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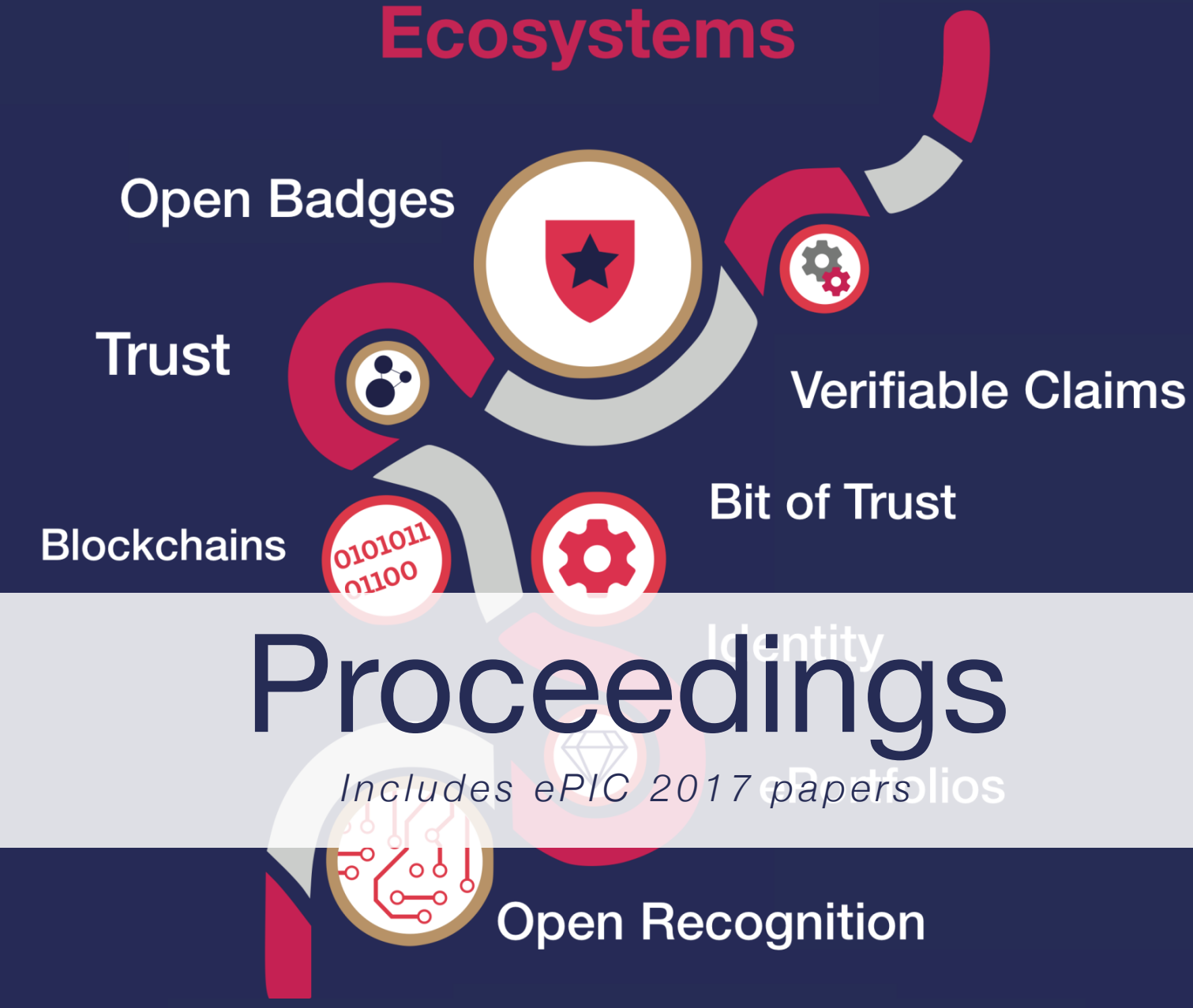

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Digital Open Badge-Driven Learning - Practical Applications to Support Emerging Ecosystems

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Abstract

There is a growing demand for economically effective accreditation practices that respond individually to local challenges and unique professional needs. Digital open badges offer to inform and improve learning outcomes, but also to scaffold and assess learning, thus permitting efficient use of learning analytics and inspiring gamification that supports consistent competence development as a continuum. This conference paper summarises the latest research concerning digital open badge-driven learning, and related development of assessment practices and digital open badges.

