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Digital badges: Pinning down employer challenges

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Abstract

Digital badges hold considerable potential for employers and recruiters, as they evidence accomplishments of skills and competencies at a more granular level than a traditional degree certificate. Badges are a validated, online graphical representation of an achievement, which is accomplished by undertaking criteria-based learning activities. Despite the established educational benefits of badges in higher education, limited research has been conducted into employer awareness, acceptance, and use of digital badges in recruitment practices. To address this research gap, a mixed method study combining quantitative and qualitative data collection was conducted before and during the COVID-19 health pandemic. Approximately 700 employers were emailed and invited to complete the initial survey and 73 responded. One of the major survey findings is that 97% of respondents were unfamiliar with the concept of digital badges. Significantly, however, despite the lack of employer awareness there was no widespread resistance to the concept of badges, but a strong appeal for further clarification of their value, credibility, and security. Analysis of the data reveals stronger partnership working, between the higher education sector and employers, is pivotal to establish effective digital credentialing systems. Recommendations for higher education institutions have emerged from this study, which aim to balance pedagogical digital badge practice with employer needs. Such synergies are crucial to address the changing skills agenda, to prepare students to thrive in physical and virtual work environments. Given the paucity of research in this field, further studies are warranted, to investigate the impact of digital badges on the employer community.

Keywords: digital badges, digital credentialing, employability, online learning, skills development, graduate recruitment, employment, micro-credentials

Introduction and context

What are digital badges?

A digital badge (also referred to as an open badge or digital credential) is an online accreditation of an achievement, skill or quality, which has been accomplished by an individual who undertakes criteria-based learning activities (Dyjur & Lindstrom, 2017; Gibson et al., 2015). The online badge is a visual representation and validation of the accomplishment. Embedded metadata, within the badge image, includes the context, meaning, process and result of the learning activity (Gibson et al., 2015; Fields, 2015; Risquez, Cassidy, & O'Suilleabhain, 2020). Badges can be shared and displayed via

LinkedIn, and other social media outlets, online CVs, email signatures, personal blogs and ePortfolios, to present a digital record of an individual's skills, knowledge, and achievements (Janzow, 2014). Digital badges may be used to signify the achievement of smaller units of learning and skills acquisition, so called 'micro-credentials'. In this paper, it is important to emphasise that digital badges are not synonymous with micro-credentials, although the terms are sometimes used interchangeably in the educational literature (Rimland & Raish, 2019; Fanfarelli & McDaniel, 2019).

Digital badges and their educational benefits

In higher education, digital badges afford an opportunity to scaffold students' learning in both formal academic curricular modules and informal co-curricular learning environments, such as skills awards, volunteering, and student representation activities (Glover, 2013; Coleman, 2018). Awarding badges offers students tangible evidence of their valuable learning accomplishments. The badges can also be shared with others to showcase skills and achievements (Gibson et al., 2015). The real bonus of digital badges, however, is their flexibility, being contextualised within an increasingly digital environment, whether that be for campus-based, hybrid, or online learning; informal or formal education; modular, life-long, or life-wide. A digital badge approach, therefore, offers the potential to capture a more holistic, detailed reflection of a student's learning experience and educational achievements (Elliot, Clayton, & Iwata, 2014). Integrative learning across the curriculum and the co-curriculum, enables leverage of a persuasive strategy for students to develop their digital identity (Kehoe & Goudzwaard, 2015).

The educational literature reveals that universities are starting to appraise the purpose and value of badges, and badging systems, in higher education, mainly from a student learning perspective (Carey & Stefaniak, 2018). Examples of published pedagogical practice include a research study by Abramovich, Schunn, & Higashi (2013), which revealed that subjective evaluation of badges by students can be a key driver in their willingness to learn and their motivation to earn digital credentials. In the digital world, badges also provide visible identifiers for skills and attributes (Roy & Clark, 2019) and are a useful tool to reward and recognise students' skills development (Mathur, Wood, & Cano, 2018). Digital credentials, which can be easily shared, enable students to communicate a mastery of skills. These skills include critical thinking, digital literacy, leadership and teamworking, which complement the traditional, paper degree certificate or transcript, where specific skills and attributes are not always obvious. Students often overlook their competencies, so providing badges can be a useful aide-memoire to help them to track and to evidence their skills and graduate attributes (Miller, De St Jorre, West, & Johnson, 2017). Possessing this enhanced skills self-awareness augments students' employability, as they transition through their degree programme and beyond university; enabling students to showcase their soft skills proficiency to potential employers (Loughlin et al., 2016). Glover (2016) offers insights into how digital badges have the potential to acknowledge students' wider co-curricular learning, through encouraging their participation in informal learning activities. These additional achievements offer an important opportunity for students to reflect on their broader university learning and professional development. When used with points and a leader board, Gibson et al., (2015) report how digital badges can encourage student competition and engagement, and become a gamification element within teaching and learning. Other studies have evaluated the impact of academic skills badges on student retention and student adjustment to university-level study (Mah, 2016; Mah & Ifenthaler, 2019).

