FEATURE

Digital open badge-driven learning - a doctoral thesis summary

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Abstract

Digital open badges are gaining popularity as a means of identification and recognition of competences acquired differently. Meanwhile new ways to motivate, scaffold and assess competence-based learning processes in professional development are emerging. This feature offers a summary of the first European doctoral dissertation to address digital open badges and digital open badge-driven learning. The thesis represents a novel application of descriptive statistical methodology to the context of educational research. The primary results culminate in defining digital open badge-driven learning process grounded on the badge constellation of competences. The entity of badge-driven learning includes learning materials, badge criteria, instructional badging, scaffolding and peer support.

Keywords: Competence-based Approach, Digital Open Badge-Driven Learning, Motivation, Open Badges, Professional Development

Introduction

Digitalisation is transforming society, changing how we work, communicate, learn and share knowledge. Due to these significant changes, it has become important to develop competence-based education and training (e.g., Boritz and Carnaghan, 2017; Fan, 2017; Zaytseva, 2017) to increase individuals' capabilities. In this era, institutions of vocational education and training (VET) have emerged as transformational and flexible development environments; consequently, it is important to develop digital professional learning opportunities for vocational teachers who need to meet the requirements of their working lives. The competence-based approach relates to professional teacher training and professional development not only through identification and recognition of competences, but also through evolving pedagogical choices, digital learning solutions and evaluation processes. Educational institutions must innovate to meet the requirements of social and technological change while tackling economic challenges (Vähäsantanen, 2015).

Digital open badges are electronic microcredentials that can be used to identify and promote excellence and mastery (Abramovich, Schunn and Higashi 2013; Brauer and Ruhalahti, 2014). Open badges are used in learning to encourage students, to pinpoint progress and to support credentialing (McDaniel and Fanfarelli, 2016). In a competence-based approach, digital open badges are built to include detailed knowledge and expertise criteria as well as a description of the evidence (e.g., an online document). Still, one's first glance of a badge includes an identification image, graphic or icon, the name of the badge, issuer identification and other information content (Bowen, 2018; Brauer and Ruhalahti, 2014). Badges may be difficult to earn, but they adequately represent learning (Abramovich, 2016). Digital open badges offer to recognise "the expanded landscape of learning" (Grant, 2014, p. 5) and empower alternative ways of acquiring knowledge and skills (Devedžić and Jovanović, 2015; Knight and Casilli, 2012). Badges allow "learners to develop and maintain their learning portfolios throughout their lives" (Devedžić and Jovanović, 2015, p. 606), recognising excellence in diverse manners (Davies, Randall and West, 2015).

Previous research related to digital open badge-driven learning has focused on this initial process of digital badging, the essence of issuing and receiving badges (Hrastinski, Cleveland-Innes and Stenbom, 2018). The approach underscores the technical possibilities of badges as carriers of rich metadata (Newby, Wright, Besser and Beese, 2016), but the lack of pedagogical dimensions limit badges to becoming mere certificates or proof of participation (Abramovich *et al.*, 2013) at the expense of competence authentication. Developing technologies promote novel possibilities for education and training in diverse platforms and contexts. The idea of gamification is to use game elements and techniques in a non-game context, to motivate users towards desired behaviours and to improve their user experience (Nacke and Deterding, 2017); it seeks to arouse enthusiasm about online learning in a way similar to the excitement and enjoyment experienced while playing games (Deterding, 2012; 2015). However, the pedagogical methods and choices related to gamified badge-driven learning have not been studied extensively.

This doctoral thesis seeks to fill the research gap by providing a structure for digital open badge-driven learning in the continuing professional development of vocational pre- and in-service teachers. It

considers this gap in relation to different theoretical concepts linked to digital open badges, gamification, triggers of online learning and motivation. The thesis contributes to the current educational discourse on the competence-based approach, assessment and professional development. The thesis sets out to define the different qualities of digital open badge-driven learning and the overall structure of the learning process (such as procedures for motivational badging or scaffolding) in order to design competence-based approaches that can engage the full potential of digital badging.

Methodology

The investigated Learning Online professional development program (PDP) is a gamified, open badges-based MOOC (Massive Open Online Course). The MOOC aims to support teachers of vocational education and training (VET) in applying new technologies and strategies to teaching and learning in online, hybrid and face-to-face learning environments (Brauer, Siklander and Ruhalahti, 2017). The doctoral thesis provides insight into the differences and similarities of vocational teachers' experiences of digital open badge-driven learning. The research questions originate from the success of the Learning Online PDP and the previously discussed research gap. Each of the four sub-studies contribute to answering the study's overarching research question: how do digital open badges structure the gamified competence-based learning process in the continuing professional development of vocational pre- and in-service teachers?

