BEAUPEEP: Perceptions of digital badging for employability skills

A desk-based study

Amanda Smith
amanda.smith@open.ac.uk

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Introduction

Research into the use of digital badges (DBs) in higher education (HE) spans just over a decade. Although initially centred around the effectiveness of DBs in study management and student motivation, it was their use in supporting informal learning and as a 'virtual resume' (The Mozilla Foundation 2012) that garnered the most interest.

As an employability tool, the benefit is clear. Students collect DBs that provide a 'broader and deeper picture' of their competencies, extending beyond traditional qualifications (Gerstein 2013). Employers then 'draw on' these 'additional contexts' and 'specific skills' to differentiate between applicants (Glover and Latif 2013).

Nevertheless, despite employability taking on a 'central theme in HE' with the advent of the HEA Employability framework in 2015 (Knox and Stone 2019), DB integration in HE has been tentative, fostered by issues surrounding their value and credibility. As such, there appears to be a 'gap between what HE delivers and employer needs' (Ippoliti and Baeza 2017).

This study seeks to update the author's 2014 and 2020 studies (Digital Badges: An evaluation; Investigating the use of Open Badges in improving student engagement with module activities) by reviewing more recent evidence about the perceptions of digital badging for employability skills.

The study considers each of the three project research questions in turn, identifying relevant points, sources, and key takeaways.

RQ1. How are open digital badges awarded for student employability valued?

Student perspective

Published literature

There is very little published research related to the student perception of DBs as an employability tool, and what there is relates to DBs supporting 'extra-curricular' activities rather than embedded within formal, taught modules:

1. The potential of digital credentials to engage students with capabilities of importance to scholars and citizens (Miller et al. 2020)

This study focuses on student use of DBs in demonstrating 'broad, transferable, and essential' skills demanded by industry e.g., team working, critical thinking, problem solving. It centres around the use of *Deakin Hallmarks* – non-credit bearing university awards developed in collaboration with industry, providing students with a shareable record of their achievements in capabilities associated with their degree e.g., communication, digital literacy, teamwork, critical thinking, problem solving.

Methodology

- A case study of a *Deakin Hallmark* awarded to students enrolled in the Environmental Science degree for evidencing outstanding extra-curricular contributions to teamwork.
- A short anonymous survey at launch to investigate students' initial perceptions, intent to apply, concerns and questions. 34 (20% of those eligible) mainly second year students attended the information session and completed the survey.
- 2 of 3 students achieving the award participated in a semi-structured interview exploring student perceptions of its benefits and challenges.

Findings

38% said they intended to apply. There was only 1 application in the first year but 4 in the second.

Benefits:

- Evidence employability

- Open to everyone
- Differentiate themselves
- Share widely
- Self-reflection on capabilities and personal development
- Increased confidence in articulating skills
- Making a broader contribution

Challenges:

- Lack of time
- Insufficient and/or reliability of evidence to demonstrate achievement
- Value to employers

A few noteworthy points from the study are:

- The attractiveness of DBs to the less academic student, although the study suggests that students intrinsically motivated to demonstrate their skills are more likely to participate.
- The use of DBs in demonstrating to employers something that 'not everyone has' but if everyone does have them then this potentially dilutes their value to students.
- The opportunity for students to gather evidence and information relevant for job applications.

2. Student Perceptions of Digital Badges as Recognition of Achievement and Engagement in Co-curricular Activities (Glover 2016)

In this study, DBs were used to replace paper certificates recognising student participation as peer representatives at Sheffield Hallam University.

46/89 participants responded to an anonymous online survey, with 67% seeing DBs as useful for promoting themselves to employers. 26 claimed their badges, 19 shared them on social media, 17 of whom used LinkedIn – suggesting that DBs can enhance professional profiles, and 10 targeted potential employers. 71% said that they would like to receive DBs for formal, taught modules.

However, credibility was an issue. One reason was their association with childhood merit badges and another that DBs are a less widely recognised and intangible method of representing experience and learning than paper certificates. The findings also suggest that the 'utility of DBs is directly linked to their wider acceptance'.