Digital badge use in academic contexts

During the last decade, much of the research across the globe, on the use of digital badging in higher education, has focused on the pedagogical role and value of badges. Studies have focused on different academic contexts, to recognise and reward student learning. Examples of badging practice, across academic subject areas, include the use of digital badges in a novel assessment

approach at Purdue University, USA. In their Chemistry degree programmes, badges are used to recognise and improve students' laboratory skills and practical confidence (Hensiek et al., 2017). To earn the badges, students create videos of their practical chemistry techniques and share them with an assessor for feedback (Hensiek, et al., 2016).

At Abertay University, Scotland, students studying Law can achieve the Abertay Division of Law Badge for successfully completing reflective tasks in a suite of five thematic workbooks. These learning activities facilitate student reflection on their professional competencies, which align with Abertay Graduate Attributes themes, namely: resilience, social responsibility, active citizenship, leadership, and communication (Anderson et al., 2017).

In contrast, Deakin University, Australia, has implemented its own innovative approach: 'Deakin Hallmarks'. The 'Hallmarks' were developed and endorsed in partnership with employers, to ensure that they denote outstanding achievement, as valued and judged through professional life and workplace standards (Oliver, 2016). 'Hallmarks' function as recognition and reward of outstanding employability-related learning outcomes during a student's degree programme (de St Jorre, Johnson, & Oliver, 2016). Students submit evidence of their achievement of 'Hallmark' criteria and standards, including leadership or digital innovation skills, to be assessed by senior academics and employer representatives. Successful student submissions are awarded a Deakin-branded digital badge, or credential, with embedded metadata of their achievement.

Challenges and considerations for employers

Digital badges hold considerable potential for use with graduate employers and postgraduate recruiters, as they showcase students' skills and achievements at a granular level to organisations outside the awarding university (Devedžić & Jovanović, 2015). To keep pace with the growing interest and implementation of digital badges in higher education, further empirical research is needed to understand wider stakeholder perceptions of badges, especially their practical use in the employer community. In 2020, Hill et al. undertook a pilot badge study, the results of which suggest that undergraduates were often unlikely to be readily mindful of their skills development, unless prompted. The research also highlighted the need for students to understand the purpose and potential use of badges beyond university life. This aspect is particularly critical to maximise students' career-readiness and employability. Stefaniak & Carey, (2019) have devised a useful higher education framework which covers three distinct categories: badge instructional design; badge system platform and badge programme implementation. Key aspects proposed by Stefaniak & Carey include the significance of explaining the purpose and value of badges to students and other stakeholders. In addition, their framework is designed to help students to appreciate the embedded badge metadata, to ensure they fully understand the employability value and benefit of digital badges beyond university. According to Hill et al. (2020) and other studies (Glover, 2016), undergraduate students often have a limited knowledge, of how the metadata embedded in badges can provide employers with an understanding of an applicant's skills, knowledge, and achievements. By extension, students and graduates may have only a limited perception of how the badge metadata might be used by employers, as part of recruitment short-listing and selection processes. The Stefaniak & Carey framework and research study calls for employers and businesses to recognise and value digital badges, acknowledging that there is often limited industry and business awareness of these digital credentials. Soliciting internal and external stakeholder involvement during the implementation and roll out of a new badging system is, therefore, crucial to maximise digital badge understanding, acceptance, and willingness to espouse.

Digital badges and employers: An underexplored area

A review of the literature reveals that only two preliminary studies have been conducted, which investigate employer perceptions and their use of digital badges in certifying student skills. The

employer study conducted by Raish and Rimland, (2016) had a specific focus on information literacy skills, which provided initial insights into the value of digital badges outside academia. In contrast, another study in 2018, focused exclusively on Human Resource Leaders in the USA (Gallagher, 2018). This research explored a broader range of themes, including skills-based hiring approaches, online education qualifications and awareness of digital badges in hiring candidates. In Gallagher's study, HR Leaders' awareness of digital badges on a candidate's CV were analysed and their awareness in this study was noted as low. In terms of further badge research, it would be useful to broaden Gallagher's Human Resource Leaders practitioner study beyond HR recruiters, as smaller businesses do not always have bespoke HR personnel or HR departments. This approach would enable a more representative understanding of the role of digital badges in recruitment and selection practices. Given the growth and interest in digital badges in recent years by higher education institutions, it is imperative that we start to better understand employer perspectives and acceptance of digital credentials. This understanding is especially pressing, as university qualifications and educational credentials play a central role in graduate recruitment, institutional esteem, and student employability.

In 2017, a study of digital badges and employers was undertaken at the University of Aberdeen, Scotland. The research used an online survey to investigate employer awareness, perceptions, and potential use of digital badges, across a range of employment areas and organisational sizes. To address the shortcomings identified in the preliminary, employer-focused digital badges surveys (Raish & Rimland, 2016; Gallagher, 2018), our study uses a broader range of organisational sizes, not solely HR recruiters, but employers involved in recruitment. It also explores a wider range of skills beyond the information literacy skills investigated in the research undertaken by Raish and Rimland in 2016. As a follow-up, prompted by the 2020 global COVID-19 health pandemic, a further short, sister survey was launched, in June 2020. This survey gathered a snapshot of any changes in mindset regarding digital skills and skills acquisition, resulting from the altered working practices of lockdown. This sister survey investigated remote working, students' digital credentials, and their preparedness for online working. Both surveys were tailored to gather and analyse employer viewpoints, to support the launch and realisation of a potential pilot, institutional digital badging system.

