

Microcredentials and work-integrated learning

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Student performance evaluations are a traditional method for assessing a student's skills during a work-integrated learning (WIL) experience. While these assessments provide students with feedback on the development of their skills, little documentation of student performance exists after the WIL experience. This paper explores the role of microcredentials in evidencing student competence in a particular skill through two studies conducted at the University of Waterloo. First, students and employers were surveyed to investigate their perceptions of microcredentials. Second, semi-structured interviews were conducted with students who had the opportunity to earn a microcredential based on their performance in their co-operative education (co-op) work term and in the professional development courses that accompany their work term. Findings suggest that awareness of microcredentials remains limited. In terms of their value, there is evidence consistent with Bourdieu's theory of capital. Microcredentials appear to signal value to employers and students through the credential itself. However, aligning with human capital theory, microcredentials appear most valuable when they demonstrate both knowledge acquisition and competency. Finally, the value of obtaining a microcredential appears to motivate students to exert greater effort towards content mastery.

Keywords: microcredentials, work-integrated learning, alternative credentials, student, employer

The growing expectation for graduates to develop work-aligned skills by the time they enter the job market is apparent (Gallagher, 2018). This raises the question as to how students can present evidence of specific competencies that cannot be exclusively represented by traditional academic credentials.

The emergence of alternative credentials has provided learners with opportunities to earn certification in a variety of skills. Despite alternative credentials gaining increasing recognition and legitimacy in recent years (Newby & Cheng, 2020), their implementation in higher education remains limited. However, there are several connections between work-integrated learning and microcredentials that suggest the potential for incorporating microcredentials into WIL experiences. First, researchers have found that employers perceive value in WIL experiences and microcredentials (Gallagher, 2018). Likewise, WIL and microcredentials share the potential to expand learners' work-aligned skills and develop lifelong learners (Billet & Choy, 2011; Lewis & Lodge 2016; Grant 2014). In a 2018 survey, employers' highest recommended priorities for higher education was the inclusion of WIL and to provide academic credit for "experience and on-the-job learning" (Gallagher, 2018, p. 18). This suggests employers wish to see validation of the skills students gain during WIL experiences.

Despite the perceived benefit of incorporating microcredentials into WIL programs, we have yet to understand where their value lies. We suggest that Bourdieu's theory of capital, and specifically his account of cultural and human capital, may offer an explanation for the proliferation of alternative credentials (Bourdieu, 1984; Bourdieu 1986). Human capital refers to embodied competencies, skills, and experiences that produce economic value. Human capital theory proposes that the competencies developed through the completion of educational programs aid in students' ability to market

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themselves and their skills to potential employers (Walters, 2004). In the context of microcredentials, human capital theory argues that the alternative credential market allows individuals to gain human capital faster, and at a lower cost, than traditional education (Phelan & Glackin, 2020). Embodied cultural capital refers to familiarity with cultural knowledge, values, skills. Educational qualifications are a form of institutionalized cultural capital that symbolize this cultural competence. As traditional credentials become less exclusive, the proliferation of alternative credentials can be interpreted as attempts by learners to stand out, to market their exclusivity, and to demonstrate their possession of cultural capital relative to candidates with similar educational backgrounds. From this theoretical standpoint, students and employers should value microcredentials that demonstrate exclusivity, indicative of cultural capital, and desirable competencies, indicative of human capital. In this way, microcredentials may provide employers with further evidence of the degree to which students possess human and cultural capital as well as an additional avenue for students to distinguish themselves from other candidates.

In order to determine the extent of adoption of microcredentials, and where their value lies, this study was conducted in two phases. The first was a survey examining employer and student perceptions of microcredentials. The second was semi-structured interviews exploring students' perspectives on the process of earning a microcredential during their work term. Together, both phases of the study examined three research questions, which ask: 1) To what extent are students and employers aware of microcredentials? 2) To what extent do students and employers associate value with microcredentials? More specifically, Phase 1 of the research subsequently asks: Where do the values associated with microcredentials by employers and students either diverge or align? Further, does the type or function of the microcredential in question influence its perceived value? This research question explores the extent to which employers and students perceive microcredentials to be a source of cultural capital. 3) To what extent do microcredentials motivate students (e.g., in terms of grade received, content mastery) during their professional development (PD) course?

