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Teacher Professional Development in Education 4.0: The Role of ePortfolios and Open Badges

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ABSTRACT

ePortfolios and Open Badges support learners in taking responsibility for the learning process. When they choose ePortfolio tools by themselves, it supports a continuous learning perspective. Open Badges are used for the accreditation of competences that are demonstrated in ePortfolios. The concept of Open Badges is also used as a guiding and scaffolding tool in learning processes. Consequently, this is a case study in which ePortfolios and open badges were implemented in a professional learning and competence demonstration process with Vietnamese teachers in the EMVITET project. The project took three years, during which teachers learned to implement innovations in their pedagogy, technology and learning ecosystems in their teaching practices. Finally, the ePortfolios were assessed, and accreditations were given. The results of this case study show that teachers demonstrated their competences well in their ePortfolios. However, there are some areas of development in guiding and combining ePortfolios and Open Badges while supporting teachers' careers and continuous learning.

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1. Introduction

Open Badges and ePortfolios are part of the debate over Education 4.0 that emphasises, according to Hussin (2018), more independent learners, while teachers become better facilitators. Open Badges and ePortfolios support students in taking responsibility for their own learning processes. This aspect is a part of the concept of the personal learning environment (PLE), which includes students' personal views of their learning and competence development (Korhonen, 2020). It includes self-directed learning processes, for example via MOOCs (Massive Open Online Courses), various digital tools in learning processes and competence demonstrations in a digital format. The critical aspect is that students may choose their learning environments themselves. Accordingly, they do not need to stick only to educational institutions' digital and physical environments. Education 4.0 and the PLE concept pave the way for a blended learning setting when learning takes place anytime and anywhere and becomes a continuous, lifelong learning process (Laal & Laal, 2012; Finland's Ministry of Education and Culture, 2019). However, one of the main challenges is how to help students demonstrate their competences in a digital format. Open Badges and ePortfolios are harnessed to support students in this challenging task. In addition, teachers play an essential role in providing guidance and scaffolding. This article discusses how ePortfolios and Open Badges have been used with teacher participants in the EMVITET project to complete the approach of Education 4.0 in learning processes. The aim of this case study is to discover how to implement ePortfolios and Open Badges as a process in teachers' pedagogical, technological and learning ecosystem-related competences. The study also explores what kinds of Open Badges can be

defined as related to these very same competences and whether teachers value the Open Badges that they achieve.

ePortfolios are collections of artefacts in a digital format that introduce individuals' competences. ePortfolios may be a collection of texts, pictures, photos, videos and figures that make individuals' competences visible in a multifaceted way (Jewitt et al., 2016). Moreover, ePortfolio tools may be chosen by the persons, themselves. Alternatively, educational institutions can choose them and guide all their students to use the chosen digital platform. In educational settings, ePortfolios are often used as reflection tools in a learning diary format (Kankaanranta et al., 2007). However, ePortfolios should be seen as a wider concept than a learning diary (Korhonen, 2020). Learners' reflections and self-assessments might be very personal and sensitive; therefore, they are not shared openly. Barret (2010) used two faces of ePortfolio: a workspace and a showcase. In her concept, workspace ePortfolios create and save artefacts and other learning materials related to the learning process. Correspondingly, they are more repositories than a means of directly demonstrating one's competences to a wider audience. These repositories are needed when creating a showcase ePortfolio. The artefacts may remain the same in different stages of ePortfolios, or they can be edited to a more convenient format for various audiences. Typical audiences for a showcase ePortfolio are career advisors, employers, personal associations, family members, communities and portfolio owners, themselves (Cambridge, 2008). By presenting their skills in an ePortfolio, students can better see their professional development and their needs for future development, which also should follow their studies during their whole career (Korhonen et al., 2020). Moreover, ePortfolios can benefit teachers' continuous professional development.

Composing an ePortfolio is not an easy task for any student. Indeed, even teaching students find it hard even if it is also found to be a motivational, modern way to learn (Korhonen et al., 2020). Then, ePortfolios should be organised around competences (Rico, 2017), and all the use of the ePortfolio should be integrated with learning practices and curriculum design (Imhof & PIcard, 2009; Korhonen et al., 2020). In addition, ePortfolios promote continuous learning and are recommended for forecasting future studies. To see the purpose and working methods, learners require a great deal of scaffolding and guidance to successfully utilise ePortfolios (Korhonen, 2020).