The data were collected from Finnish pre- and in-service vocational teachers (n=29) in 2016 via group online interviews (n=6) and via online questionnaires in 2017 (n=329). The study draws on descriptive mixed research methodologies: qualitative content analysis, constrained correspondence analysis (CCA) and phenomenography. All of these approaches provide researchers with deep conceptual understandings and opportunities to draw new concepts and derive implications for novel educational practices. The doctoral thesis represents a bold and creative novel application of descriptive quantitative methodology in that it is the first study to apply constrained correspondence analysis (CCA) to the context of educational research.

Results

Different sub-studies highlight the research as a process and offer to deepen the existing knowledge of digital open badge-driven learning, complementing one another by explaining different aspects of the phenomenon. The aim of the first sub-study (Brauer, Siklander and Ruhalahti, 2017) was to reveal what motivates students in the badge-driven learning process. The study focused on mapping students' experiences of stimulating and supportive digital open badge-driven learning, ultimately determining motivational factors affecting the digital open badge-driven learning process. The findings present a multifaceted model of recognising competence and embracing gamified learning to encourage students' achievement orientation and intrinsic motivation.

In the second sub-study (Brauer, Korhonen and Siklander, 2019), the process was viewed from the perspective of guidance and scaffolding, asking how students experience scaffolding in badge-driven learning. The theoretical framework follows the concepts of the Five Stage Model of online scaffolding (Salmon, 2018) and instructional badging (Ahn, Pellicone and Butler, 2014; Gamrat, Bixler and Raish,

2016; Reid, Paster and Abramovich, 2015). The results indicate that a stage model of scaffolding and instructional badging holds value in structuring the badge-driven learning process.

The third study (Brauer, Ruhalahti and Hallikainen, 2018) aimed to identify students who were particularly motivated by digital open badge-driven learning. The research question sought to explore what triggers learning in the badge-driven process, with results indicating similarities and differences in experiences based on the achieved skill-set level and competence-development continuum for vocational teachers. The findings also suggest the value of applying gamification and digital badging in the professional development of both pre- and in-service teachers. The results propose digital open badge-driven learning triggered by flexible study options that include customising studies and learning new and up-to-date competences.

The final and fourth study (Brauer, Kettunen and Hallikainen, 2018) further describes vocational pre- and in-service teachers' experiences of the competence-based approach in digital open badge-driven learning. By explaining different aspects of the phenomenon, the study employed both constrained correspondence analysis and phenomenography to deepen our existing knowledge of digital open badge-driven learning. The results describe the impact of the competence-based approach on teachers' professional development during the digital open badge-driven learning process.

Each of the four sub-studies contribute to answering the study's overarching research question: how do digital open badges structure the gamified competence-based learning process in the continuing professional development of vocational pre- and in-service teachers? The primary results from the various sub-studies and theoretical approaches culminate in defining digital open badge-driven learning process grounded on the badge constellation of competences (Figure 1).

The entity of digital open badge-driven learning includes learning materials, badge criteria, 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.