LITERATURE REVIEW

Employer Perspective

Research on the employer perspective of alternative credentials is limited and predominantly focused on employers' familiarity with and opinions of alternative credentials. When surveyed in 2018, employer awareness of microcredentials was found to be low but developing quickly (Gallagher, 2018). Nonetheless, employers' desire for more specific evidence of employees' skills is significant (Barton 2006; Raish & Rimland, 2016;). Similarly, 64% of hiring managers surveyed agree that "the need for continuous lifelong learning will demand higher levels of education and more credentials in the future" (Gallagher, 2018, p. 3). Employers perceive value in microcredentials through their ability to signal areas of "specialized knowledge" and also perceive work-integrated learning as an indicator of credential quality (Gallagher, 2018, p. 14), suggesting a potential for combining these learning experiences. Rosendale (2016) suggests that employer characteristics influence the value they assign to alternative credentials, with hiring managers in technical industries valuing acquisition of knowledge through Massive Open Online Courses (MOOCs), more than employers in other industries.

Evidence suggests that traditional academic credentials remain more valued by employers than alternative credentials. Rosendale (2016) found that employers valued academic courses more highly than MOOCs for fostering communication skills. Similarly, Gallagher found that employers perceive microcredentials as complementary additions to academic credentials, rather than as replacements of

traditional degrees (2018). These results suggest that alternative credentials do not currently pose a threat to higher education and implies that there remain questions about their credibility in comparison to traditional credentials.

In response to uncertainty around measuring the quality of alternative credentials, Gallagher found that the primary indicators of quality credentials to employers are “industry validation and alignment”, “experience with previous hires from a credential issuer and their performance results” and the brand and reputation of the issuer (2018, p. 17). Research simultaneously investigating employers’ and students’ perspectives of microcredentials would provide valuable opportunities for comparison.

Student Perspective

A study of undergraduate students in the United Kingdom found that students felt a need to earn credentials beyond their academic environment as a means of marketing their “graduateness, or potential as graduates” (Tomlinson, 2008, p. 57). Driven by employers’ expanding interest in employees’ specific skills and attributes, students were mainly interested in credentials representing soft skills but were unsure how to market these skills and their value as graduates to potential employers in order to distinguish themselves from candidates with similar levels of education (Tomlinson, 2008). This research suggests that students may perceive alternative credentials as valuable for marketing themselves as more employable than other graduates.

Previous research evaluates the implementation of microcredentials, and in particular, the introduction of digital badges in academic courses. Findings regarding student motivation are mixed, with some studies reporting that microcredentials motivated learning and others reporting little effect on motivation (Elkordy, 2016; Haaranen et. al, 2014). Additional research suggests that student motivation to pursue microcredentials is reduced when they are awarded solely based on participation and when students’ grades are dependent on earning microcredentials (Abramovich et al., 2013; McDaniel et. al, 2012). This implies that the completion criteria of the microcredential plays an important role in student motivation. Similarly, student’s perceived value of microcredentials appears to be contingent on employer recognition (Glover, 2016), which may account for students’ mixed positive and negative reactions to badges (Haaranen et al, 2014). This points to the importance of collecting data from both students and employers to understand perceptions of microcredentials. Research on additional moderators of student perceptions of microcredentials would provide greater insight on how to successfully implement alternative credentials.