Open Badges are so-called *microcredentials*, and they are a relatively new concept for identifying and promoting competences (Abramovich et al., 2013; Brauer & Ruhalahti, 2014). The Open Badge concept enables students or other Open Badge earners to collect badges into a personal repository and share them, for example via ePortfolios. Open Badges are information stored in a digital format that includes information such as the name of the competence, issuer of the badge, a description of the competence, assessment criteria and evidence of the badge earner's competence (Bowen, 2018). These are displayed to every audience that views the Open Badge. This means that everyone can recognise their competence again (Mozilla Open Badges, 2017). Open Badges are used to build personal learning paths by providing badge families and constellations that often inspire students to progress by following competence-based tasks (Brauer et al., 2018). Learning processes based on the Open Badge concept are also found to be tools for scaffolding students when Open Badges are used systematically during the entire learning process (Brauer, Korhonen & Siklander, 2019).

After the EMVITET project started, that is the context of the study (see Chapter Context), there have been several new studies established related to Open Badges and ePortfolios. The new studies clarify issues such as the relationship between Open Badges and ePortfolios. Brauer and Korhonen (2021) clarify questions, such as are ePortfolios for sharing open badges, or is a function of Open Badges to be ePortfolios? Moreover, do Open Badges identify and recognise competences that are presented in ePortfolios? The researchers reflected on open badges and the two faces of ePortfolios (Barret, 2010) introduced above. They concluded that the collection of Open Badges is a showcase ePortfolio that relates strongly to a workspace portfolio; however, the assessment of a showcase portfolio is conducted by Open Badges. The assessment is possible to be conducted by several assessors, such as peer

assessment, teacher assessment and expert assessment. In addition, a self-assessment was attached to the achieved Open Badge (Brauer & Korhonen, 2021). If comparing this to the ePortfolio assessment process, often it is a teacher who performs the assessment, and the assessment is not usually shown in an ePortfolio. The strength of the combination of ePortfolios and Open Badges lies in the multifaced assessing process, and an ePortfolio allows a person to show the most relevant materials of their competence. As Barret (2010, p. 10) says, "Why did I choose these pieces, what am I most proud to highlight about my work, and what does this work show about my learning?" In addition, Brauer and Korhonen (2021) provide a criteria-based assessment of competence with their model that replaces the summative assessment of learning. Open Badges offer criteria-based evidence that is always attached and based on an authentic competence demonstration.

Methodology

The aim of the article is to describe how ePortfolios and open badges are implemented as a process in the EMVITET project with Vietnamese participating teachers. The article reflects on how participants have succeeded in utilising ePortfolios and Open Badges in the project's learning activities to demonstrate and showcase their achievements. The approach is a case study that enables us to explore this phenomenon (Stake, 2000). The data are a word, images and videos that make participating teachers' competences visible in the subjects' ePortfolios. Subsequently, the ePortfolios are analysed with a qualitative research method (Johnson & Christensen, 2008) against the competence objectives that are defined and formulated as the open badges at the beginning of the project. The competence objectives, assessment criteria and instructions for competence demonstrations were formulated based on the previous literature and research. The aim of the research was also to discover what kind of Open Badge constellation can be formulated in the teachers' learning process related to a pedagogical and a technological competence, as well as related to a competence concerning learning ecosystems. The number of open badges issued was calculated. In addition, the amount of the not-received badges as well as accepted badges were calculated to discover how participants value the Open Badges they achieved. The aim was also to provide an engaging learning experience with ePortfolios and Open Badges for the participants and to support the use of innovative digital tools in developing Education 4.0.

The research questions were as follows:

1. How can ePortfolios and open badges be implemented as a process in teachers' learning process?
2. What kind of Open Badge constellations can be formulated for teachers' pedagogical, technological and learning ecosystem competences?
3. Do teachers achieve and value Open Badges during the competence development process?