3. Perceptions and Uses of Digital Badges for Professional Learning Development in Higher Education (Dyjur and Lindstrom 2017)

This study of instructors and graduate students at a Canadian HE undertaking professional development, report similar findings that DBs were less prestigious than paper certificates. Although, in this case few said they would send the badge to a potential employer.

4. Been there, done it, badge it! Information literacy and the use of digital badges at Middlesex University (Rizvi 2016)

At Middlesex University, DBs were attached to the teaching of Information Literacy for students, in the UK and China, needing to improve their English language and academic writing skills to enrol on a main degree programme. Whilst most students found collecting badges useful, the concern remains that 'without the endorsement of recognised external bodies or significant employers the badges may lack sufficient value as standalone certification of employability skills.'

Whilst value/credibility is emerging as an issue, this may not be the case where DBs are awarded by industry:

5. The Digital Era Has Changed Marketing: A Guide To Using Industry Certifications And Exploration Of Student Perceptions Of Effectiveness (Laverie et al. 2020)

This study arises from the challenge marketing faculties face in preparing students for the marketplace and the novel use of third-party certifications to supplement traditional teaching methods, one of which - Salesforce Trailhead - is a badged format.

Whilst not strictly focused on the effectiveness of DBs, the quantitative study provides positive student feedback in terms of enjoyment, achieving competitive advantage and being able to demonstrate more than class concepts. Identified as being the 'first study to empirically demonstrate effectiveness from a student perspective', credibility is likely achieved by the verification from the third-party industry leader.

6. Value of Open Microcredentials to Earners and Issuers: A Case Study of National Instruments Open Badges (Young et al. 2019)

National Instruments (NI) produce engineering hardware and software and provide knowledge and skills training for users of its products. In 2017, the company piloted a badging program, which it extended in 2018. The case study explores the value of DBs for both earners and issuers undertaking NI's training. Value is determined by whether the DB is shared, recommended and future participation.

51% of 51 respondents in 2017 and 67% of 122 respondents in 2018 shared their DBs to social media (LinkedIn, Facebook etc.). However, this was higher for those seeking professional recognition - 78% of 18 respondents. Again, credibility emanates from industry awarded DBs rather than those gained in HE.

Another important point emerging from Glover (2016) and Miller et al. (2020) is that being voluntary schemes, participants are already motivated:

7. Perceptions of pre-service English teachers towards the use of digital badges (Başal and Kaynak 2020)

This study investigates the use of digital badges in an LMS at a state University in Turkey. The participants are 79 pre-service English teachers enrolled on two 14-week courses, 70% of whom found the DBs beneficial, although this relates to their 'happiness' in receiving a badge as opposed to evidencing employability skills.

One significant point it does highlight is that perceptions of DBs may be impacted by levels of performance – which links to the point that motivated students are more likely

to participate. It is suggested that perceptions of both lower and higher performing students are sought and compared.

8. Students' Perception of Using Digital Badges in Blended Learning Classrooms (Zhou et al. 2019)

In this study, a DB system with a leader board ranking was implemented in an 18-week course offered by a Chinese mainland university during the 2018 Spring Semester. Fifty-four students participated. The learning activities were based on a combination of online and offline methods using the Moodle system, with DBs awarded for achievement during the course.

Using Q methodology, three learner types were identified – Neutral, Extreme and Skeptical and their perceptions of DBs assessed. All three groups had a 'positive opinion of DBs'. For the Extreme learner, a competitive element was a motivating factor, yet for the other groups, the competitive context may 'harm educational outcomes', arguably because students focus on 'performance' rather than 'mastery' (Alt 2021).

The type of learner appears key in terms of what a DB is being used to achieve.

9. Using Open Badges to support student engagement and evidence-based practice (Harvey 2017)

This study arose from the success in incorporating DBs to evidence the work of iChamps – used to support the development of digital literacies at the University of Southampton. Based on the work at Deakin University (Hallmarks), a combination of DBs and e-portfolios were introduced to a first year Geography module promoting the development of professional skills.

