Digital Open Badge-Driven Learning 3.4

Practical applications to support Validation of Prior Learning

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In the future, digital open badges can be integrated into different studies in order to support "the process of identifying, documenting, assessing and certifying the learning outcomes of individuals acquired within and outside formal education and training," as presented in the preamble of the Berlin Declaration on Validation of Prior Learning (3rd VPL Biennale, 2019, p. 1). They also provide "visibility and value to all forms of learning and seek to uncover and unlock latent talent in the workforce and in society" (3rd VPL Biennale, 2019, p. 1). Students' personal badge repositories may include different badges from a variety of badge issuers from distinct study programmes with varying evidence of achievements. The open badge management system allows one to acquire competences in formal, non-formal and informal studies. Skills and knowledge may be recognised in small fractions as well as in large sets. Badges describe achievements in greater detail, complementing degree certificates and transforming curricula into personalised degree programs. The process will enable multidimensional dialogue between badge earners, employers, educational institutions and education developers (Brauer, Ruhalahti, & Pakanen, 2018). The criteria for future skills and knowledge are developing and evolving while staying compatible with the nationwide administration and learning management systems. A common European standard allows one to link badges acquired from different places using the International Europass of Lifelong Learning. Badges offer a way to inform and improve learning outcomes in a transferable form, as well as to scaffold and assess learning, thus allowing efficient use of learning analytics. The student is in charge of his/her own ongoing learning process, which is thus scaffolded by professionals just in time instead of just in case. Meanwhile, the flow of learning is supported by inspiring gamification. (Brauer, 2019, p. 91)

The narration above aligns with the description of the path towards advanced digital learning ecosystems and blockchain technology in Finland represented in my recently published doctoral dissertation, "Digital Open Badge-Driven Learning - Competence-Based Professional Development for Vocational Teachers" (Brauer, 2019). None of the above illustrates possible future scenarios, but all of the presented issues relate to ongoing or upcoming development projects.

The ongoing changes in the paradigm of continuing professional development (Kools & Stoll, 2016) necessitate supportive technological and digital pedagogical models. The current development and research related to digital open badge-driven learning (Brauer, 2019; Brauer, Kettunen, & Hallikainen, 2018; Brauer, Korhonen, & Siklander, 2019; Brauer, Siklander, & Ruhalahti, 2017; Brauer, Ruhalahti, & Hallikainen, 2018; Kullaslahti, Ruhalahti, & Brauer, 2019) contributes to the educational discourse on competence-based approaches, assessment and professional development. Moreover, the recent findings allow a definition

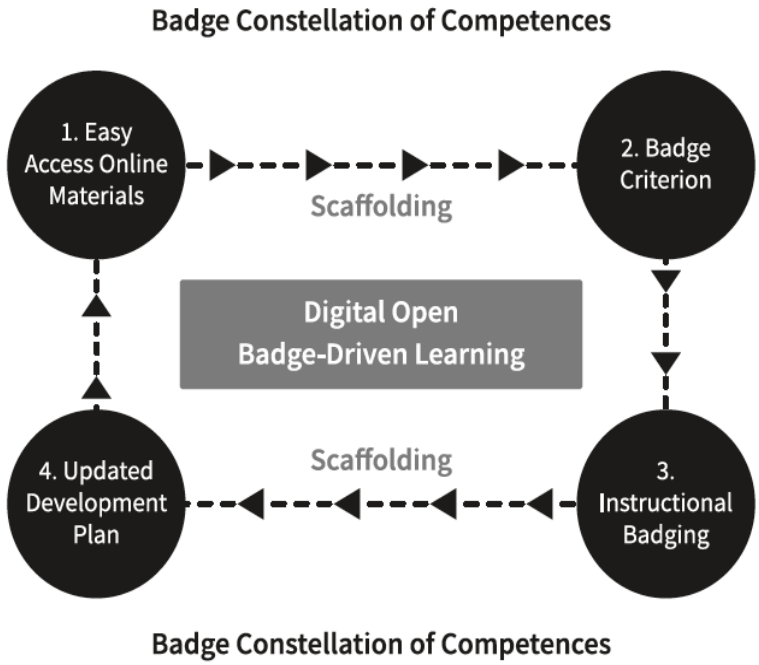
of the process of badge-driven learning, facilitate the identification of open badge management platforms as new learning environments and suggest an application to design badge-driven learning. Additionally, the process approach brings to the fore the significance of customisation and personalisation of study paths in order to meet unique professional needs. My doctoral dissertation focuses on the challenge of supporting teachers' professional development. The nationally exceptional success of the studied professional development programme (PDP) draws heightened attention to digital badging and gamification in educational contexts. The programme's outstanding learning outcomes have led Finland to develop the model on a national level within different degrees and various disciplines.

