skills they developed in the workshop.
- 90% of makerspace badge earners who used their badges in a job search believe that the informal credentials helped them secure a job.
- 75% percent of all makerspace badge earners planned on using their badges in future job searches.
- The UVic Libraries DSC badging program could be improved by including more detailed instructions on how to use badges in job searches.

Literature Review

Informal credentials or digital badges can assist people in showcasing their skills and learning to others. According to Gibson et al., a digital badge is a representation of an accomplishment, interest, or affiliation that is visual, available online, and contains metadata including links that help explain the context, meaning, process and result of an activity [3]. For instance, "it is helpful to think of a digital badge as a micro-credential, similar to a boy or girl scout badge, that certifies skills at a more granular level than grades or transcripts" [4].

Credentialing is an important step that marks a key milestone in one's learning journey. Informal credentials "give students a way to describe their learning journey" [5]. Degrees and letter grades demonstrate the outcome accomplishment (summative) without showcasing skill development and the learning process (formative) acquired throughout the program. Instead of paper certificates, "the information on a digital badge is stored electronically, providing a much easier mechanism to search for the information and verify that it is correct and accurate," which can be particularly useful when applying for jobs online [6]. Digital badges can help make learning more personal and provide a means for students to be recognized beyond letter grades and degrees to better represent the learning and skills they have mastered [7].

Academic makerspaces are beginning to use informal credentials, typically in the form of digital badges, to help participants communicate to employers the skills they have developed. The California Community Colleges Maker Initiative is a leader in this area and awards micro-certificates, or digital badges, to individuals who have successfully mastered specific makerspace skills [8]. Arguably, the increased use of informal credentials by makerspaces will "complement traditional credentials and increase students'

marketability and employment opportunities" [9].

Methods

A mixed-methods approach to this research topic was taken, with an exploratory survey sent to all DSC workshop badge recipients. Follow-up semi-structured qualitative interviews were conducted with a subset of survey participants to explore topics in greater depth.

A. Quantitative analysis

In the spring of 2021, survey invitations were sent to all 882 workshop participants who were awarded informal credentialing or digital badges for completing DSC workshops (N=882). 69 learners responded to the survey (n=69). Given the population and sample sizes, the confidence interval for the survey questions is +-11% with a 95% confidence level (z=1.96). The survey questions can be found in Appendix A and the anonymized survey data in Appendix B. An analysis of the data was conducted to generate descriptive statistics for each research question.

B. Qualitative analysis

All 69 survey respondents were asked to participate in a follow-up interview, and the first 15 of the respondents were interviewed to further explore their perceptions and uses of the badges they earned. The interview questions are in Appendix C, and the anonymized interview transcripts, including any follow-up questions asked, are in Appendix D.

Fig. 2. Word cloud of interview text. Source: Primary

The 15 interview texts were analysed and coded using the Open-source qualitative analysis software Taguette. This was done to identify and quantify major themes and ideas along with representative quotes from workshop participants [10].

Results

In order to answer the research questions below, including determining how many DSC workshop participants earned informal credentials, how many of them used their badges in some way, and what their perceptions of their informal credentials were, the following analysis was done using the quantitative and qualitative data gathered:

- Descriptive statistics were calculated using workshop attendance data and badge award data.
- Descriptive statistics on how badges earners have used their badges in job searches were calculated using learner survey data, and quotes were coded and identified from qualitative interviews.
- Descriptive statistics on how badge earners perceive their badges were calculated using learner survey data, and quotes were coded and identified from qualitative interviews.
- Quotes were coded and identified from qualitative interviews from badge earners to gain insight into how the DSC badging system could potentially be improved.

RQ1: *How many students participating in library makerspace workshops are requesting informal credentialing?*

An analysis of DSC workshop registration data and DSC badge data between April 2017 and February 2021 showed that a total of 12,498 learners participated in DSC workshops and 882 earned badges for successfully completing the respective workshop learning objectives. In percentage terms, 7% of all workshop participants requested and earned badges. A large majority of badge earners participated in drop-in workshops rather than workshops held at the request of instructors in their for-credit classes. When looking at just drop-in workshops, the percentage of learners who requested and earned badges jumped to 23%.