The evidence is anecdotal, there being no formal evaluation, but here, the element of competition appears to be a driving force as students were 'keen to gain as much as they could through participation'. Nevertheless, of the ¾ completing, only ¼ applied for

their DBs, although work was ongoing to collaborate with the employability lead and 'inspire' students to display badges.

10. Enhancing the Delivery of Guidance and Employability (open badges)

Anecdotal evidence from one of the project researchers suggests that whilst participants see DBs as a good way to show their skills and help with finding a job, they remain sceptical about the validity of the DBs issued. An important point the researcher does identify is that a lack of digital competence in working with DBs might also be a bar.

The takeaway here is that the literature identifies a positive stance from students towards DBs and they are motivated to earn DBs to achieve employability. Nevertheless, uncertainty about whether employers/recruiters attach value to DBs means that their credibility remains a central issue. An interesting point that Anderson et al. (2017) make is that 'most students still don't know about the concept' so there is no student-led demand to drive DB adoption.

Staff perspective

Published literature

Whilst there is some research of the staff perspective, this is in relation to DBs generally as opposed to their role in employability. Nevertheless, the observations are important in assessing the impact of DBs:

1. How and why are digital badges being used in higher education in New Zealand? (Hartnett 2021)

This study concerns the use of Digital Badges within New Zealand's higher education sector. It is intended to extend the empirical research of DB use in higher education by investigating the staff perception of DBs in terms of their value and potential drawbacks. It is informed by the work of Abramovich and Wardrip (2016) - Impact of Badges on Motivation to Learning, Lockley, Derryberry and West (2016) - Drivers, Affordances and

Challenges of Digital Badges and Oliver (2019) - Making micro-credentials work – for learners, employers and providers.

Whilst the study does not identify anything new it reinforces the current position that little is known about DB use, that there remains a need to assess the perceptions of the various stakeholders and for a change in mind-set before DBs move from micro to macro level use.

Methodology

A Mixed method study:

- Anonymous online survey distributed via email and social media to academic and support staff in 27 public tertiary institutions (8 universities, 16 institutes of technology and polytechnics (ITP) and 3 *wānanga*) to determine knowledge and use. This resulted in 124 responses from 24 of the 27 institutions with the greatest responses from university staff representing faculties (58.9%).
- Follow-up semi-structured interviews of 14 (8 university; 6 ITP) willing participants.

Findings

53.5% (60/112) of respondents identified their institutions as using or intending to use DBs.

The top five perceived benefits of DBs were displaying and evidencing achievement, as a motivational tool and encouraging participation, and a means of recognising informal learning. Although the interviews revealed greater emphasis on being able to track progress and easily share expertise.

46% (52/114) indicated they had first-hand experience of using DBs, although 12 of those were in terms of their own professional development rather than with learners. The top three uses of DBs were to encourage participation, represent learning and motivate learners, but at a micro-level (individual subjects/units) rather than institution wide.

The top three perceived challenges, both from the survey and interviews were lack of knowledge, inconsistent use and lack of wide recognition. Although, interviewees identified that successful implementation would largely depend on ‘a clear, coherent, integrated approach’ and ‘staff support’.

2. An exploration of the utility of digital badging in higher education settings (Carey and Stefaniak 2018)

This study investigates how DBs are being used in HE with its focus on the design aspect of DBs. However, the semi-structured interviews with 10 individuals leading DB initiatives suggests that skills-based badges are more meaningful than participation badges, and that there needs to be extensive ‘buy-in’, especially by faculty, to mitigate workload.

3. Open Badges in the Scottish HE Sector: The use of technology and online resources to support student transitions (Anderson et al. 2017)

A small-scale project with the intention of taking a snapshot of the Scottish sector's position in relation to the use of Open Badges. The project reports on the current experience of Open Badges in Scottish HE with a view to providing guidance on their use in supporting student transitions ‘into, through and out of university’.