Methodology

An online digital badge SNAP Survey was launched, to gather feedback from employers and organisations representing a variety of employment sectors and organisational sizes. The mixed method survey explored the following themes via specific free-text and closed-ended questions: organisational typology; digital badges and student competencies; digital badges, student employability and recruitment. The survey introduction also defined the term 'open digital badge' to avoid any respondent confusion during survey completion. An internal list of careers and employability contacts was used to invite circa 700 organisations via email to this voluntary study. The contacts were locally, nationally, and globally based employers. All organisations approached were sent information outlining the nature of the digital badge study, and the ethical aspects associated with the survey-based research.

The quantitative survey data was analysed with SNAP software, and the qualitative survey data was analysed thematically to categorise responses into specific categories. The survey was anonymous, and any data collected was treated confidentially, in accordance with the UK Data Protection Act 2018. Data was collected for scholarly purposes only and was stored using a secure data platform. Ethical approval was also secured for this collaborative, Quality Assurance Agency (Scotland) commissioned project. Before the survey was launched, a pilot version of the 12 question, digital badge survey was released to four colleagues, to help avoid problematic and biased survey questions. All research conducted followed the quantitative and qualitative survey guidance and

practice outlined in the Higher Education Academy (HEA) publication, 'Getting Started in Pedagogical Research in the STEM Disciplines' (Grove & Overton, 2014).

A further follow-up survey, in June 2020, was also conducted with a smaller sample of eight respondents, who gave consent to be purposefully sampled following the initial, online SNAP survey. This short, five question free-text survey aimed to explore employer views on digital badges, in the time of rapid digitisation and remote working necessitated by the COVID-19 pandemic lockdown. The questions sought to illuminate a sample of employers' viewpoints for: the use of digital credentials in recruitment practices post-pandemic, the role of digital literacy skills in a more automated workplace, and the use of badges post COVID-19 for students to evidence their skill-sets.

To ensure a breadth of employment areas were investigated, HR Recruiters (or equivalent individuals) representing the job sectors, as categorised by Prospects (www.prospects.ac.uk/sectors), were approached to complete the initial online survey. 73 organisations responded to the survey. The distribution of employer respondents by employment sector comprise: Accountancy, Banking and Finance 7%; Business, Consulting and Management 6%; Charity and Voluntary Work 9%; Creative Arts and Design 1%; Energy and Utilities 14%; Engineering and Manufacturing 18%; Environment and Agriculture 4%; Healthcare 1%; Hospitality 3%; Information Technology 4%; Law 15%; Law Enforcement and Security 1%; Leisure, Sport and Tourism 3%; Public Services and Administration 4%; Retail 1%; Sales 1%; Science and Pharmaceuticals 4%; Teaching and Education 3%; Transport and Logistics 1%.

The distribution of employer respondents by organisational size is shown in Table 1. For this study, the size of each organisation has been categorised using the grouping presented in the House of Commons Small Business Enterprise and Employment Bill, 2014, namely:

- Micro business: a business with 1-9 employees
- Small business: a business with 10-49 employees
- Medium-sized business: a business with 50-249 employees
- Large business: a business with 250-1000 employees
- Super corporate: a business with over 1000 employees

Table 1: Distribution of Employer Respondents by Organisational Size

Type of Organisation	**% of Respondents**
Micro-business	8%
Small business	25%
Medium-sized business	23%
Large business	10%
Super corporate	34%

Results

Organisational typology

A selection of comments and views is provided from the research data, to illustrate the emerging themes from the qualitative survey data, which was collected before and during the COVID-19 global health pandemic in 2020. While quantitative survey data gathered is presented graphically.

The 73 survey respondents represented a wide range of employment areas and organisational sizes completed the digital badge survey, conducted in 2017. Respondents who completed the survey were from a diverse range of employment sectors, representing 19 of the 24 areas of the economy, as categorised by the Prospects job sector classification system (www.prospects.ac.uk/sectors). Crucially, it is important to note, that all survey respondents were involved in the recruitment of students and graduates in their organisations.

Figure 1 presents respondents' prior awareness of the concept of digital badges before the survey. It is clearly noticeable from the survey results, that most organisations had no knowledge of, and experience with, digital badges. Given 97% of respondents noted that they were unfamiliar with the concept of digital badges. The only two organisations familiar with badges, in our survey, were a super corporate science and pharmaceutical organisation and a small charity. The employment areas as classified by Prospects, and not captured in our survey responses are: Marketing & PR; Media; Social Care; Property and Construction.