Context of the Study

The participants of the present study were 39 Vietnamese teachers or managers in six Vietnamese educational institutions. The institutions involved were the Ho Chi Minh City University of Technology (HCMUTE), the University of Technology and Education – the University of Danang (UD-UTE), Lac Hong University (LHU), Hue Industrial College (HueIC), the College of Technology II (HVCT), and Ho Chi Minh City Industry and Trade College (HITC). Participants in these institutions were chosen by their managers. Participants worked at vocational and higher education levels, and 15 participants were a teacher or a lecturer. The rest of the participants were also working as teachers, but simultaneously were a dean or manager of the faculty. Additionally, 18 participants represented the faculties and departments of technical education, and the rest of the participants represented educational fields such as economics, languages, soft skills and chemicals and food technologies.

Empowering Vietnamese VET Teachers for Transformation towards Education 4.0 (EMVITET) is an Erasmus+ project led by HAMK University in Finland, with Dublin City University and Leuven University partnering to provide project technological and pedagogical solutions and support for six Vietnamese higher education and vocational institutions. The project commenced in January 2019 and

will run through 2022. EMVITET focuses on a collaborative knowledge-building culture between the project partners and the participants and aims to create a new learning ecosystem for Education 4.0 in Vietnam. This is based on student-centred learning, competence-based education, collaboration/networking in digital environments and sharing knowledge through a community of practice. The aim of the project was for participants to be able to do the following:

* Effectively use technology to enhance and transform teaching and learning practices
* Design and implement competence-based and student-centred learning
* Engage with communities within education and industry to create connections and support collaboration (Kunnari, Tien & Nguyen, 2019; Kunnari, Ngo & Hoang, 2021)

As previously referenced, ePortfolios have found a place in the literature as a rich and innovative form of assessment. Costelloe (2021) further suggests that there is great potential for ePortfolios to "support, document and evidence the wealth of non-accredited and in-/non-formal professional learning," as was the aim of the EMVITET project. In addition to collating and showcasing evidence of learning to project partners during this three-year project, ePortfolios were envisioned as a virtual space to display the open badges that would validate the achievement of the learning outcomes at each project stage.

Results

ePortfolios are woven throughout the fabric of the EMVITET project to support the learning and assessment processes of Vietnamese teachers, enabling participants to collect evidence of competences and reflect, assess and share knowledge with project members. To facilitate the ease of use of the ePortfolio platform for the teachers, a series of resources, workshops and support were developed. The first of these resources was an online eBook with instructional guides and video tutorials on the use of the ePortfolio. Workshops and face-to-face training for EMVITET participating teachers were also designed and run in Ho Chi Minh City at the initial project meeting. The ePortfolio platform, itself, was a customised version of Mahara, an open-source ePortfolio software.