Advanced Digital Badging to Support Validation of Prior Learning

Previously acquired competences are important to the individual in the pedagogical process; when educational institutions increase their capacity to engage in the ongoing assessment of competences, remarkable improvements can be achieved. However, the official guidelines are not always the best tool for individuals seeking to identify personal competences or to comprehend the needs of development in practice. Based on five years of experience in the development of a competence-based PDP and research into digital badging, I suggest that digital open badges be explored and applied in different disciplines.

The main research question of my doctoral dissertation was focused on how digital open badges structure the gamified competence-based learning process in the continuing professional development of vocational pre- and in-service teachers. The study results allowed me to identify the different qualities of digital open badge-driven learning and describe the overall structure of the badge-driven learning process (Figure 1).

Figure 1. Identified structure for the gamified digital open badge-driven learning process



Source: Brauer, 2019

The study findings have allowed me to reach a definition of digital open badge-driven learning as a competence-based learning process grounded in the badge constellation of competences. The process includes identifying and recognising different competences using digital open badges. The entity of digital open badge-driven learning involves learning materials, badge criteria, instructional badging, scaffolding and peer support. The related learning process supports the gamification of professional competence development (Figure 1). Further, the triggers of the learning process are more versatile than the triggers of gamification or online learning alone. The trigger for digital open badge-driven learning might be realised at different stages of the learning process and in various forms, including community building and collaboration facilitated by gamification, scaffolding or criterion-based challenges.

The main principles of digital open badge-driven learning allow the design model to be focused to meet unique personal needs, progression to be made towards peer and community learning and excellence to be recognised within working communities. Previous research related to this learning type has focused on the initial process of digital badging, the essence of issuing and receiving badges (Hrastinski et al., 2018). However, digital open badges offer a way to recognise "the expanded landscape of learning" (Grant, 2014, p. 5) and empower alternative ways of acquiring knowledge and skills (Brauer et al., 2017; Devedžić & Jovanović, 2015; Knight & Casilli, 2012). Effective badge design is complex by nature, with different mechanics and psychological factors affecting the identification and recognition of competences and the eventual earning of badges (McDaniel & Fanfarelli, 2016).
Knight and Casilli (2012) describe the scale of customisation required for such learning processes as a connected learning ecology serving as a bridge between contexts and alternative learning channels. The world of digital badging is growing, as anyone can create badges and recognise the achievements of others (Mozilla Open Badges, 2017); consequently, there is strong demand for guidelines and digital pedagogical models for educators to follow and apply. In the future, more research is needed to improve flexible professional competence development and cultivate a trustworthy way to identify, validate and recognise different competences.

Emerging Digital Learning Ecosystems in Finland

Different Finnish educational institutions and training providers have been applying digital open badges in learning processes. Trainers in vocational teacher programs (Isacsson, Stigmar, & Amhag, 2018) are in charge of the pre- and in-service training of professional teachers working in vocational education and training (VET). In Finland, these trainers have been the first to deliver educational reform and to observe the effects of digitalisation on different disciplines (Brauer, 2019; Koramo, Brauer, & Jauhola, 2018). As a focus group piloting digital open badge-driven learning, their experiences, views and ideas are more than noteworthy. In practice, digital open badges offer to inform and improve both professional development and professional knowledge constructions to develop different competences.
It is essential that standards and guidelines are developed on both a national and a European level (Kullaslahti et al., 2019); however, to best serve students, trainers need to learn how to apply the competence-based approach in practice and further develop their digital pedagogical competences and practical applications. The following chapters explain the latest developments related to open badges in Finland, originating from the significant success of the first massive open online badge-driven programme of continuing professional

development (CPD) for VET teachers. It also covers national professional development initiatives developed based on the most advantageous lessons learned in the past five years.