METHOD

To inform the development of a microcredentials project for WIL students, understanding employer and student perceptions of microcredentials was vital. In order to do so, this research employed two methods of data collection, surveys and interviews, to gather data in two consecutive phases. First, employer and student surveys were curated. Institutional ethics approval (no. 41997) was obtained after this program development data was collected to disseminate these findings in the WIL research community. A survey was distributed to employers visiting campus to interview co-operative education (co-op) students and an online survey, created using Qualtrics software, was issued through professional development courses for WIL students. Both employers and students were entered into a draw for a \$100 gift card.

A succinct description of microcredentials was provided at the beginning of the surveys as a reference for participants. A total of 17 items were included on the employer survey and a total of 18 items were

included on the student survey. Participants rated their agreement with items on a five-point Likert scale from 1=strongly disagree to 5=strongly agree. The student survey collected student's faculty, type of WIL program, and academic program as demographic data. Three researchers developed the survey to test for comprehension. Overall, the employer survey had strong reliability ($\alpha=0.91$), as did the student survey ($\alpha=0.90$), indicating high internal consistency (Litwin, 1995).

The surveys were devised to reflect themes of awareness, perceived value, and motivation identified in the literature (Ahn et al., 2014). The employer and student surveys were designed similarly to enable comparison of perspectives, with slight adaptations for each participant group. Items designed to elicit perceptions of value include "Microcredentials are a good signal to potential employers about the skills a candidate possesses". To further explore employers' and students' perceptions of value, items investigated whether factors, such as the granting body of the credential and the completion criteria of a credential, affected how highly participants' value microcredentials. To assess motivation, items on the student surveys measured whether students would be willing to exert more effort to earn a microcredential (e.g. "I would exert more effort in my workplace if I could earn a microcredential").

A total of 1,016 student and 124 employer responses were included in analyses, after screening for blank and predominantly incomplete responses. The majority of students were enrolled in the Engineering faculty (38%) and in a co-operative education program (95%). The research team used SPSS to run the descriptive statistics, dependent and independent t-tests, and correlations. Independent t-tests were used to compare employer and student responses, which were followed by dependent t-tests to compare student and employer perceptions based on type and function of microcredential (e.g., technical versus soft skills). Correlations were conducted to determine whether the awareness of microcredentials was associated with perceptions of their value.

For the second phase of data collection, semi-structured interviews were conducted with engineering co-op students participating in communication (2 students) and problem-solving (5 students) PD courses. In this pilot project, students were eligible to earn the microcredential upon earning an 80% in their PD course and a 'Superior performance' rating from their employer for the specific skill assessed in their PD course (problem-solving or communication). After receiving institutional ethics approval (no. 42634), co-op students were recruited through email. Eligible participants were in their second or third year of academic study and enrolled in their fourth or fifth work term. Of the seven interviews that were conducted, six students were in the first half of their third year and one student was in the latter half of their second year. Further, two (of 7) students were enrolled in their fourth work term whereas the remaining five students were enrolled in their fifth work term. Interview participants were completing their work term in various industries, including: telecommunications, consulting, software, automotive, public service, and/or technology.

Interviews were conducted on Cisco Web-Ex and lasted approximately 20 minutes. Participants were remunerated with a \$10 gift-card for their participation. Open-ended questions were used to examine students' experience in the microcredentials project, including asking how the potential to earn a microcredential influenced their work term and PD course experience, and if students perceive value in earning microcredentials in WIL experiences.

To understand participant's experience, a grounded theory approach was utilized (Charmaz, 1996). First, transcripts were analyzed using line-by-line coding (Glaser & Strauss, 1967). Open coding was employed to generate as many codes (or potential themes) as possible in the initial stage. Then recurring codes were used to identify themes in participant's responses until no new themes were

identified. Next, those codes were aggregated into main themes, based upon the most prevalent codes in the transcripts and themes relevant to the research questions. For the purposes of this paper, this generated three main themes for analysis: awareness, value, and motivation associated with microcredentials.