Methodology

The project consisted of:

- a questionnaire distributed to every Scottish HEI, focusing on practice; perceived benefits; and employability, to capture institutional knowledge of current practice and aspirations for OB use from a staff and student perspective.
- A sharing practice event hosted by The University of Dundee involving the project partners and 49 colleagues from a range of HE institutions and the college sector.
- Five case studies as illustrative examples of practice at Dundee, Edinburgh, Abertay, St Andrews and Aberdeen.

Findings

Many of the current examples of badge activity are local rather than institution-wide initiatives and some institutions are ‘actively resistant’ to adopting DBs. Reasons may be that:

- DBs have previously been described as a ‘conceptual struggle’ and ‘disruptive’
- Lack of knowledge about DBs
- Insufficient technical support and information provided for staff to encourage effective implementation
- DBs are ‘not quite there yet’, still regarded as ‘gimmicky’, and ‘tech for tech’s sake’
- Add 'additional pressures' for students – and staff - by creating a 'second tier' of assessment.

4. Are They Worth It? Faculty Perceptions of Digital Badges (Els et al. 2021)

This study considers the implementation of a DB programme to promote continuous learning and engagement within the faculty. The full paper could not be obtained but this is an excerpt provided by the OU Library. Although the faculty members are essentially ‘students’, the study is an interesting perspective of the faculty view of DBs generally. 108 faculty members responded:

- 25% participated
- 66.7% indicated they would not apply for their badges
- 40% did not intend using their badges
- The top 4 barriers to participating were –
    - Uncertainty of the value of DBs
    - Lack of time
    - Lack of awareness in how to apply for DB
    - Lack of interest

To a large extent, this mirrors the student perspective, although staff appear less enthusiastic about DBs as a concept.

That said, one benefit of DBs is that staff can track student progress – DBs not being earned can serve as an alert for intervention (Harvey, 2017).

Websites

The following is a summary of what is happening in other HE institutions. Mainly, DBs support extra-curricular activity and achieving digital skills, but some are knowledge specific:

Newcastle University

- Open Badges – for a range of school specific or other learning achievements. There is also scope for students to propose and develop their own badges.

Westminster University

- Westminster Employability Award - recognising extra-curricular activities

Cambridge University

- Employability Digital Badge - “FIT for the Workplace” digital badge, developed in collaboration with the university’s engineering society and awarded on completion of a series of 3 workshops: Soft skills, Skillset for VUCA (volatile, uncertain, complex and ambiguous) and People buy people.
- Global Engineer Digital Badge – introduced 2020 – 21 it is based on the GELS network (collaboration between the university, Coto enhance future engineers’ language skills in order to prepare them for the increasingly challenging demands of a globalised market). A DB is earned for each of four skills - language proficiency, presentation skills, writing excellence and inter-communication.

Lancaster University

- Digital skills certificate – available to students and staff who complete or attend at least 7 online courses/training sessions in e.g., creating accessible resources, information security, communication.

Coventry University Group

- Recognise progress with digital badges - for staff and students to show achievements via 131 badges recognising extra-curricular skills and knowledge related to e.g., collaborative online international learning, mentoring, skills and engineering specific.

The University of Edinburgh

- Digital skills toolkits and badges – available to students and staff to develop the six digital capabilities in the Digital Skills Framework as either beginner or advanced user. A DB is awarded for completing four of the advance activities.

The University of Derby

- Digital Practice Handbook – it appears that DBs may have been used as part of a pilot of JISC's digital capability discovery tool as part of the universities technology enhanced learning strategy 2017 – 2021. John Hill, the lead on this strategy states that DBs are being used – awaiting a response from the relevant contact.

Cardiff Metropolitan University

- Digital Badges at Cardiff Met – awarded in partnership with Credly to students and staff for completing select digital skills e.g., Collaboration with Teams, Photoshop Image Editor, SharePoint.

Coleg y Cymoedd

- Digital Tutorial Badges – a specific online learning site to support Personal Development alongside study. DB's earned for e.g., enterprise & entrepreneurship, target setting, prevent, time management, digital skills, digital citizenship

The following OU Webcast Digital badges in support of employability: a UK HE perspective (2017) provides a perspective from 3 speakers of their experience in

delivering DBs in HE. It also identifies some of the work being undertaken by various universities as well as employers utilising/recognising DBs.