Learning Online – Professional Development for Vocational Teachers

In 2014, two schools of professional teacher education (Oulu University of Applied Sciences and HAMK University of Applied Sciences) joined forces with VET provider Omnia, the Joint Authority of Education in Espoo. Together, the partners sought to restructure CPD to design a competence-based PDP that would support teachers in building working-life Information and Communications Technology (ICT) skills and knowledge.

As as result, they co-created Learning Online PDP, a gamified, open badge-based massive open online course (MOOC). The aim of Learning Online is to support VET teachers in applying new technologies and strategies for teaching and learning in online, hybrid and face-to-face learning environments (Brauer et al., 2017). In Learning Online, digital open badges offer novel possibilities for identifying and recognising digital pedagogical competences independent of how they were acquired. The design also considers several other aspects of modern culture, including digitalisation, the meaningful use of gamification in learning and the public sharing of expertise in order to support shared learning within work communities. The Learning Online concept was built as part of an OsaOppi project funded by the Finnish National Agency for Education (Edufi) in 2014 and has been in development ever since.

As the scheme of continuing professional development should reflect the sum of competences required from teachers (Day, 2017), the foundation of the PDP rests on competence criteria that adhere to the national guidelines (Ope.fi) adapted from Unesco's ICT-CFT (Unesco, 2011). As different digital pedagogical competence frameworks support teaching personnel, in Learning Online, the three successive stages follow a level structure: SoMe-Novice, SoMe-Expert and SoMe-Developer (I, II and III, with SoMe referring to social media). The levels refer to the skill sets of personal development, shared expertise and strategic development on the organisational level.

One cornerstone of the design involved creating an educational setting that would encourage participants to apply acquired skills and knowledge immediately in practice (Brauer, Kettunen, & Hallikainen, 2018). In Learning Online, digital open badges visualise the requisite skill-set levels in a way that allows the participants to plan and customise their personal study paths (see also Brauer, 2019, p. 36-39). The participants apply for competence-based digital badges by providing the required evidence of the competence in question. The assessment process is transparent and egalitarian, as teacher trainers from different schools of professional teacher education collaboratively facilitate the application and issuing process in the open badge management system (Open Badge Factory). Scaffolding related to the remediation and rejection of badge applications is also provided, and participants are engaged in a Facebook-based study group.

The original aim of the Learning Online initiative was to develop inspiring in-service training for vocational teachers by implementing new methods of easy-access online learning. In Learning Online, learning materials and badges are readily accessible 24/7 online and are open to anyone interested in developing digital pedagogy and vocational training. All contents are openly licensed with Creative Commons. Themed learning materials supplement instructional badge criteria and are tagged for different search options. One goal for the initial pilot was to offer an economical example of an open online education implementation designed by average teacher trainers without specific technological expertise (such as coding skills) using free online products and services. The Learning Online

landing site is simply a free WordPress blog (http://www.oppiminenonline.com/), and the tools used to monitor learning were built from different gadgets available on the WordPress site and tools such as Google Forms.
The working group was also keen on applying gamification in online learning. In Learning Online, digital open badges represent a major tool for game design (Brauer & Siklander, 2017; Deterding, 2015). After conducting thorough research on and comparisons between different technical settings, designers settled on Mozilla Open Badges and Open Badge Factory to power the game engine of Learning Online. Badges visualise the requisite skill sets levels: "I-III...bronze, silver and gold and are earned by achieving 10, 25 and 45 badges, respectively" (Stockley, Lius, & Brauer, 2017, n. p.). Each basic badge belongs to a constellation of similarly themed badges encouraging teachers to continue to develop their competences and reach the next skill-set level. Further, the design is intended to support a community experience and inclusion through online study groups and competition between locational teams. A live leaderboard is displayed on the site to motivate competitors to go the extra mile, while high-ranking teams seek to keep their lead (Stockley et al., 2017, n. p.). Badges also provide a chance to promote a meaningful learning experience, a sense of community and the experience of inclusion and equality (Mäki et al., 2015).