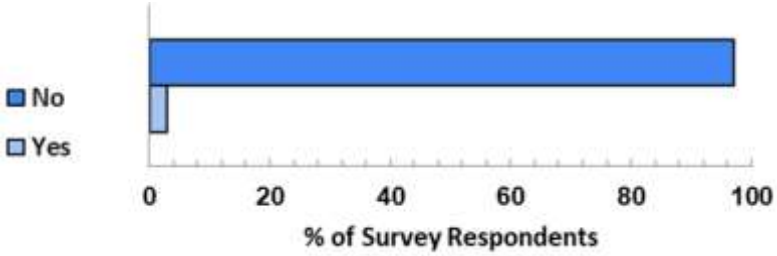

Figure 1: Organisational Awareness of Open Digital Badges Prior to the Survey

Organisational awareness of digital badges was explored further through an open-ended survey question, which provided respondents with the chance to add further insight and context to the data presented in Figure 1. This approach also enabled respondents to express their interest and curiosity, in finding out more about badges, as visual indicators of skills and achievements. The majority who responded 'No' in Figure 1 felt they needed more detailed information, as illustrated through a raft of similar comments, such as:

> *Potentially if given more information* (Information Technology, Small Business).
>
> *Don't know enough about badges but interested to find out more* (Energy and Utilities, Super Corporate).
>
> *Yes - would need further information before committing to anything* (Charity and Voluntary Work, Micro-business).
>
> *Will have to discuss with Human Resources to understand if it is something, they will like to engage in* (Engineering & Manufacturing, Medium-sized Business).

Digital badges and student competencies

Despite the surveyed organisations indicating their lack of digital badge knowledge and awareness, it was encouraging that businesses were keen to find out more. In the survey, respondents recognised the potential use of digital badges, as a mechanism for students and graduates to share their skills, accomplishments, and learning. Survey participants were also able to indicate through selecting their top five, in-demand skills and competencies, the qualities, which their organisation most value in their employees (Figure 2).

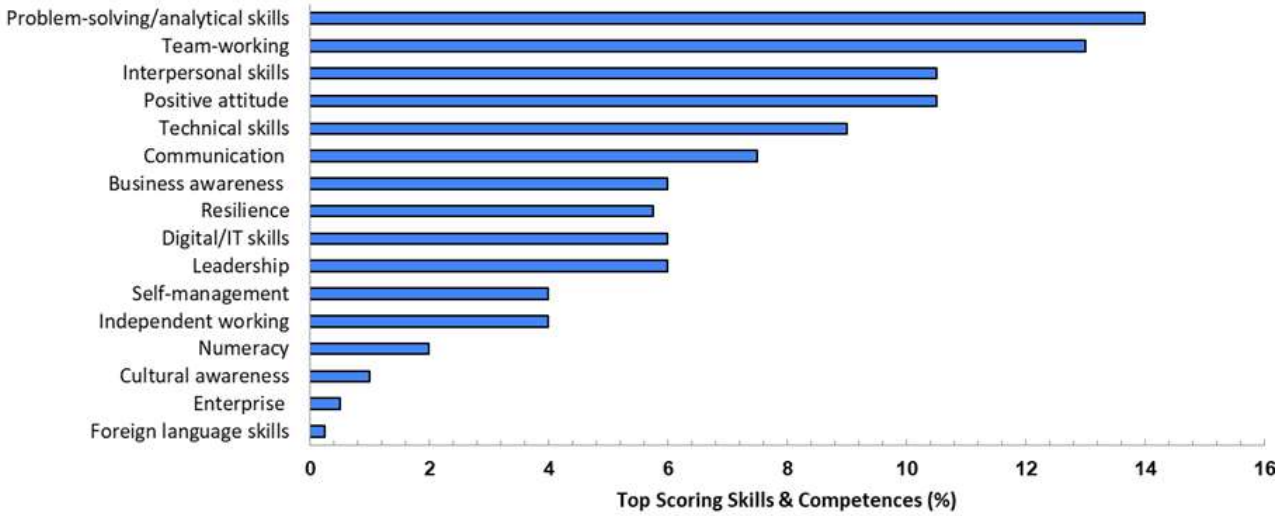

Figure 2: Skills and Competencies Most Valued by the Surveyed Organisations

The survey also explored employers' views on the level of skills-preparedness shown by new graduates in their organisation. Mixed views were gathered from the survey; respondents indicated that graduates lack specific skills and can sometimes be ill-prepared for the workplace.

> *Most require development in at least two of the competencies I listed* (Leisure Sports and Tourism, Small Business).
>
> *Written communication is often poor* (Engineering & Manufacturing, Small Business).
>
> *Many still need to work on their business awareness* (Law, Medium-sized Business).
>
> *Those with internship experience have adequate preparedness, those without are wholly unprepared* (Engineering & Manufacturing, Medium-sized Business).

There were positive comments, too, although it is evident from the wide range of explanations in this survey that employers are arguing the need for more prepared and work-ready graduates.

> *I believe that our most recent intake of graduates possess most of these skills to a very high level* (Energy and Utilities, Super Corporate).
>
> *They usually have the rudimentaries of these skills* (Law, Large business).
>
> *If they have no previous work experience then their skills are lacking* (Teaching and Education, Medium-sized business).

It was noteworthy that several respondents highlighted and shared their organisation's competency framework, and the skills and attributes already agreed for employees within their business.