RESULTS

Level of Familiarity

Survey responses from Phase 1 indicated that familiarity of microcredentials did not differ between groups ($t(1138) = 0.19, p = 0.85$), but that overall levels of familiarity among students ($M = 2.46, SD = 1.26$) and employers ($M = 2.48, SD = 1.39$) were low. These findings suggest that there is substantial opportunity to inform WIL stakeholders about microcredentials to improve awareness of and familiarity with them in future.

The interviews conducted with students in Phase 2 indicated similar results. Five of the seven students (P1, P2, P5, P6, and P7) indicated they had no or very little awareness of microcredentials prior to the work term they were completing at the time of the interview. Two students (P4 and P7) indicated that they were aware microcredentials courses often provided a certificate upon completion to advertise to employers, but P3 mentioned they were not interested in them prior to the work term they were completing.

Perceived Value

The second research question explored students' and employers' perceptions of value. Mean responses to survey items from Phase 1 are summarized in Table 1 below, indicating moderate to high perceptions of value for employers and students. However, the perceived value of microcredentials does differ across students versus employers in some instances. Employers agreed less strongly than students that microcredentials are valuable for demonstrating competence in a technical skill ($t(1131) = -2.43, p < .05$) or a soft skill ($t(1129) = -3.40, p < .001$). On the other hand, employers agreed more strongly than students that the value of a microcredential: is dependent on what needs to be done to earn it ($t(1134) = 2.42, p < .05$), is based on knowledge acquisition and demonstrating competence in a particular skill within a work environment ($t(1134) = 2.00, p < .05$), and that it is dependent on the credibility of the organization that grants it ($t(1134) = 2.72, p < .01$).

Though the survey indicated that students more strongly agree that microcredentials are valuable for demonstrating competence in a technical skill than a soft skill, some interviews emphasized the opposite. P4 mentioned that PD courses weren't known for covering technical skills. P5 indicated that they felt that the courses in their degree itself covered more of the technical skills required or sought after for employment. As such they were unsure whether "a technical microcredential would be worth much in the context of a course." Instead, P5 spoke to the value of microcredentials covering "soft skills that are harder to communicate."

TABLE 1: Mean rankings for perceived value items

Item	Students		Employers		t	df
	M (1 to 5)	Standard Deviation	M (1 to 5)	Standard Deviation		
Microcredentials are a good signal to potential employers about the skills a candidate possesses	3.59	0.90	3.43	0.97	-1.86	1127
Microcredentials are valuable for demonstrating competence in a technical skills	3.60	0.94	3.38	0.99	-2.43*	1131
Microcredentials are valuable for demonstrating competence in a soft skill (e.g., communication, teamwork)	3.08	1.12	2.72	1.08	-3.40***	1129
Microcredentials are a good way for employees to be recognized for skills they have developed	3.68	0.96	3.51	0.88	-1.87	1130
Microcredentials are a good substitute to a degree or diploma as a signal for employability	2.41	1.07	2.29	1.07	-1.13	1132
Microcredentials are a good complement to a degree or diploma to indicate the specific skills a candidate possesses	3.87	1.00	3.79	0.95	-0.77	1123
The value of a microcredential is dependent on what needs to be done to earn it	3.87	0.97	4.10	1.00	2.42*	1134
A microcredential is valuable if it is based on successfully completing a course (knowledge acquisition)	3.41	0.95	3.38	0.98	-0.38	1136
A microcredential is valuable if it is based on demonstrating competence in a particular skill within a course or simulated environment	3.69	0.91	3.74	1.00	0.63	1134
A microcredential is valuable if it is based on demonstrating competence in a particular skill within a workplace environment	3.76	0.96	3.90	1.08	1.43	1136
A microcredential is valuable if it is based on both knowledge acquisition and demonstrating competence in a particular skill within a workplace environment	3.98	0.96	4.16	0.95	2.00*	1134
The value of a microcredential is dependent on the credibility of the organization that grants it	3.87	1.01	4.14	1.09	2.72**	1134

Note. M = Mean ranking on a scale from 1 = Strongly Disagree to 5 = Strongly Agree. * = $p < .05$; ** = $p < .01$; *** = $p < .001$.