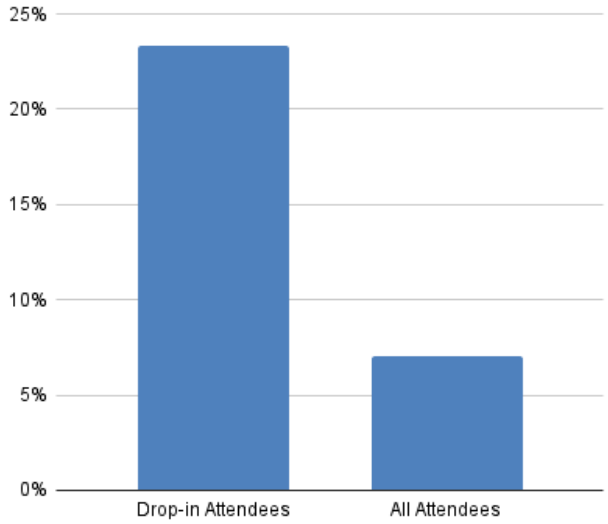

Fig. 3. All workshop attendees from April 2017 to March 2021 who earned based vs Drop-in workshop only attendees who earned badges.

In terms of informal credentialing or badge accessibility, it is important to note that the learners earning badges are coming to DSC workshops from faculties and departments across campus and not just the Engineering and Science departments. For example, in 2021 the departments that had the highest number of DSC workshop attendees were: Education, Business, Anthropology, Engineering, Psychology, Humanities, and Gender Studies. It should be noted that several Education faculty members have integrated DSC workshops into their for-credit-class syllabuses and

invite DSC staff to lead workshops for their classes every semester.

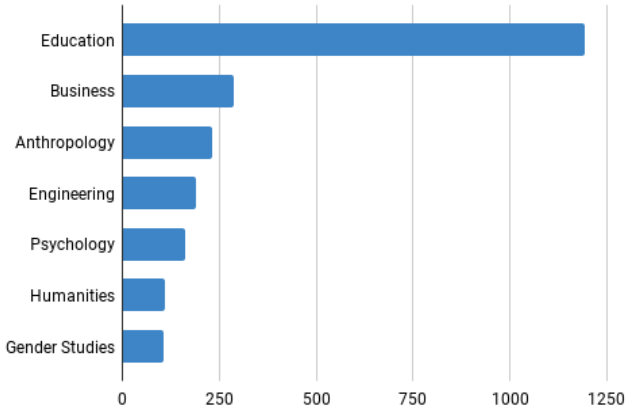

Fig. 4. DSC Workshop Attendees by Department in 2021.

RQ2: *Are recipients using the credentials in their job searches?*

Of the 69 survey respondents, 15% used the badges they earned in at least one job search. Seven of ten included badge information on their resume, three on the cover letter, one verbally in a job interview. All ten included their badges on their LinkedIn profiles.

When all survey respondents were asked if they would use their badges in future job searches, 74% responded that they would include their badge in their resume, cover letter, or LinkedIn profile.

In terms of where badge earners referenced or used their informal credentials, by far the most popular location is LinkedIn at 100%, followed by citing them on their resumes at 70%, and 60% mentioned the badges they've earned in conversations with classmates, friends, or family members.

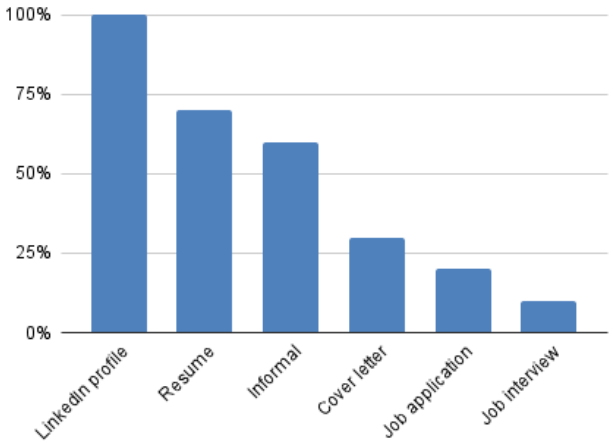

Fig. 5. All the places where you mentioned or have used your badge.