An email exchange with Ian Glover highlights the risk-averse view of investing time and money into DBs has changed in the last few years. With more universities offering DBs he suggests they have become ‘normalised’.

The takeaway here is that staff have a negative view of DBs compared to students. As with students, this could be simply due to a lack of understanding about DBs and/or an assumption that DBs will involve an increased workload. ‘The lack of awareness of any institution-wide badge activity, is perhaps reflective of a lack of institutional drive towards the use of DBs’ (Anderson et al. 2017). Nevertheless, there is clearly a drive by certain HEs to embed skills competencies within DBs.

Employer perspective

Published literature:

It is accepted by the literature that there is very little known about the employer perspective. These are two of the most recent:

1. Digital badges: Pinning down employer challenges (Perkins and Pryor 2021)

Their study seeks to extend the ‘limited research into employer awareness, acceptance, and use of digital badges in recruitment practices’. It is informed by the work of Raish and Rimland (2016) - Employer Perceptions of Critical Information Literacy Skills and Digital Badges, and the Educational Credentials Come Of Age A Survey On The Use And Value Of Educational Credentials In Hiring (Gallagher 2018).

Methodology

A mixed method survey combining quantitative (closed questions), and qualitative (free-text questions) data collection conducted before and during the COVID-19 pandemic.

2017

The survey was emailed to 700 local, national and global employers representing 24 employment sectors. 73 (7%) responded from 19/24 employment sectors. All

respondents were involved in recruitment. The most responses were from the Energy/utilities, Law and Engineering sectors (14 – 18%), with Science, Teaching and Retail sectors amongst the lowest (> 4%). The largest number of responses were from super corporates (1000+ employees) – 34% and small businesses (10 – 49 employees) – 25%.

June 2020

A short follow-up qualitative (free-text) survey of 8 employers to explore their views on DBs following 'rapid digitisation and remote working necessitated by COVID-19'.

Findings

2017

97% were unfamiliar with the concept of DBs (only a large pharmaceutical company and a small charity were familiar). However, 62% indicated a positive interest in using DBs to validate skills, with 57% seeing DBs as a useful addition to traditional qualifications and 29% wanting to know more, particularly in terms of their value, credibility and security.

June 2020

Respondents see DBs as being useful in 'identifying and nurturing future talent,' especially with the 'shift to more skills-based selection and digital recruitment processes'; respondents emphasise the use of LinkedIn as a key employment tool.

2. Who cares about open badges? An examination of principals' perceptions of the usefulness of teacher open badges in the United States (Randall and West 2020)

This study investigates the employer perceptions of DBs from the perspective of school principals hiring primary and secondary teachers in the US.

An interesting aspect of the study is the use of two forms for the survey: one refers to digital badge and the other microcredential. This was to determine whether the 'negative connotations' associated with the term 'badge' might influence the respondents' perceptions of open badges.

Methodology

A mixed method short survey combining quantitative (closed questions) and qualitative (open-ended questions) data collection.

Initial exploratory questions rating DB/microcredential knowledge and 'impressiveness' in a candidates resume/portfolio were followed by a short video 'explaining the affordances of DB/microcredentials' and further questions to elicit any change in ratings. Thereafter, respondents were asked to rate the value of different types of badges e.g., participation, achievement etc., badge attributes e.g., evidence link, industry endorsement etc., and the importance of badge issuer.

Open ended questions sought to elicit views on badges in terms of usefulness and challenges in the hiring process.

The survey was emailed to 577 principals/assistant principals in 7 school districts and a charter school (independent publicly funded) in a single US state. 70 responded (40 DBs and 30 microcredential), the most from primary education (41) and mainly principals (43).

Findings

There is a general lack of familiarity with both 'digital badge' and 'microcredential' and the term used does not impact how an employer perceives their value. However, having watched the instructional video, 'their perceived usefulness significantly increased regardless of whether it was called a digital badge or a microcredential'.