> *Our core competencies are: Passion; Communication; Leadership; Team- work; Resilience; Receptive; Initiative* (Teaching and Education, Super Corporate).

Digital badges, student employability and employment

When employers and organisations were asked, specifically in the survey if they would be interested in using an applicant's digital badges in their selection and recruitment processes (Figure 3), 62% of our survey respondents expressed a positive interest, in using digital badges to validate student skills. Interest was noted across all employment areas, although a notable percentage, 29%, selected 'Maybe…'. Those responding 'Maybe…' expressed the need for more information before being able to answer, for example:

> *We would need to know more* (Charity and Voluntary Work, Micro-business).

We would need educated on the value and recognition of them in business/industry (Law, Large Business).

It is encouraging to note the strong acceptance and interest by the surveyed organisations, in the use of digital badges to supplement traditional recruitment practices (Figure 3). It is also positive that free text responses indicate that organisations are curious about digital badges and are keen to understand more about their purpose and their value in recruitment processes.

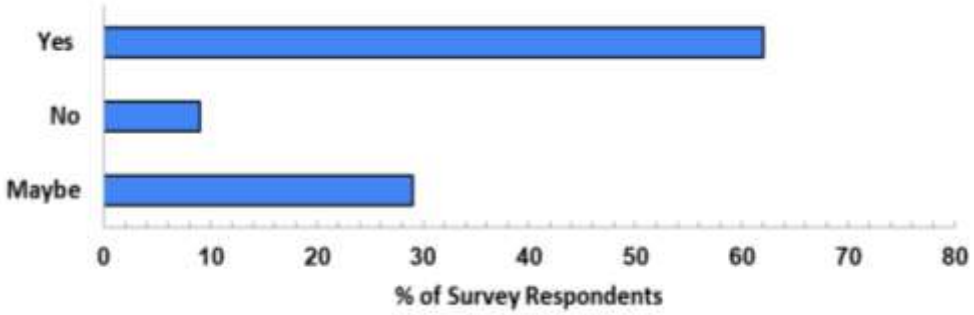

Figure 3: Employer Interest in Open Digital Badge Adoption for Recruitment and Selection Practices

In the survey, organisations were also asked to select the one most important factor for their business when recruiting graduates (Figure 4). 56% of respondents selected generic skills and competencies for the workplace. Interestingly, 32% of respondents also selected the degree subject studied, as important to employers in graduate recruitment.

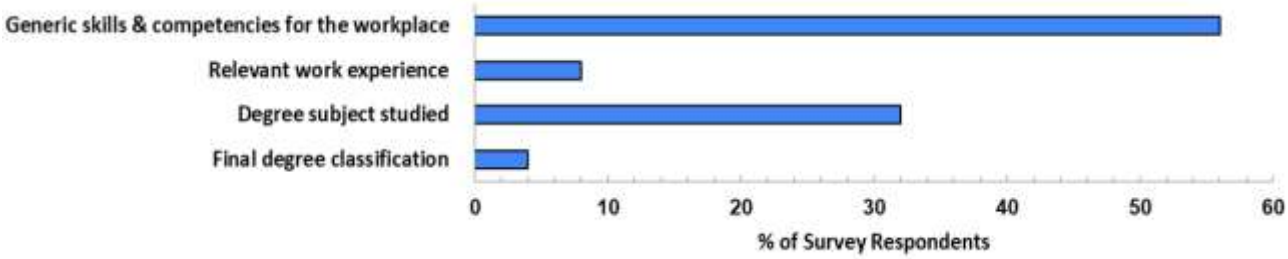

Figure 4: Factors Considered Most Important in Graduate Recruitment

In Figure 5, 57% of the organisations surveyed reported that digital badges would be a useful addition to more traditional forms of student certification, so called macro-credentials.

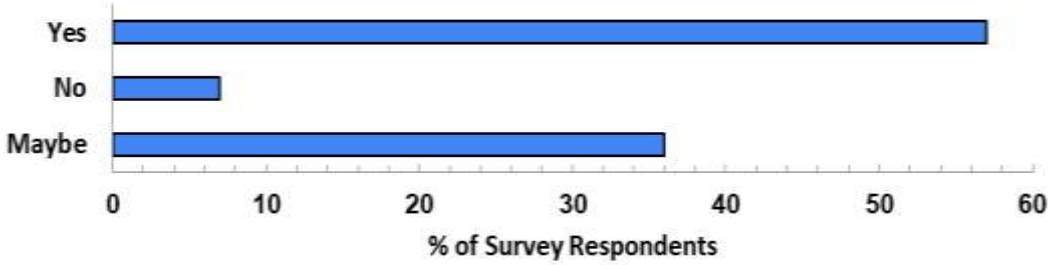

Figure 5: Employer Interest in the Use of Badges to Complement More Traditional Forms of Educational Certification

Those responding '*Maybe…*', felt they needed more information before being able to answer, for example: *Don't know enough about them to be able to answer this. Open to new ideas though!* Several emerging quality assurance themes occur in responses:

Potentially if strict criteria are in place for achieving them (Information Technology, Small Business).

If it could guarantee what other skills a graduate could bring to the workplace then yes (Energy & Utilities, Super Corporate).