The following quotes from badge earners highlight the main reasons they used, or would like to use, badges or informal credentials in their future job searches:

- "[My badges] helped me land interviews. [They have] been a really useful job search tool for me." - Undergraduate student
- "I think it's one thing to say that you know [how to do something at] the bottom of your resume where you write about your skills and abilities, [and] it's another thing to be able to show [the badges you have earned] that [certify that] you have those skills. I think that this is probably the most useful aspect of [digital badging]; it's proof, it's evidence." - Graduate student
- "There is no avenue within our department for getting any kind of formal certification or quantification for specific skills." - Undergraduate student
- "I think a lot of people embellish their resumes. Including DSC badges on your resume adds more credibility to the skills claims that you make. The credibility that badges give you is for me their biggest benefit." - Undergraduate Student

RQ3: *Do students perceive their informal credentials as being helpful in their job search?*

Of the ten learners who used one or more badges in a recent job search, 90% agreed or strongly agreed that it was helpful, and the final 10% were not sure if it helped them or not.

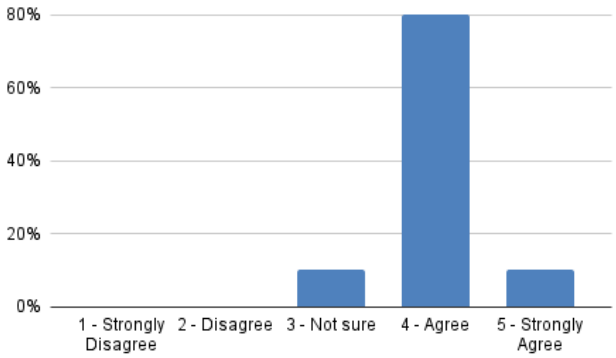

Fig. 6. The Digital Badge I earned was helpful in my recent job search.

One graduate student badge recipient stated that, "I think [my badge] was one of the reasons I got an interview for the co-op that I'm now working at."

RQ4: *Can the current form of informal credentialing be changed or improved to better meet their needs?*

While overall survey and interview respondents reported being happy with the DSC badging program, they did offer several suggestions for improving the informal credentialing system to better meet their needs. Below are representative highlights of the range of suggestions they made:

- "Stacked micro-credentials that could build an "uber badge" would be nice." [11] - Undergraduate student
- "I think the badges are only helpful if potential employers are familiar with the requirements to earn one, without accreditation or other external validation a certificate like this is not very helpful because it hard for employers to really assess what this accomplishment means." - Graduate student
- "I think that it would be cool if there were options to have the badges act as a co-curricular credit. The design to showcase UVIC accreditation." - Undergraduate student
- "[The digital badge] should use a University of Victoria logo somewhere." - Undergraduate student
- "More clarity on how to put this "badge" on a resume, or if it does at all." - Undergraduate student

Discussion

Overall feedback from learners who earned workshop badges was positive, with 90% of badge earners who used a badge in a job search believed that it helped them. That said, several interviewees mentioned areas of the badging program that could be improved, including more detailed instruction on how to include badges in different communications media during a job search, and ensuring that there is strong institutional branding on the digital badges themselves.

A. Research questions

RQ1 - How many students participating in library makerspace workshops are requesting informal credentialing? 7% of all workshop participants earned badges and 23% of drop-in participants earned badges. It appears that students who participated in workshops as part of for-credit classes were significantly less likely to request a badge after successfully completing a workshop. Why this was the case is not explored in this study, but it might be that drop-in participants who chose to participate in a workshop were more motivated to learn and earn an informal credential, as opposed to class based participants who are essentially required to take the workshop as part of their for-credit classes. Additional research should be conducted to address this question more fully.

RQ2 - Are recipients using the credentials in their job searches? 15% of survey respondents indicated that they used their badges in a job search and 74% stated that they would use their badges in future job searches. Badge earners cited their informal credentials on LinkedIn (100%), their resumes (70%), and talked about their badges in conversations with classmates, friends, or family members (60%). As one undergraduate student stated, "[my badge] helped me land interviews, [and has] been a really useful job search tool for me."