The entity of digital open badge-driven learning includes learning materials, badge criteria, instructional badging, scaffolding and peer support. The process model of digital open badge-driven learning is grounded on the badge constellation of competences. This summary offers insights and examples of applying the competence-based approach, digital open badges and gamification in professional development to meet teachers' personal needs for their working lives. In addition, it represents the current state of emerging ecosystems related to open badges in Finland.

Keywords: Digital Open Badges, Learning Ecosystems, Competence-based Approach, Motivation, Gamification, Professional Development

Introduction

In the future, digital open badges can be integrated into different studies in order to support the identification and recognition of required competences. The badge constellations include different badge families from a variety of degrees with varying challenges. 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 the 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 Life-Long Learning. Badges offer to inform and improve learning outcomes, but also to scaffold and assess learning, thus allowing efficient use of learning analytics. The student is in charge of his/her own learning process, thus scaffolding them 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 describes the path towards advanced digital learning ecosystems and blockchain technology in Finland represented in my recently published doctoral dissertation of “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 on-going or upcoming development projects.

The eident change in the paradigm of continuing professional development (Kools & Stoll, 2016) necessitates 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) 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, offer to identify open badge management platforms as new learning environments, and suggest an application to design badge-driven learning. The challenge to activate teachers’ professional development draws heightened attention to digital badging and gamification in educational contexts. In addition, the process approach brings to the fore the significance of customisation and personalisation of study paths in order to meet unique professional needs. Digital open badges offer substantially support the competence-development continuum of professional growth in the contexts of vocational teacher programs, professional development and higher education. (Brauer, 2019)

Emerging Digital Learning Ecosystems in Finland

Different Finnish educational institutions and training providers have been applying digital open badges in learning processes. Teacher trainers of 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, they have been the first to serve the educational reform and to see 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 the standards and guidelines are developed on a national and European level; however, to serve the 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 current state-of-the-art 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 and the national initiatives of professional development following 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 the VET provider Omnia, the Joint Authority of Education in Espoo. Together, partners sought to restructure the CPD to design a competence-based professional development program (PDP) that would support teachers in building working life ICT skills and knowledge.

As as result they co-created Learning Online PDP - a gamified, open badges-based MOOC (Massive Open Online Course). The Learning Online aims to support VET teachers in applying new technologies and strategies to teaching and learning in online, hybrid and face-to-face learning environments (Brauer, Siklander, & Ruhalahti, 2017). In Learning Online, digital open badges offer novel possibilities in identifying and recognising digital pedagogical competences independent of how they were acquired. The design considers several other aspects of modern cultures in the 21st century, including digitalisation, the meaningful use of gamification in learning and public sharing of expertise in order to support shared learning within work communities. The Learning Online concept was built during 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 following the national guidelines (Ope.fi) adapted from UNESCO's ICT-CFT (UNESCO, 2011). As different digital pedagogical competence frameworks seek to 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, SoMe referring to Social Media). The levels refer to 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 the 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, pp. 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 is provided related to the remediation and rejection of badge applications. Participants are also 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 easily accessible 24/7 online and 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 purpose of 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) while 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 site and Google tools, such as Forms.

The working group also was keen on applying gamification in online learning. In Learning Online, digital open badges represent a main tool of the game design (Brauer & Siklander, 2017; Deterding, 2015). After thorough research 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 the teachers to continue to develop their competences and reach the next skill set level. Further, the design aimed to support a community experience and inclusion in terms 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 first place competitors seek to keep their lead (Stockley et al., 2017, n. p.). Badges also provide a chance to promote a meaningful learning experience; sense of community, and the experience of inclusion, equality (Mäki et al., 2015).

Over the years, the project grew to provide an open access educational setting open 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. By January 2019, users have applied for (and received evaluations for) 20229 Learning Online Badges. 1835 applications (~9%) were rejected, 1562 applications (~9%) were pending and teacher trainers have guided these applicants 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 program exceeded all intended learning outcomes in the first year both in terms of quantity and quality. Moreover, the PDP was awarded the 2015 eEemeli Quality Prize in an annual eLearning competition organised by the Association of Finnish eLearning Centre (https://www.eoppimiskeskus.fi/en/) for improving the quality of eLearning operations and activities in Finland. Obviously, digital open badges have become a successful tool in Finland for fostering vocational teachers' professional development.