Achievement, capability and soft skills badges, having evidence links/competency descriptions, and from established institutions (e.g., Universities), held the highest value for respondents. 57 respondents saw open badges as being 'helpful in the hiring process' in terms of attracting attention, and identifying skills sets and experience. 39 respondents regarded open badges as being 'useful' for tracking professional development.

Nevertheless, several challenges were identified:

- Time and amount of data to review
- Not a ‘make or break’ criterion
- Do not identify personal qualities e.g., relatability to others
- Credibility
- Regarded as another hurdle for candidates.

3. Supporting learners’ STEM-oriented career pathways with digital badges (Pitt et al. 2019)

This study documents the perspective of higher education and employment gatekeepers in terms of DBs increasing and diversifying the STEM workforce. 19 college admissions officers and 11 representatives from technology companies were interviewed. 47% had heard of DBs, with 20% having used DBs, and 70% enthusiastic about their use, especially for ‘illuminating applicants’ soft skills’ e.g., leadership, collaboration and communication. Two notable ‘opportunities’ of DBs are:

- Establishing the credibility of a learners’ accomplishments by getting some ‘real data’ about a student’s resourcefulness
- A quick, visual way to review and sort applicants, increasing efficiency

Nevertheless, credibility and quality remain barriers to implementation, along with the additional work and resources required to incorporate DBs.

4. Enhancing the Delivery of Guidance and Employability (open badges)

This project failed in making employers fully recognise the benefits of DBs, which highlights the need for the employers to get to know what a badge is.

Websites

The following are examples of companies using DBs and in what way:

Microsoft

- Create and award digital publicly verifiable badges in Teams

Siemens

- Digital Badges
- Work Experience Digital Badge – Awarded for successful completion of a work experience placement

Vodafone

- A digital credential system for employees to acquire a host of badges (158) related to work areas or skills to raise their professional profile.

Education and Training Foundation

- Essential Digital Skills Badges - awarded for the Essential Digital Skills CPD programme to recognise progress in each of the 5 areas of the Essential Digital Skills framework e.g., Using devices, creating and editing, being safe.

City and Guilds

- Digital credentials – Use open badges to offer digital credential service to HE and employers

Scottish Social Services Council

- Create a digital record of your achievements and skills - The SSSC, as the regulator for the social work, social care and early years workforce in Scotland, offer a wide range of Open badges. To date, Rob Stewart has not made contact.

Relevant to the credibility issue are the following (forwarded by Alan Fletcher):

- KMi digital badging and blockchain – with information on current research relating to blockchains, which have the capability of mitigating the credibility issue of DBs.
- Institute of Coding Badges – the novel use of blockchains and the new IoC Computing Accreditation Standard in helping to address the misalignment between skills provision and industry needs.

A response is awaited about investigating further.

The takeaway here is that employers have very much the same perceptions about DBs as students. For DBs to be successful, the ‘resultant impasse’ - badges not being ‘utilised by employers,’ therefore learners do not pursue them’ (Ahn et al. 2014) - needs to be broken. Attaching value and credibility can only be achieved if students, staff and employers understand the benefits and challenges of DBs and know how to use them effectively. Credibility may be mitigated using blockchains as a credentialling system, but further information is needed in relation to this.

RQ3 How can badges be developed to meet needs?

Assessment design and the credibility of issuing institutions are paramount to the value of DBs. Mitigating some of the challenges of DBs already highlighted will assist with their development to meet needs. Raising awareness will help promote the credibility of DBs, so the starting point appears to be stakeholder involvement from the outset: student, staff and employer.