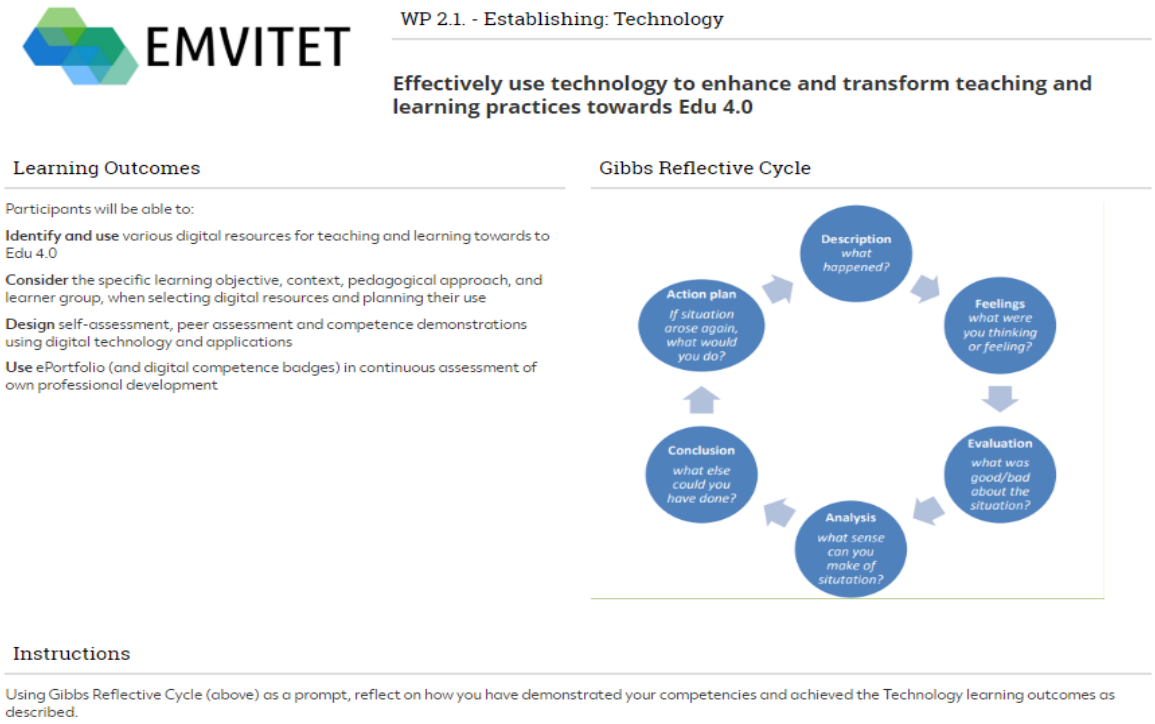

Figure 1. *The ePortfolio Template for the Technology in WP 2.1 Establishing Phase*

At assigned points at the end of each phase, completed ePortfolios were submitted to European facilitators for assessment. As each Vietnamese teacher's ePortfolio was private, this was done by submitting a secret link that provided access. The ePortfolios were reviewed against the learning outcomes, and if competencies were deemed to have been achieved, then an appropriate digital badge was awarded. The ePortfolios were composed with digital artefacts that combined text, figures, photos and videos.

The development of a constellation of digital badges was a key element of the EMVITET project plan. These were designed and accessible via the Open Badge Passport (https://openbadgepassport.com/). These were issued by HAMK University, and the criteria were created based on the learning outcomes for each stage and across each competence area. This resulted in nine badges being available for award to Vietnamese teachers. Subject to successfully meeting these criteria, the teachers could log into openbadgepassport.com and claim their badges. These badges were then displayed in the Mahara ePortfolio. To support this endeavour, which was new to the teachers, an instructional video was created to scaffold this process. Thus, the ePortfolio can be seen as the medium for reflecting on professional development during the process, as well as a vehicle for showcasing success through the display of badges.

Open Badges were used in the project to assess and verify the participants' competences. The project's competence objectives concern the concept of Education 4.0 and are divided into three main categories: 1) establishing, 2) piloting and 3) ingraining. The main categories are divided into three subcategories: a) pedagogy, b) technology and c) learning ecosystem. The assessment criteria for Open Badges are presented in Table 1.

The name of the Open Badge	**Competence objective**	**Assessment criteria**	**Instruction for competence demonstration**
Establish: Learning Design Pedagogy Edu 4.0	- recognize and reflect the new competence demands and soft skills needed in developing Edu 4.0 - describe key principles in competence-based and student-centred learning - reflect on the implications of key principles to their own teaching and assessment practices - analyse success factors in building students' engagement - design new ways of organize learning (Edu 4.0) in collaboration with teacher colleagues	Teacher participant is able: - to recognize and reflect the new competence demands in developing Edu 4.0 - to describe key principles in competence-based and student-centred learning - to reflect the implications of key principles to own teaching and assessment practices - to analyse success factors in building students' engagement - to design new ways of organize learning (Edu 4.0) in collaboration with teacher colleagues	Read carefully badge criteria and update your eportfolio according to them. Document your reflections and the evidence of your competencies. Assure that you have covered all criteria. Insert the web link (ePortfolio) of your evidence into the application form.
Establish: Technology in Edu 4.0	- identify and use various digital resources in teaching and learning for Edu 4.0	Teacher participant is able:	Read carefully evaluation criteria and update your