As a conclusion, this doctoral thesis offers insights into the process structure and layered design for applying the competence-based approach, digital open badges and gamification in professional development. Further, the process approach embodies the ideal of study path customisation and personalisation in order to meet teachers' personal needs for their working lives. The practical contribution of the doctoral thesis research results suggest that we consider the cyclical model of design, which emphasises layers of theory (e.g. gamification, triggers of online learning or intrinsic/extrinsic motivation) as the basis for planning practical applications of digital open badge-driven learning. The design cycle (Brauer *et al.*, 2017, p. 20) illustrates the stages of the design process and theoretical cross-relationships and dynamics on a practical level and offer to facilitate the choice of theoretical approach at different stages in the design process.
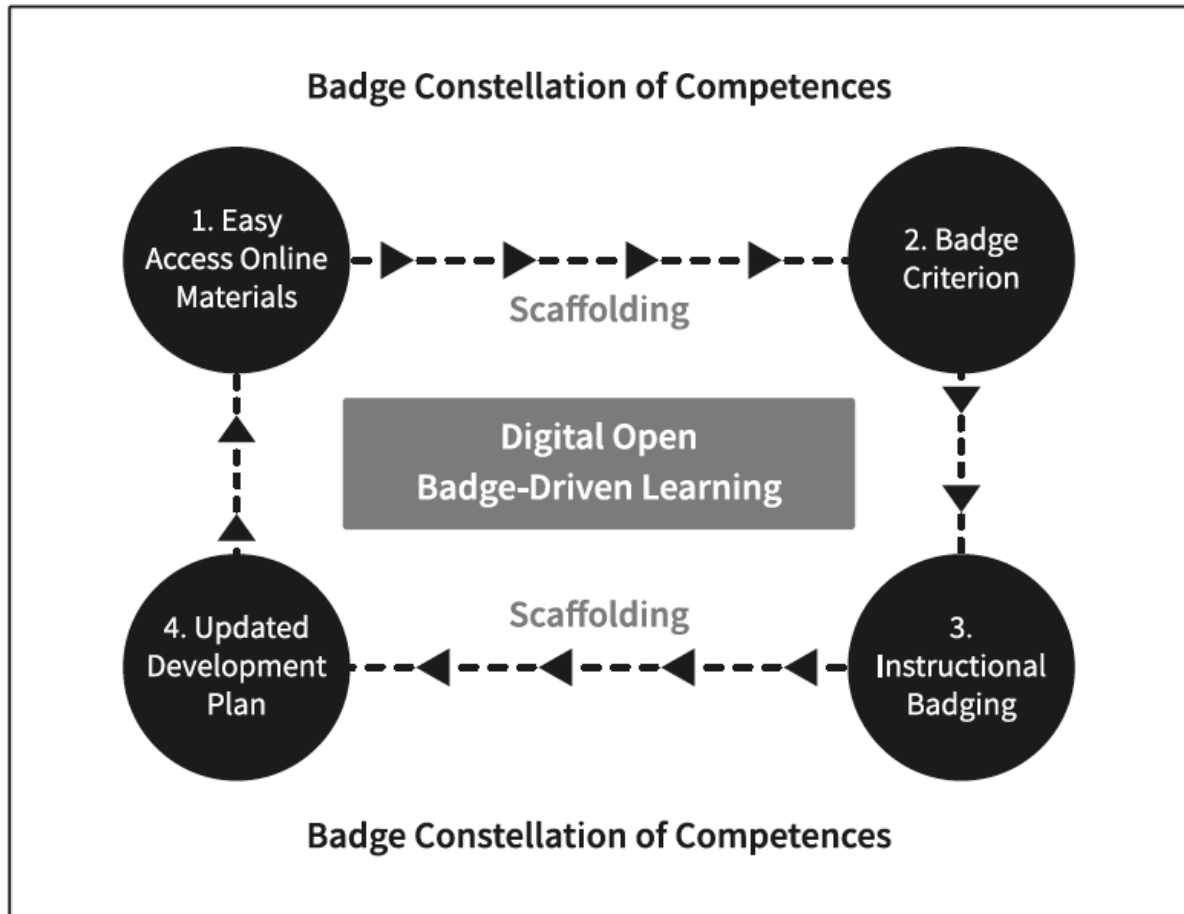
Figure 1. The identified structure for the gamified digital open badge-driven learning process (Brauer, 2019, p. 75).

Towards the Future

In the future, vocational teachers will become networked dual professionals in a dynamic, flexible and evolving coaching position (Andersson and Köpsén, 2015; Paaso and Korento, 2010; Ruhalahti and Kenttä, 2017; Ryymin, 2017). The challenges of the modern information society, constant changes in professional life and the developmental reform of competence-based vocational education and training will promote teachers to collaborate across different disciplines and educational institutions to generate shared expertise (Mäki *et al.*, 2015). Different learning opportunities will help teachers to structure a new kind of interaction culture, as a theoretical, practical and communal process.

Transforming assessment requires both design and development (Nichols, Kobrin, Lai and Koepfler, 2017). This doctoral thesis identifies open badge management platforms as new learning environments and suggests an application to design badge-driven learning. The work also draws heightened attention to digital badging and gamification in educational contexts. Digital open badges could substantially support the competence-development continuum of professional growth in the contexts of vocational teacher programs (Isacsson, Stigmar and Amhag, 2018), professional development and higher education.

In modern society, it is essential that teachers structure learning in a way that meets the requirements of digitalisation and the ongoing changes in the paradigm of continuing professional development (Kolls and Stoll, 2016; Redecker, 2017). Learning Online and the subsequent competence development programs provide teachers with an easily approachable and encouraging way of becoming acquainted with new online practices and digital pedagogical models to identify and recognise competences. Still, future designers should heed Lee *et al.* (2017) who remind us of the gradual expansion of new standards for grading while noting that shared challenges become shared expertise and finally best practices that can be shared with others.

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