Teacher's 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 badges system to support the recognition and acknowledgment of professional competences for vocational teachers (HAMK, 2018, n.p.). The project is run on a national level within several institutions of higher education aimed to establish a formalised recognition ecosystem supervised by the Ministry of Education in Finland and to explore further the broader sociotechnical contexts in which the badge constellations could exist.

The great autonomy of Finnish teachers highlights their responsibility to take care of 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, the current methods of continuing professional development 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 facilitate pre-service teachers in creating a personal plan for CPD – a plan towards motivating 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 acknowledging of professional competences of vocational teachers during their teacher studies as well as their entire professional career" (HAMK, 2018, n.p.).

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 (Gamrat, Bixler, and Raish, 2016; Reid, Paster & Abramovich, 2015; Ahn, Pellicone & Butler, 2014). Respectively, digital open badges offer to support a shared understanding of the required and desired competences between different stakeholders.

The Chips for Game Skills project (Brauer, Ruhalahti, & Pakanen, 2018) aims to define the criteria for future skills in the gaming industry and to cross the boundaries of educational institutions in order 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 to promote the identification and recognition of working life opportunities (needs of working life) while helping the student to plan the development of competences (optional study paths) as a future professional of the gaming industry.

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

Further, several projects are developing and evolving, including a revision of the Europass framework, the New Europass and a standard to allow European-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 Project (CSC, 2018) is answering the call to seek out better career choices with gamification. The

list of related projects could continue indefinitely – change is evident. We Finns are even building applications of AI in the public sector (Ministry of Finance, 2018) to serve digital learning ecosystems that allow learning omnipresent.

Advanced Digital Badging to Support Learning

It is essential that the ecosystems and guidelines of such are developed on a national and European level; however, to serve the students, trainers need to learn how to apply the competence-based approach in practice and further develop their digital pedagogical competences and practical applications. 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 to explore and apply digital open badges in different disciplines.

The main research question of my doctoral dissertation addressed 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).

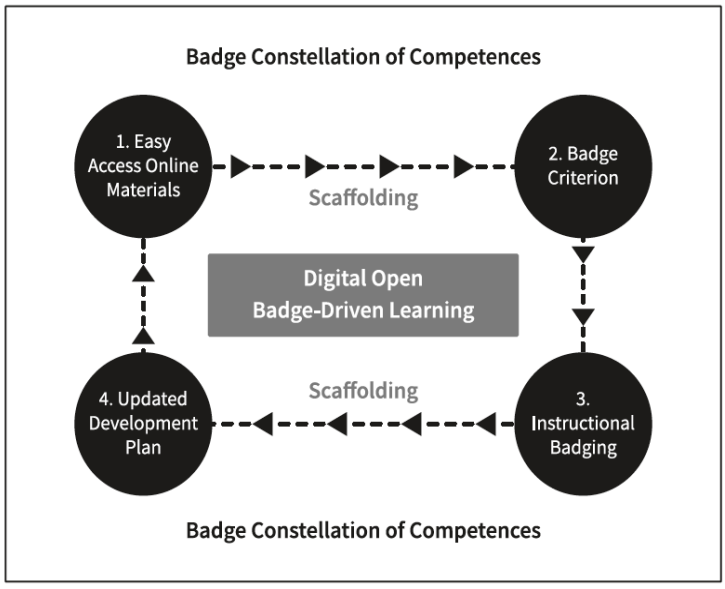

Figure 1. The identified structure for the gamified digital open badge-driven learning process (Brauer, 2019, p. 75).

The study findings have allowed me to reach a definition of digital open badge-driven learning as a competence-based learning process grounded on 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 criterion, instructional badging, scaffolding and peer support. The digital open badge-driven 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. In terms of digital open badge-driven learning, the prompting trigger for learning might be realised at different stages of the learning process 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 focusing the design model to meet unique personal needs, progression towards peer and community learning, and the recognition of excellence within working communities. Previous research related to digital open badge-driven learning 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 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). Respectively, the effective badge design is complex by nature with different mechanics and psychological factors affecting the identification and recognition of competences and 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 emerging 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 a trustworthy way to identify, validate and recognise different competences.

The original study was published in January 2019 in

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