Taking a student led approach is not unheard of; DBs are driven primarily by Students' Associations at the Universities of Edinburgh, Stirling and Dundee (Anderson et al. 2017). Students are more likely to enjoy, and be motivated by, a new pedagogical approach if they are 'given a voice in their own goal setting' (Laverie et al. 2020; Gibbons 2020). The type of learner is key in terms of what a DB seeks to achieve, so DB design has to take account of the differing abilities and learning styles (Başal and Kaynak 2020). The purpose of the DB should drive its design, so for differing abilities, adopting a hierarchy for students to move from lower to higher levels creates manageable milestones (Carey and Stefaniak 2018). Dyjur and Lindstrom (2017) also found that effort in graphic design promotes credibility. DB design should be 'professional looking and flexible', enabling users to 'display it in alternative platforms'. Design takes time and experimentation but taking an inclusive approach helps learners connect, thereby strengthening their engagement with DBs (MacKinnon 2021)

Staff have a negative perception of DBs. Trepulė et al.'s (2021) study How to Increase the Value of Digital Badges for Assessment and Recognition in Higher Education. A University Case highlights the need for teacher training in DB creation so that DBs are viewed as 'solid contemporary microcredentials' rather than a form of gamification. The EDGE project identifies that a limitation of DBs is a necessity for a certain level of digital literacy, so step-by-step YouTube videos and guides were made available to staff. A similar project in Finland, focused on upskilling vocational teachers in digital and pedagogical skills, saw 14,000 badges completed. Acceptance relies on DBs being more available and known generally in education. Although somewhat counterproductive for Els et al. (2021), as Laverie et al. (2020) suggest, faculty should

be encouraged to badge themselves. Engaging staff with DBs would provide a digital and portable form for their CPD and introduce them to the concept of a DB approach, how that might then work for their students at the different stages of their academic study, and to investigate their own practice in this area (Anderson et al. 2017).

Perkins and Pryor (2021) suggest that a strong partnership between HEA and employers is needed for DBs to be effective. There is clearly scope to involve employers. Anderson et al. (2017) identify that one institution has 'collaborated with the Law Society of Scotland who help to assess group badges, and have discussed them with local employers', and another that discussions had been held with employers who 'in principle' were 'keen to contribute'.

There is a need to balance pedagogical digital badge practice with employer needs. Wayne Gibbons's DB developed in association with RPS - a multinational engineering consultancy firm – is a good example of how this has been achieved GMIT Engineering Lecturer Develops Digital Badge Recognising Essential Skills & Qualities In Graduates. Another is seen in the partnership between IBM and Northeastern University (Leaser et al. 2020). The section 'Lessons learned, and recommendations' highlights the need for mapping of DBs to the curriculum outcomes, robust communication strategies and clear and precise badge detail. Limited metadata is of limited value (Trepulė et al. 2021) – but this needs to be set against Randall and West's (2020) observation that one of the challenges identified by employers is the time and amount of data to review. Likewise, to be credible, DBs need to be universally recognised and valued. Quality assurance is necessary, however, as Carey and Stefaniak's (2018) study found, standardisation can undermine the purpose of DBs – their ethos being to 'get past traditional mechanisms'.

The Seven Deadly Sins Of Digital Badging In Education (Markowitz 2018) identifies 7 mistakes in introducing badges.

The takeaway here is that attention to DB design and the needs of each stakeholder can promote greater acceptance of DBs in terms of credibility and validity.

RQ5 The role of badges in inclusion, retention and employability

Whilst many of the research papers previously referred to cover these aspects, the following provides more detailed observations:

Inclusion

Good Work - The Taylor Review of Modern Working Practices (Taylor 2017) states that the opportunity to develop and progress should be available to all'. DB's are significant in 'promoting equity' for the less academically minded and those not completing their degrees. In Miller et al.'s (2020) study, students 'expressed appreciation' that DBs were 'open' to everyone and not just the high achievers. The very fact that DBs give 'visibility to a student's learning pathway' means that all students can represent their achievements throughout their studies, helping to fill Pitt et al.'s (2019) 'disconnect' between what students study at school, career aspirations and opportunities.

There are a couple of Erasmus+ funded projects where DBs are being used in adult education:

Open Badges for adult education – An OpenBadges project aimed at testing and promoting the use of Mozilla Open Badges among adult education organisations, educators and learners at ground level. There is a Facebook site, but posting stops in 2018 and further information in terms of outcome cannot be located.