P1, P2, and P5 indicated examples for microcredentials covering soft skills such as: communication, teamwork, problem solving, leadership, and project management. However, P3 indicated that covering technical skills with microcredentials is "harder to do, but it'd be nice." P7 agreed with this sentiment, seeking a technical microcredential for skills that aligned with their courses, such as JavaScript.

Interviews also indicated that students associated the perceived value of microcredentials with the competency they signal, and the legitimacy associated with their exclusivity. P1 discussed that obtaining a microcredential was able to “prove” or verify a student had the associated competency, as they had already “met the bar” required to gain entry to and to complete it. P4 indicated something similar, comparing the microcredentials ability to signal competence to the performance evaluations conducted by their employer during their work term.

In relation to exclusivity, P1 continued by stating that “it’s good to do the learning, but it’s also nice to have something to show for it,” and emphasized the importance of “distinguishing yourself from other people graduating.” P3 also commented on the importance of exclusivity, “otherwise everyone can get it [the microcredential],” which assumedly negates at least some of its value. P5 similarly discussed the importance of exclusivity, stating that “having a number of them [microcredentials] kind of defeats the point.” P1 felt that the microcredential itself would signal value, bypassing the need for them to demonstrate the associated competency during the hiring process. In comparison, although P3 and P4 agreed upon the general value of microcredentials, they felt that their value is associated with the learning and competence that is fostered during them, rather than from the credential itself.

Motivation

In response to the third research question examining student motivation, Table 2 suggests that students may be motivated to exert additional effort to earn a microcredential. In particular, it appears that an institutional affiliation associated with the microcredential and incentivizing mandatory professional development courses provide the greatest motivation to students to complete a microcredential. Almost two-thirds of students agree or strongly agree that a microcredential issued by the University of Waterloo would be a valuable signal of skills to employers ($M=3.84$, $SD=1$). Just over two-thirds of students agree or strongly agree that they would exert more effort in their professional development courses if they were incentivized with a microcredential upon completion ($M=3.78$, $SD=1.18$).

TABLE 2: Mean rankings for motivation items

Item	M (1 to 5)	Standard Deviation	Agree or Strongly Agree (%)
A microcredential issued by the University of Waterloo would be valuable signal of skills to employers.	3.84	1.00	65.9
A microcredential issued by an online educational platform would be a valuable signal of skills to employers (e.g., LinkedIn Learning)	3.37	1.06	49.5
A post-graduate candidate who has microcredentials on their application is more likely to get an interview	3.42	0.96	47.3
I would exert more effort in my PD course if I could earn a microcredential	3.78	1.18	66.7
I would exert more effort in my workplace if I could earn a microcredential	3.66	1.12	49.0

Note. M = Mean ranking on a scale from 1 = Strongly Disagree to 5 = Strongly Agree. PD course refers to the online professional development courses students take during their WIL experiences

The interview data supports the findings from Phase 1, as 3 students (P1, P5, and P6) all indicated the additional effort they put into their PD course to obtain the microcredential. In particular, P6 mentioned that they “would usually look at what the passing rate is” to inform the goal they set for themselves in the course since their PD course has traditionally been evaluated as pass or fail. They mentioned that in previous PD courses they would “skip the content and try to answer the assignments” based on their existing knowledge. However, in the case of their PD course with an associated microcredential, their goal was “to get an 80%” to achieve the microcredential, and so they read the content for the assignments in its entirety prior to submission to achieve that goal.

DISCUSSION

The increase in offerings of alternative credentials indicates changes in the credentialing landscape. To answer the first research question, general awareness of microcredentials remains low, as it has in past research (Gallagher, 2018). Survey responses from Phase 1 indicated that familiarity of microcredentials did not differ between groups, but that overall levels of familiarity among students and employers were low.