	- consider the specific learning objective, context, pedagogical approach, and learner group, when selecting digital resources and planning their use - design self-assessment, peer assessment and competence demonstrations using digital technology and applications - use eportfolio (and digital competence badges) in continuous assessment of own professional development	- to identify and use various digital resources to support teaching and learning for Edu 4.0 - to consider specific learning design guidelines, when selecting digital resources and planning their use - design self-assessment, peer assessment and competence demonstrations using digital technology and applications -to use eportfolio in continuous evaluation of own professional development	eportfolio reflection according to this. Document your competencies through your ePortfolio documentation. Assure that you have covered all criteria. Insert the web link (ePortfolio) of your evidence into the application form.
Establish: Learning ecosystems in Edu 4.0	- identify their own strengths in building learning ecosystems - identify and utilize dialogical principles in their own professional development and in team work with other participants - build a community of practice in their own school to support development - identify different ways to build industry – education collaboration and reflect their applicability in Vietnam	Teacher participant is able: - to identify own strengths in building learning ecosystems - to utilize dialogical principles in their own professional development and in team work with other participants - to build a learning community in their own school to support development identify different ways to build industry – education collaboration and reflect their applicability in Vietnam	Read carefully evaluation criteria and update your ePortfolio reflection according to this. Document your competencies through your ePortfolio documentation. Insert the web link (ePortfolio) of your evidence into the application form.
Pilot: Pedagogical practices in Edu 4.0	Teacher participant is able to: - organise inspiring learning and assessment practices related to future competences needed (integrating work-life) - facilitate students' central role in education - collaborate with their colleagues in designing and implementing Education 4.0 - apply soft skills development with students and teachers	Teacher participant: - organises learning and assessment practices related to future competences needed - facilitates student-centeredness - collaborates with colleagues when designing and implementing Edu 4.0 - applies soft skills development - reflects and develop own role as a facilitator of learning	Document your workshop or other learning and teaching activity related to future competences by videos, photos and/or text. Describe also your activities to implement soft skills in practical learning activities. In addition, describe how you have collaborated with your colleagues while designing the before mentioned learning activity/activities. Ensure that you also attach your own reflection about your role as a facilitator in the learning process. Share all the

	- reflect and develop their professional competence as a facilitator of learning		documentation via your ePortfolio and attach the link to your ePortfolio to the open badge application form
Pilot: Technology in Edu 4.0	Teacher participant is able to: - apply digital technologies to support learners' activeness and collaboration - build blended learning processes or/and online learning processes - utilize learning management system in students' guidance - apply digital technologies in engaging students and work-life representatives in ecosystem creation - use ePortfolio in continuous assessment of own professional development	Teacher participant: - applies digital technologies to support students activeness and collaboration - builds blended learning process or/and online learning process - utilizes LMS in student guidance - applies digital technologies in engaging students and working life - uses ePortfolio to reflect and assess own professional development	Document e.g. by links to LMS or other digital environments OR by screenshots how you have used digital tools in blended learning settings. You should, in addition, present how you have built students' guidance processes online. Attach also your own reflection about your professional development as an online teacher/facilitator. Share all the documentation via your ePortfolio and attach the link to your ePortfolio to the open badge application form.
Pilot: Learning Ecosystem in Edu 4.0	Teacher participant is able to: - be aware and sustain pedagogical well-being in communities with students and teacher colleagues - build new connections with the industry and/or society together with their students - create development projects to the needs of industry or regional society (integrating learning and development)	Teacher participant: - sustains pedagogical well-being in communities - builds new connections in the learning ecosystem - creates development project between school and industry	Document by videos, photos, figures and/or text your activities to sustain pedagogical well-being in learning communities. In addition, document how you have built connections in the industry or/and society that works in your own discipline, as well as what kind of development project you have created with them. Attach also your reflection about your competence as a teacher/facilitator in the development project. Share all the documentation via your ePortfolio and attach the link to your ePortfolio to the open badge application form.
Ingrain: Pedagogy in Edu 4.0	Teacher participant is able To demonstrate the ability to be a change agent for the development of innovative pedagogical practices, in collaboration with teachers and managers To understand the main principles of competence based curriculum	Teacher participant - works as a change agent for the development of pedagogical practices in collaboration with teachers and managers - applies competence - based curriculum principles in maintaining Education 4.0	Paste the link to your ePortfolio where you have stored the organisational guidelines and recommendations of Education 4.0 pedagogical practices and your text in your homegroup blog. Write your self-assessment and personal reflection related to the co-