The InnoVal Project – explores the benefits of non-traditional assessment methods for validation for low skilled adults, migrants/refugees. A couple of case studies are relevant in terms of DBs:

- Enhancing the Delivery of Guidance and Employability (open badges) – a project running from 2015 - 17 comprising adult/further education providers from Ireland, Wales, Austria, Greece and Portugal. The aim was enhancing the progression prospects of socio-economically disadvantaged adults and young people to promote social inclusion and equality measures through employability skills

development. 30 Open Badges were developed and hosted by Adult Learning Wales. Unfortunately, the final report cannot be accessed.

- Finland: Evaluation with Open Badges (oppimismerkit) – one aspect of this was Omnia, a multisector education provider of lifelong learning and vocational training, working with the Finnish Red Cross and Accenture using open badges to map refugees' skills. This was because it was difficult to assess a refugees competence with a form that is not easily transferable/translatable between countries. Refugees were introduced to working life and met with employers, who assessed their competences, such as language and work life skills.

Following Bridging the Gap Between Digital Skills and Employability for Vulnerable Populations (Lyons et al. 2019), these examples highlight the role of DBs in bridging the disconnect, by creating a wider range of educational pathways for the vulnerable and disadvantaged population to acquire valuable skills, thereby promoting employability.

Retention

Varying assumptions are made about students entering HE – that they have the necessary skills sets and are digitally literate. As Mah (2016) identifies, students lacking these skills are at risk of failing and dropping out of HE. DBs create a digital footprint that can be used to track progress. Attaching DBs to generic skills e.g., critical thinking, time management, not only helps students focus on their strengths and weaknesses but also serves as an early warning system to identify struggling students in need of timely intervention.

Retention is also impacted by motivation and Risquez et al. (2020) found that for time-poor academics undertaking CPD, DBs 'served as a motivator for engagement and completion'. However, DBs did not have the same impact for initial engagement, or where participants were driven by the course content. Arguably, differing learning goals is why Alt (2021) in Who benefits from digital badges? Motivational precursors of digital badge usages in higher education suggests that DBs should not be seen as a source of motivation or promoted as such.

Employability

Of particular interest is Miller et al.'s (2020) 'unintended outcome' that DBs can help students develop as 'citizen scholars' i.e., their personal identity and social engagement. Perkins and Pryor's (2021) study found that students should 'get involved with social media and embrace digital literacy training'. This is important given that larger employers prefer students to showcase their achievements using digital CVs and LinkedIn as they can "search with greater accuracy students/graduates who have demonstrated/verified capability in specific skill sets". Although a Credly promotional video, the following is how sharing DBs using social media and LinkedIn created a job opportunity:

Learn How One IT Professional Used Digital Credentials to Improve Her Employability

Anderson et al. (2017) found that some institutions not only encourage, but also provide training, for their students to display their badges on LinkedIn.

This is an interesting use of DBs to support employability from the University of Huddersfield:

- Artificial Intelligence Skills Bootcamp at the University of Huddersfield – offered in collaboration with the Institute of Coding, and funded by the DOE, it provides an opportunity for 19+ long-term unemployed, disadvantaged groups, career changers, and those who need to re-focus coming out of furlough to build both tech and non-tech skills through the study of bite-sized online modules hosted by iDEA and LinkedIn Learning content.

The takeaway here is that DBs serve as tools for inclusion, retention and employability but not as a stand-alone concept. Instead, as Alt (2021) suggests, they should be used 'jointly' with other strategies.

Conclusion

DBs are undoubtedly perceived as being beneficial for both students and employers. Having research from the employer perspective is useful in guiding this desk-based study, particularly in terms of what employers expect from DBs. It is also encouraging to see DBs in industry being awarded and shared with relatively few issues.

However, staff remain less convinced of DBs, and issues surrounding their credibility and value remain. Nevertheless, this study has uncovered some rays of positivity. The increasing number of universities and companies engaging with DBs, and the use of blockchains as verification, suggest a sea-change in terms of buy-in which can only serve to drive DB use as an employability tool.

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