Over the years, the project grew to provide an open-access educational setting available to anyone interested in developing vocational education and training, teachers' ICT competences and digital open badging. Since 2015, badges have been piloted in professional teacher education qualification programs for VET pre-service teachers, and the results speak for themselves. As of August 2019, users have applied for (and received evaluations for) 21,687 Learning Online badges. Of these, 1,847 applications (~9%) were rejected and 1,792 (~8%) were pending; teacher trainers have guided those applicants who were marked pending towards the intended learning outcomes. The acceptance rates (where the badge receiver transfers the badge to a badge repository) are currently at 92%.
The goal was to develop the use of open badges as an accreditation of teachers' ICT competence development and to execute an inspiring form of gamification. The programme exceeded all intended learning outcomes in the first year in terms of both quantity and quality. Moreover, the PDP was awarded the 2015 eEemeli Quality Prize in an annual e-learning competition organised by the Association of Finnish eLearning Centre (https://www.eoppimiskeskus.fi/en/) for improving the quality of e-learning operations and activities in Finland. Obviously, digital open badges have become a successful tool in Finland for fostering vocational teachers' professional development.

Teachers' Badges Initiative
Interest in badging shows no sign of slowing down in the immediate future as the National Initiative of Teacher's Badges follows in the footsteps of Learning Online by offering to create and establish a national digital badge system to support the recognition and acknowledgment of professional competences for vocational teachers (HAMK, 2018). The project is run on a national level within several higher education institutions and is intended to establish a formalised recognition ecosystem supervised by Finland's Ministry of Education, as well as to further explore the broader sociotechnical contexts in which the badge constellations could exist.
The great autonomy of Finnish teachers highlights their responsibility for maintaining their own competences. The skills and knowledge acquired during professional teacher training (60 ECTS credits to gain a teacher's qualification) are insufficient for the lifetime career of a

vocational teacher. However, current CPD methods do not inspire teachers to continually advance their own knowledge and skills for their professional lives (Kools & Stoll, 2016).

To ensure teachers' professional development, their training should be considered a competence-development continuum supporting professional growth (Mahlamäki-Kultanen et al., 2014). The challenge in opening up such a continuum in continuing professional development rests in how to support pre-service teachers in creating a personal plan for CPD. This plan should inspire them to develop their competences as future in-service teachers and to strengthen their self-motivation as well. The Teacher's Badges Project aims to create and establish "a national digital badges system to support the recognition and acknowledgi ement of professional competences of vocational teachers during their teacher studies as well as their entire professional career" (HAMK, 2018).

Badges to Meet the Requirements of Working Life

Digital open badges encapsulate the individual learning experience and tie performance and achievement to documentation and evidence of learning (Ahn, Pellicone, & Butler, 2014; Gamrat, Bixler, and Raish, 2016; Reid, Paster, & Abramovich, 2015). They also offer a method of supporting a shared understanding of required and desired competences between different stakeholders.

The Chips for Game Skills project (Brauer, Ruhalahti, & Pakanen, 2018) aims to define criteria for future skills in the gaming industry and to cross the boundaries of educational institutions. The goal is to provide badges based on the needs of working life as proof of the required level of mastery in specific areas of expertise. The badge constellation of competences is focused on promoting the identification and recognition of working life opportunities (the needs of working life) while helping the student to plan the development of competences (optional study paths) as a future professional in the gaming industry.

'Work-Integrated Pedagogy in Higher Education' (Workpeda), a new nationwide project, aims to pilot digital open badges in academic universities and higher education contexts to improve students' working life competences and enhance alumni cooperation. Workpeda is intended to build the first national pilot of digital open badge-driven learning within the problem-solving case studies of the University of Oulu's Learning, Education and Technology (LET) master's programme in close connection with the latest research. Working-life connections are highlighted throughout the master's studies. The aim is to determine desired competences in relation to students' individual interests and the recognised needs of working life, as well as to define the concept of desired competences in digital open badge-driven learning and the competence-based approach based on students' point of view. (Brauer & Talonen, 2019)

Competitive Skills - National Open Badge Constellation of Problem Solving in Technology-Rich Environments