Useful only if universally recognised/valued (Law, Large Business).

If they add to or expand on an academic record, then they may be useful (Accountancy, Banking and Finance, Medium-sized Business).

The comments indicate that organisations valued the granular and verifiable skills information. In addition, however, there are strong indications of the need to be reassured of the badge credibility, if they are to use it confidently to evaluate an individual's achievements.

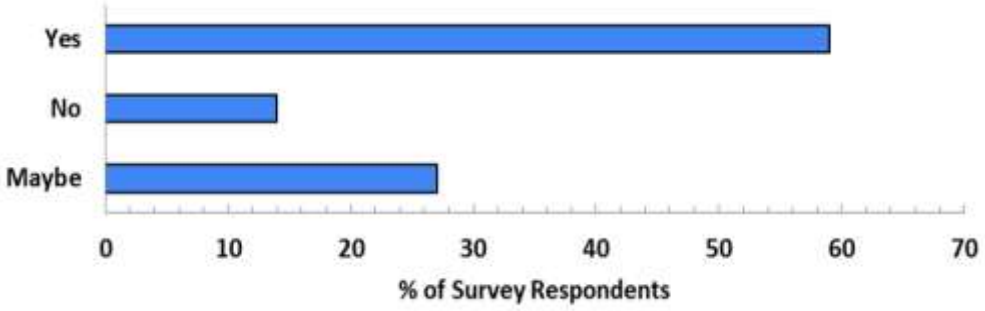

Figure 6: Employer Verification of Digital Credentials

When questioned: Would your organisation closely examine a candidate's 'digital badges' to verify the badge issuer, the activities carried out, the skills developed and the issue date, 59% of respondents indicated 'yes' (Figure 6). This is not surprising, as it is not uncommon for employers to vet potential employees. Free-text responses included:

Yes - some badge issuers might carry less credibility (Law, Small Business).

Would this competency check not be conducted by the university? (Charity and Voluntary Work, Small Business).

Again, more education needed (Law, Large Business).

Clearly, there are mixed views, and a lack of understanding and/or knowledge from some respondents, regarding the embedded metadata content in digital badges.

As part of the survey, organisations were also asked for their views on how universities could use 'digital badges' for supporting students' employability. A plethora of ideas and takeaway suggestions were shared, covering areas such as career development learning, badge standards, skills verification and alignment with the key competencies requested by employers, as illustrated via the following responses:

Encourage extra-curricular activities to build their skills base and learn about career aspirations (Retail, Super Corporate).

Encouraging students to achieve badges in areas that help make them more employable (Business, Consulting and Management, Micro-business).

Gaining industry recognition would allow badges to be used as a skills standard (Engineering and Manufacturing, Super Corporate).

Employers need to buy into the scheme to give credibility/validity and therefore encourage student uptake (Charity and Voluntary Work, Micro-business).

Students should be required to meet strict criteria to achieve them, otherwise they'll be worthless (Information Technology, Micro-business).

Make sure that the skills obtained are easily verifiable (Science and Pharmaceuticals, Super Corporate).

Digital badges can be displayed by students and graduates via digital CVs, social media platforms, such as the professional networking site LinkedIn, or other channels. Organisations were asked for their preferences on how students might showcase their badges to employers and recruiters (Figure 7).

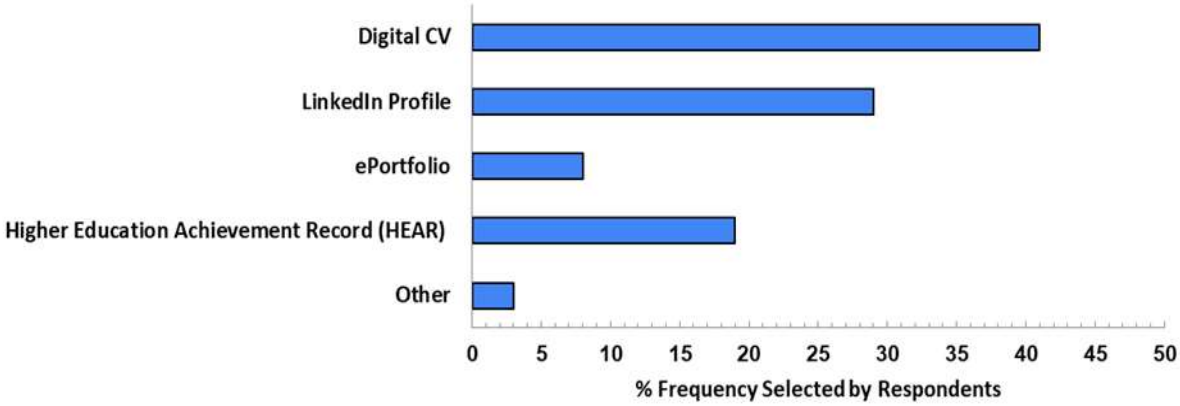

Figure 7: Employer Preferences for Reviewing Applicants' Digital Badges

Survey responses in Figure 7, indicate that organisations are willing to review awarded badges via a range of channels, with a digital CV and LinkedIn profile being most popular. Comments included via the 'other' category, include covering letter and several remarks from respondents about their uncertainty to answer this question.