The interviews conducted with students in Phase 2 indicated similar results. Five of the seven students (P1, P2, P5, P6, and P7) indicated they had no or very little awareness of microcredentials prior to the work term they were completing at the time of the interview. Two students (P4 and P7) indicated that they were aware microcredentials courses often provided a certificate upon completion to advertise to employers, but P3 mentioned they were not interested in them prior to the work term they were completing.

In response to research question two, students and employers assigned moderate to high value to microcredentials as signals of an employees’ competency. This finding is consistent with Gallagher’s (2018) assertion of the perceived value of microcredentials by employers. The value associated with microcredentials was due in part to both to the legitimacy of the exclusivity associated with them, and the criteria required to earn the microcredential. Stricter criteria for obtainment appeared to be associated with greater value of the microcredential. As microcredentials appear to be appreciated for their exclusivity, this finding suggests they are valued as a source of cultural capital.

In agreement with previous research (Rosendale, 2016; Gallagher, 2018), employers’ value microcredentials more as complements to degrees, than as substitutes. It appears that employers may be more skeptical than students are that microcredentials provide evidence of skill acquisition. Employers also appear more discerning than students about what is required to earn a microcredentials and the institution offering the microcredential. These results suggest that employers may need to be given more information about the value and use of microcredentials in order to trust and increase the perceived value in them.

The survey indicated that both employers and students’ value microcredentials that demonstrate technical skills more than those demonstrating soft skills, which may result from the belief that soft skills are difficult to assess (Gibb, 2014). However, aligning with Tomlinson’s (2008) assertion of the interest in soft skills, the opposite was true with interview data. Students more often associated a valuable and feasible microcredential as one that developed students’ soft skills. The issuing body of the microcredential also appeared to influence its value, as students and employers attributed more value to a microcredential associated with the university than they did those obtained through an online education platform. Again, this suggests that students and employers value microcredentials

high in exclusivity and attractiveness, and therefore highly value microcredentials indicative of cultural capital.

Aligning with human capital theory, microcredentials are most valuable to students and employers when they demonstrate both knowledge acquisition and competency. This is consistent with previous literature pointing to the importance of validating alternative credentials through pedagogical quality (Abramovich et. al, 2013; Gibson et al., 2016). Surprisingly, employers diverge from students by valuing microcredentials demonstrating competence in a course and those demonstrating competence in the workplace similarly. One possible explanation for this discrepancy could be that WIL students, with greater proximity to the requirements for demonstrating competence in a course and in a workplace, are better positioned to distinguish between the two.

To answer the third research question, in line with Elkordy's (2016) results, microcredentials were found to positively influence students' motivation. The survey and interview data indicated that students were often willing to exert more effort in their PD course if they were awarded a microcredential. One student talked about how it may or may not impact ability to perform during their work term. Another mentioned that it encouraged their comprehension of the material as they thoroughly read through all of the content rather than skipping through elements they thought they may already know.

LIMITATIONS

Though this study made a valuable contribution to the literature, it is not without limitations. The study was conducted at one academic institution, though employer respondents represented a wide range of industries and organizational size. Most respondents lacked familiarity with microcredentials, suggesting employers and students were indicating perceptions of value with limited knowledge. Perceptions of value may fluctuate for samples with firsthand experience with alternative credentials. This finding informed the second phase of our research, where we collected data from students participating in a microcredential project. However, the response rate from students willing to participate in the interviews was quite low, and as a result, the number of participant perspectives included in the analysis is low. As awareness of alternative credentials increases, future research should also involve reassessing employers' perspectives.

CONCLUSION

The findings from these studies provide valuable insights for higher education stakeholders and WIL practitioners in response to the rise of alternative credentials. WIL programs provide the opportunity to collect valuable evidence of student competencies and these initial findings show promise for microcredentials as a means to certify their competencies and assist students in making the transition to work. As microcredentials increase in prevalence, it will be important for WIL educators to understand how WIL-based microcredentials fit into the larger landscape of microcredentials and to understand the perspectives of both students and employers with regards to the value they associate with microcredentials.

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