In Finland, we have already learned that digital open badges substantially support the competence-development continuum of professional growth in the contexts of vocational teacher programs, professional development and higher education. The latest major investment in Finland is aimed at developing a nationwide open badge constellation for the field of vocational education and training (secondary degrees). This enables the verification of adults' problem-solving skills in technology-rich environments (PSTRE) by identifying and recognising competences acquired outside the formal education system, at different levels of education and in transitional phases of the education structure. Additionally, the project

provides a required framework of competence (determining the composition of objectives, core content and assessment criteria) for securing ICT-related problem-solving skills (PIAAC) in formal and non-formal education.
The project will create a competence-based skill set for people with inadequate ICT and data management abilities and a national competence constellation for problem-solving skills in information technology, to be piloted with different target groups within vocational and adult education. The training takes advantage of modules created in previous projects, e.g. 'Digital path to work,' where the competence-based digital badges visualise the learning outcomes and guide the competence-based learning process as a tool for assessment.
The pilot projects will ensure the students involved in the pilots develop basic ICT and data management skills and will familiarise trainers and teachers with digital open badge-driven learning. In the pilot projects of liberal adult education, the skills of trainers are also verified with special competence-based badges. The badge constellation of competences will be readjusted based on the experiences of pilot project instructors, teachers and students until published.
The 'Competitive Skills' process and structures of the national open badge constellation will be described in forthcoming research publications, and the model will be published via The Finnish Information Society Development Centre (Tieke), through which the system will also be centrally updated and managed in the future. The Tieke website will also contain the required framework of competence (determining the composition of learning objectives, core content and assessment criteria) for securing ICT-related problem-solving skills in non-degree-based training. This will allow an equal, egalitarian and transparent way of ensuring future ICT-skills in different types of training and different organisations. The model will be published with a Creative Commons licence and will be freely available to various training providers for noncommercial purposes.

Views to and Recommendations for the Future of VPL

In the digital era, VET institutions have emerged as transformational and flexible development environments. Several projects are developing and evolving, including a revision of the Europass framework, the New Europass and a standard to allow Europe-wide administration and learning management systems (European Union, 2018). The New Skills Agenda for Europe invites member States, social partners, industry and other stakeholders to work together on ten actions to improve the quality and relevance of skills formation, to make skills more visible and comparable and to improve skills intelligence and especially information for better career choices (European Union, 2018, p. 2).
In Finland, the CompLeap – A Learner Centered Digital Ecosystem of Competence Development -project (CSC, 2019) is answering the call to seek out better career choices with gamification. The list of related projects could continue indefinitely; change is evident. Finns are even building artificial intelligence (AI) applications in the public sector (Ministry of Finance, 2018) to serve digital learning ecosystems that allow learning to be omnipresent.

Digitalisation itself refers to a process in which analogue information and processes are converted into digital format (Brenner & Kreiss, 2014). Day-to-day digital technologies blur the everyday lives of individuals and communities. Digitalisation is transforming society, changing how we work, communicate, learn and share knowledge. The literature is replete with evidence examining these changes in working life, with concurrent investigations occurring in all disciplines. Due to these significant changes, it has become increasingly important to develop solutions that meet the requirements of digitised working life. Such

applications must increase individuals' capabilities using a sustainable form of competence-based education and training. We simply can no longer afford to begin training from ground zero. (Brauer, 2019, p. 20)

The Berlin Declaration and open badges

To finalise this discussion of different examples, I will collate the Berlin Declaration of VPL sections 1–5 (*in italics*) to the process model of digital open badge-driven learning (Brauer, 2019).

1.1 VPL should have clear entry points for the individual which are widely advocated and accessible for all.

Digital open badge-driven learning should provide a home base with easily accessible learning materials and instructions for the badge application process available 24/7 online. However, different stakeholders have various value expectations of badges. In digital open badge-driven learning, scaffolding is not considered to be a stage, but an ongoing activity penetrating different stages, structures and layers of the entire process. In practice, digital open badges offer to inform and improve both professional development and professional knowledge constructions.

Learning pathways should include collaboration between different badge stakeholders *so that VPL and its results hold value and are highly recognised in society.* Frameworks of knowledge provide differing interpretations of national and personal development (European Commission/EACEA/Eurydice, 2018). Finland aims to create and establish different national digital badge systems to support the recognition and acknowledgment of professional competences in different disciplines.

2.4 The costs and benefits of VPL, including its social and economic impact, should be monitored, analysed and shared with stakeholders.

Digital open badges and the competence-based approach seek to meet the requirements of social and technological change while tackling economic challenges (Vähäsantanen, 2015) by means of effective and meaningful criterion-based competence development. Piloted badges are open to anyone interested in developing digital pedagogy and vocational training. Badges introduce new ways to validate learning outcomes already on the learning pathway, e.g. in liberal education.