Digital badges and remote models of working

In our short, follow-up purposeful sampling, qualitative survey in June 2020, which was circulated during the global COVID-19 health pandemic, respondents' comments suggested digital credentials are here to stay. Eight employers were asked for their views on digital credentials, digital literacy skills and the use of skills badges post COVID-19. Respondents remarked on digital badge use in identifying and nurturing future talent lines, as stressed in this quote:

I think this will become more relevant as we seek out new ways of getting to know individuals before recruitment (Education, Micro-business).

In addition to this use, a shift to more skills-based selection and digital recruitment processes was indicated:

If linked correctly with technology platforms it will allow graduate employers to use online tools including LinkedIn and Reed, to search with greater accuracy students/graduates who have demonstrated/ verified capability in specific skill sets (Retail, Super Corporate).

The significance of an effective student LinkedIn profile, online networking experience, and digital literacy skills were also stressed in a range of responses. All are key to help students transition to employment, as illustrated in this employer remark:

Get involved in discussions on professional social media. Follow companies you are keen to join- don't directly ask for a job but add meaningful comments or posts. Embrace all digital literacy training - seems intuitive and obvious when you're a student but those in the workplace often struggle to keep up (Energy and Utilities, Large Business).

In the evolving digital-driven employment landscape, workplace skills and competences can also shift and change. This follow-up survey revealed the sustained appeal of digital badges and their value in training, upskilling and personal development, as pointed out in this comment:

> *Challenging as it is, start with some self-assessment, ask yourself honestly, what are my strengths? Where are my current opportunities to improve? It is not a new model, but the aim is always to turn opportunities into strengths. My advice would then be to look to upskill in both theoretical and practical terms* (Retail, Super Corporate).

Discussion

With 97% of organisations in this study reporting their unfamiliarity with the concept of digital badges, the survey findings indicate that much more information and knowledge exchange, about the purpose and value of badges, is necessary to help increase awareness in the employer community. The findings of the 2017 and 2020 surveys give initial insights into employer perceptions, awareness, and acceptance of digital badges across a range of employment sectors and organisational sizes. Key indicators from the survey data imply that overall, employers and recruiters are not sufficiently appraised of the existence, or value of these supplementary digital credentials/badges, and remain to be persuaded of their worth as authenticators of skills development. Significantly, however, there was no widespread resistance to the concept of such in our research, but a strong appeal for further clarification of their value, credibility, and security.

Dyjur & Lindstrom (2017), in their preliminary findings, in *Perceptions and Use of Digital Badges for Professional Learning Development in Higher Education*, also indicate that individuals have mixed values about badges, do not always fully understand what digital badges are and how they might be used, thus underlining the need to engage actively with employers, to work in tandem and not increase misunderstandings. Roy and Clark (2018) also highlight, in their review, the lack of empirical evidence of badge understanding and relevance outside of the academic learning environment. Holistically, there needs to be much greater dialogue between universities, policy makers, employers, professional bodies, and the higher education sector. This approach would facilitate tackling impending skills needs and trends, to prepare individuals for the future workplace.

Interestingly, the skills most valued by employers in our survey align well with the most valued skills found in *The Global Skills Gap Report* (2018). This report identifies the three skills most valued by employers as: problem-solving, team-working and communication. Perhaps unexpectedly, the least valued skills in our employer survey were identified as numeracy, cultural awareness, enterprise, and language skills. Language skills are also not ranked highly in *The Global Skills Gap Report*. It is, however, surprising that enterprise is not especially valued in our survey responses, not least as it has been identified as a premium and core business skill for the ever-changing employment landscape (UKCES, 2014). *The Future of Jobs Report* published by the World Economic Forum (2020) provides a timely update for in-demand skills and skill groups across jobs in the next five years. Several of the competencies listed in this study, such as resilience and self-management, are predicted in the report to rise in importance, with the adoption of technology and emerging new job roles. In this current period of educational change and economic disruption, adopting some form of digital credentialing is key to support student employability and skills development.

The way that learning and skills development is being undertaken is also evolving in universities. To ensure student workplace readiness, the higher education sector is shifting its focus to new digital delivery modes and establishing a more lifelong learning culture (Maguire, Dale, & Pauli, 2020). Beyond the university environment, employers are keen to upskill and re-skill employees to keep pace with digitisation and technological innovation (Levine, 2018). Micro-credentials are helping to address the demands and changes of education and business: short courses such as MOOCs, credit, or non-credit bearing courses, focus on building capacity in an individual's knowledge and skills

(Oliver, 2019). Digital badges are the visual exemplification of this on-demand, micro-credential-based learning.

Digital badges afford the advantage for employers and recruiters of more detailed information than traditional degree certificates or academic transcripts, which typically present the subjects and grades achieved, or the overall degree classification (Carey & Stefaniak, 2018). It is clear from our study findings that with greater uptake, co-operation and standardisation by universities, digital skills badges offer considerable potential to help bridge perceived skills gaps between business requirements and graduate skills readiness for the workplace. Though there is still much to learn about employers' requirements and digital badges (Glover, 2013), it is encouraging to note from the survey that organisations are open to the media used to share badges. This willingness may encourage and help students and graduates to share their digital credentials more widely, beyond their awarding university, helping them to enhance their employability and preparedness for remote and traditional workplaces.