	development and can apply these principles in maintaining Education 4.0 To co-create organizational guidelines and recommendations to support and maintain Education 4.0 pedagogical practices	- co-creates organisational guidelines and recommendations to support and maintain Education 4.0 pedagogical practices	creation process (e.g. how did you participate in the co-creation, how did you succeed, what did you learn). In addition, reflect your work as a change agent in the similar way. Finally, describe how you apply competence-based curriculum in maintaining Education 4.0.
Ingrain: Technology Edu 4.0	Teacher participant is able To influence and support colleagues to redesign online learning solutions To continuously explore the potential of new educational technologies to create new solutions in Edu 4.0 To build organizational guidelines for effective learning environments which support inclusive, accessible, and personalised learning.	Teacher participant - supports colleagues to build and redesign online learning solutions - builds and co-creates organzational guidelines for learning environments that support inclusive, accessible and personalised learning - explores new educational technologies for Education 4.0	Paste the link to your ePortfolio where you have stored the organisational guidelines and recommendations of Education 4.0 online solutions that support inclusive, accessible and personalised learning and your text in your homegroup blog. Write your self-assessment and personal reflection related to the co-creation process (e.g. how did you participate in the co-creation, how did you succeed, what did you learn). In addition, reflect how you explore new educational technologies for Education 4.0.
Ingrain: Learning Ecosystem in Edu 4.0	Teacher participant is able To sustain industry-education collaboration and adapt own actions based on raising needs To empower students to take the lead of their own learning and create organizational guidelines to support this To engage managers and teacher colleagues to craft their job towards open mindset and creativity for sustainable Learning ecosystems To co-create organizational guidelines and recommendations to support and maintain Education 4.0 learning ecosystems	Teacher participant - guides students to work in self-directed manner in learning processes - supports and helps coworkers (teachers, managers) to work creatively for sustainable learning ecosystems - co-creates organizational guidelines and recommendations to support and maintain Education 4.0 learning ecosystem	Paste the link to your ePortfolio where you have stored the organisational guidelines and recommendations of supporting and maintaining Education 4.0 learning ecosystems and your text in your homegroup blog. Write your self-assessment and personal reflection related to the co-creation process (e.g. how did you participate in the co-creation, how did you succeed, what did you learn). In addition, reflect on how you work as a supporter of your co-workers in order to help them work creatively for sustainable learning ecosystems.

Table 1. *The content of the Open Badges in the EMVITET project*

The participating teachers (N = 39) applied for the Open Badges and the number of their achieved badges was counted (Table 2). In total, 261 Open Badges were issued. When an Open Badge is issued,

the applicant receives an email message that instructs him or her to accept the badge and add it to the Open Badge Passport. This phase is voluntary, and all applicants may consider themselves if they want to accept the issued badge and add it to their passports. Out of all the badges issued, 82% were accepted and shared in the Open Badge Passport.

The meta badge includes all nine badges. It is issued automatically when all open badges are issued to an applicant. In total, 23 meta badges were issued, and 70% were accepted into the Open Badge Passport.

The name of the Open Badge	Badges issued	Not received	Badge accepted (into Passport)
Establish: Learning Design Pedagogy Edu 4.0	33	5	28
Establish: Technology in Edu 4.0	36	8	28
Establish: Learning Ecosystems in Edu 4.0	35	9	26
Pilot: Pedagogical Practices in Edu 4.0	27	6	21
Pilot: Technology in Edu 4.0	27	5	22
Pilot: Learning Ecosystem in Edu 4.0	27	6	21
Ingrain: Pedagogy in Edu 4.0	25	2	23
Ingrain: Technology Edu 4.0	26	2	24
Ingrain: Learning Ecosystem in Edu 4.0	25	3	22
Total	261	46 (18%)	215 (82%)
META BADGE	23	7 (30%)	16 (70%)

Table 2. *Issued Open Badges*

In addition, ePortfolios were studied to determine whether participants shared the Open Badges in their ePortfolios. This was also taught during the process. Eight teachers presented the earned Open Badges in their ePortfolios.