"...lifelong learners to take modules at different institutions and obtain their degree. Flexible education is no longer based on educational programmes with a fixed curriculum" (Kerver & Riksen, 2016, p. 6). The whole concept of education management and its principles of funding should be reviewed. The Teacher's Badges Project aims to create and establish a national digital badge system to support information management in Finland.

3.1 Quality assurance mechanisms need to be in place to ensure that assessment tools and instruments are valid, reliable, fair and sustainable.

The assessment process is transparent and egalitarian as trainers collaboratively facilitate the application and issuing process in the open badge management system. *Trusted, recognised and updatable instruments should enable flexible, individualised pathways and accommodate the diversity of candidates and learning paths.* A carefully designed badge constellation promotes the student's progress, allowing remarkable customisation. Knight and Casilli (2012) describe the scale of customisation required for

such learning processes as a connected learning ecology serving as a bridge between contexts and alternative learning channels. *Validation procedures need to refer to agreed standards, such as NQFs and/or sector-specific standards, expressed in terms of learning outcomes.*

3.4 Validation pathways need to be modular, transparent and comprehensible at all stages of the process in order to allow for flexible work and education pathways.
The outcome of the digital badging *should grant credits which allow for exemptions to shorten study time, lead to a full or partial qualification or open up new routes to education and work. Specialist training and certification of assessors is needed in order to ensure an open-minded, competent and non-discriminatory approach.* However, badges may also be granted by different peer-review processes and in working life cooperatation. Identification, recognition and validation of different competences by badging *should be accessible without any prerequisite level of formal qualification.*

4.1 Information provision and raised awareness of the value of people's informal learning experiences should be embedded in learning, career guidance and work.
Accessible guidance and support needs to be provided before, during and after all phases of validation in the badge-driven learning process. Badges provide *visible entry points to the validation scheme which are available both online and offline. Specialist training and certification/validation for VPL* and badging *practitioners is necessary. Assessors should ensure an objective, fair and transparent process during the assessment and certification phases.*

5.1. VPL should facilitate an individual's personal development and mobility horizontally, vertically and diagonally within and between organisations, sectors and/or countries.
Digital open badges should be *transparent, reliable and trustworthy for all stakeholders.* Where relevant, badges *need to be equivalent to formal learning certificates so that they hold the same value in the job market and education system and form solid building blocks for further learning and work pathways. Based on the achieved badges, further learning options can be offered and adapted to the individual's learning preferences. The individual learner is empowered through being an active agent in the creation of functional learning and working pathways, alongside the responsibilities of the education system, employers and social partners.*
Further, *laws and regulations need to be reviewed on a regular basis to allow the evolution of the VPL system* and digital open badging practices.

Closing Remarks

In conclusion, digital open badges promise to empower VPL further. They also permit efficient use of learning analytics and inspire gamification that supports consistent competence development as a continuum in the post-validation process. A hybrid model of competence recognition and gamified learning applications could maximize impacts on learner achievement and enhance intrinsic motivation for competence development (Brauer et al., 2017; Reid et al., 2015). As Devedžić and Jovanović (2015) point out, digital badges are "fully aligned with and supportive of the notion of Digital Learning Ecosystems (Laanpere, Pata, Normak, & Poldoja, 2014) and the practice of Connected Learning (Ito et al., 2013) that put the learner in the center and give them significant freedom and flexibility in shaping their learning environments" (p. 605). This should be in line also with the future development of

assessment practices that would identify the skills acquired in working and everyday life while acknowledging the whole set of competences acquired e.g. within the new EuroPass - documentary.

There is an evident need to develop knowledge regarding novel approaches to professional learning and competence development. Networked European research efforts are needed to develop accredited badging practices as a pan-European or even global system for "identifying, documenting, assessing and certifying the learning outcomes of individuals acquired within and outside formal education and training" as presented in the preamble of the Berlin Declaration on Validation of Prior Learning (3rd VPL Biennale, 2019, p. 1). The development of badging practices is still in the hands of a few. I wish to invite everyone involved with digital open badges and related research to join shared efforts to promote the new era of competence-based approach and digital open badges.

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