Working remotely has been widely adopted across the world, driven by the global COVID-19 health crisis in 2020, and is predicted to stay post-pandemic (Phillips, 2020). Linked to remote working is digital recruitment and the ability to share qualifications and digital credentials online, in both the application process and the short listing of candidates. Micro-credentials recognised by the award of digital badges, afford students the opportunity to showcase their skills achievements visually, in a more in-depth, granular format, to employers and postgraduate recruiters (Gibson et al., 2015). Equally, micro-credentials with an associated digital badge can enable recruiting organisations, to focus on skills-sets that align more closely with their business skills needs (Sutton, 2019). Such skills can be overlooked by traditional recruitment methods, which do not involve digital badges and the visual sharing of skills. The strong employer focus on the importance of generic skills and competencies in graduate recruitment is evidenced through our survey data. This focus is encouraging, as a wider range of organisations shift to a more competency-based recruitment approach to source individuals (Gauthier, 2020). Digital badges, unlike degree certificates, capture this information and, therefore, are of interest and value to recruiters (Bowen & Thomas, 2014).

The survey findings have helped to identify key recommendations that balance pedagogical digital badge practice in higher education with employer needs. Going forward, more work is needed by universities to help employers understand their value and how they are recognised and understood. Regarding the scope of current literature, evidence of meaningful interface of higher education with employers on awareness of, and engagement with, digital credentials as a reliable feature in recruitment processes, is limited (Gallagher, 2018). Until more research is in the public domain, questions remain to be answered: Are digital badges influencing employer recruitment and selection practices? Do badges have any bearing on recruiter interest in applicants? If higher education institutions are to encourage students and graduates to invest time in completing skills-based digital credentials, they need to be certain that the acquisition of digital badges truly supports students and graduates to secure employment. By extension, what plans are there for employers to use badges as part of their Continuing Professional Development (CPD) processes in upskilling and re-skilling of employees? This point is of especial note, given that the Future of Jobs Report (World Economic Forum, 2020), predicts employers are expecting to re-skill and upskill, approximately 70% of their employees by 2025.

To complement the engagement with employers, however, the higher education sector needs also to engage directly with students, to inform them of the value of micro-credentials and badges, how they work, with embedded data secured digitally, and how and where students can use them. Understanding the purpose of digital badges and how students can benefit from them is key to support learner engagement with digital credentials (Hickey et al., 2014; Hill et al., 2020). All stakeholders need to have confidence that the credibility and data security of digital badges is assured: that credential fraud is unlikely. However, to unlock the real potential of digital badges and their underpinning lifelong learning ethos, it is vital to have a flexible badge-awarding platform that

is not linked to a specific university, as this could prove too limiting over an individual's career trajectory. Exploring the feasibility of a secure, shared digital infrastructure badging service for use across multiple stakeholders to support lifelong learning is, therefore, worthy of investigation. Perhaps this is a tangible next step, to help develop productive employer and university digital badge partnerships.

Conclusion

Research on the role of digital credentials in teaching and learning is in its early stages, with much of the educational literature focusing on pedagogical approaches, integrative learning across academic and co-curricular domains and the use of badges to reward learning (Shields & Chugh, 2017; Kehoe & Goudzwaard 2015). This paper is distinctive and enriches this literature, as it concentrates on the underexplored areas of employer perceptions, awareness, and potential use of digital badges in recruitment practices. Interestingly and worthy of highlighting, is that despite the general lack of digital badge awareness by the employers surveyed in this research, respondents were generally receptive and inquisitive about digital credentials, once they understood their purpose. Other universities interested in badging systems are encouraged to take advantage of this appeal, in their wider, partnership working and their digital credential collaborations.

Analysis of the digital badge survey data in this study, reveals that a range of employer challenges need to be 'pinned down' and addressed by the higher education sector, to help further establish and launch digital badging systems. Based on this research, the following recommendations for higher education institutions have emerged:

- Engage with a broad range of HR recruiters, employers, professional bodies and employer organisations to gauge their acceptance and awareness of digital credentials.
- Enhance partnership working with employers to help inform and identify the badge skills and competencies to meet existing and future workplace needs.
- Establish a well-defined, accessible, and verifiable digital badge framework to underpin the badge awarding rationale.

The findings and challenges identified in this study, are likely to be of interest to a wide range of stakeholders, including academics, employability professionals and employers who are keen to capitalise on the potential of badges and to establish badging pilots.

Suggestions for further, more in-depth research in this area, include investigating whether digital badges are influencing recruitment practices, and reviewing if digital badges can really help students and graduates secure employment. While the evidence presented here indicates interest and acceptance by organisations and employers for digital credentials in the recruitment process. A limitation in this study is the size of the sample, further research and analysis of a larger sample size of employers from different employment sectors, organisational sizes and countries would provide further insights into this study's findings.

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