RQ3 - Do students perceive their informal credentials as being helpful in their job search? Of the ten badge recipients who used their informal credentials in a job search, 90% agreed or strongly agreed that the badges were helpful. As one graduate student reported, "I think [my badge] was one of the reasons I got an interview for the co-op that I'm now working at." While this result is very encouraging, it should be noted that the sample size for responses to these questions was small (n=10).

RQ4 - Can the current form of informal credentialing be changed or improved to better meet their needs? Some of the key suggestions from badge recipients include:

- Include instructions on best practices for citing badges in places other than LinkedIn, including on resumes, cover letters, and portfolio websites to make it easier to let potential employers know about the skills badge earners have developed.
- Work with campus employment services and co-op departments to develop promotional materials about the DSC badging program and then distribute the materials to employers. The goal would be to help employers better understand what digital badges are and how to quickly identify the specific skills a student developed to earn a given badge.
- Identify related badges that could be grouped to offer summative, stacked, or "uber" informal credentials to communicate a broader level of competency in broader areas of expertise.

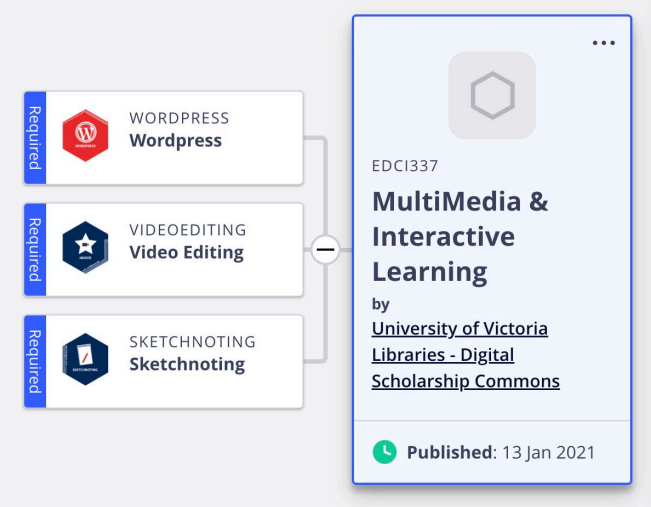

Fig. 7. An example of badge-stacking or an uber-badge in the Badger.com microcredential platform.

- Encourage professors who invite makerspace instructors to run workshops for their for-credit classes to give their learners the option to earn a badge for the successful completion of the workshop. This will allow learners to more easily communicate to employers the specific skills they gained in their classes.
- Whenever possible, ensure that badges include recognizable branding elements so that it is obvious the badge was awarded by a makerspace attached to a university or college.

B. Limitation and directions for future research

While the overall number of survey respondents (n=69) was adequate to provide a confidence interval of +-11% for many survey questions, a limitation of this study is the small sub-sample of badge earners who used their informal credentials in a job search (n=10). This means that the survey questions about how badge earners use their informal credentials for job searches are not as definitive as desired. Further research should be undertaken to obtain larger sample sizes to better understand badge use in job searches.

Survey participants earned their informal credentials at a university library makerspace, which serves students from faculties and departments across campus. Academic makerspaces that serve specific departments on campus, like engineering or fine arts for example, might produce different results. Further research should be done to explore this possibility.

To facilitate the replication of this research study, the qualitative and quantitative research instruments were made publicly available under an open licence. Other institutions who are also interested in measuring student perceptions and uses of their informal credentials will be able to take advantage of these resources. The survey questions can be found in Appendix A, and the interview questions can be

found in Appendix C.

C. *Summary and principal implications*

Despite the limitations outlined above, this research study found that 9 out of 10 badge earners who used their badges in a job search, believed that their informal credentials helped them find employment. 75% of the 69 survey participants stated they planned on using their badges in future job searches.

As such, it appears that informal makerspace credentialing programs are valued and used by learners who choose to earn makerspace badges. Academic makerspaces should give careful consideration to their specific circumstances in order to help determine if implementing an informal credentialing system would assist their learners to better communicate the skills they have developed to potential employers.

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