Discussion and Conclusion

In the context of the EMVITET capacity-building project, ePortfolios worked well in supporting the professional growth of Vietnamese participants. They made the learning outcomes visible and enabled the facilitation of teacher learning. The ePortfolios were composed in a multifaceted way, including text, photos, figures and photos. They included some reflections, as ePortfolios often do (Kankaanranta, 2007). However, ePortfolios are not just for reflection (Korhonen, 2000); participant teachers also shared their learning designs that include digital tools and pedagogical approaches. In addition, evidence of collaboration with the world of work and colleagues was described in detail in the conducted activities. The ePortfolios were a combination of a workspace and a showcase ePortfolio, as defined by Barret (2010).

The ePortfolio process followed the concept of the personal learning environment (Wheeler, 2015; Korhonen, 2020). The Mahara platform was introduced, and instructions for creating an ePortfolio were

given to the participants. Because a ready-made template and user account were given, most participants did not choose their ePortfolio tools by themselves. Mahara was established as an institution tool and was provided, ready for completion by the participants. However, a few participants made their own platform and created their ePortfolios, for example in Google Blogger or some other Google application. The concept of PLE was followed in that participants could keep their ePortfolios after the project and continue working with them if they wanted.

The Open Badge constellation created for three phases of the project (establish, pilot and ingrain) and three phases of the project phases (pedagogy, technology and learning ecosystem) is very wide. It is formulated by the frameworks of Bowen (2018) and Brauer et al. (2018), and clear competence objectives, assessment criteria and instructions for competence demonstration are written. However, it might be helpful to reconsider the number of Open Badges because the content and competence demonstrations combined several phases (pedagogical, technological and learning ecosystem). This means that one artefact makes several competences visible. The criteria and the constellation can be made a bit easier, which would help participants to understand how it is the most fruitful for demonstrating their competences. This is also a question for the audience: For whom are the ePortfolios and competence demonstrations made? As Cambridge (2008) says, the typical audience for an ePortfolio is career advisors, personal associations, communities and portfolio owners, themselves. The first three are looking for clear demonstrations of competences that give a vision of what an ePortfolio owner can do in practice and if the competence is relevant, for example, in their company's work tasks. The fourth audience, the portfolio owners, themselves, is looking for personal competence development – that is what is it and how to develop it further (Korhonen et al., 2020). This development process is for continuous learning, and an ePortfolio is a place to update development plans and constantly collect new evidence of competences.

The process with the Open Badges and Open Badge Factory was used as a tool for scaffolding and guiding participating teachers during their professional learning and competence demonstration process, as Brauer, Korhonen and Siklander (2019) have suggested. The ePortfolios were assessed by a team of EMVITET experts who facilitated the learning process. Open Badges were issued based on the criteria and the evidence the participants produced. Almost all issued badges are accepted into the earners' Open Badge Passport. However, only some participating teachers attached the earned badges to their ePortfolios. As Brauer and Korhonen (2022) suggest, it would be the accreditation of competence demonstration if the Open Badges were in the ePortfolio with the evidence. The reasons for not attaching the earned Open Badges to the ePortfolio might lie in the fact that, first, it was not guided enough as a possibility, and second, the participating teachers have not thought about how to use ePortfolio in the future and do not see the use of attaching the Open Badges into their ePortfolios. Third, when the Open Badges are in the Open Badge Passport, there is always a possibility of sharing badges or a collection of badges with various audiences and the competence demonstration (link to the ePortfolio) follows the badges. This might leave the impression that ePortfolios are not needed to show accreditations when Open Badges are used. Whatever the reason, it should be discussed and facilitated more regarding how to use Open Badges and ePortfolios so their full potential is harnessed in digital competence demonstrations and continuous learning purposes.

Farrell et al. (2021) posited that the pandemic has been a catalyst for ePortfolio practice. The EMVITET team had identified the ePortfolio as a holistic medium for recording and rewarding learning across the project before the pandemic. With interruptions to the project plan due to COVID-19, this proved a very valuable and timely approach that enabled learning to continue. Furthermore, the participants of the EMVITET project gained meaningful personal experience using ePortfolios and Open Badges as a tool for learning. One of the particularly rewarding impacts of the adoption of ePortfolios for participant teachers' learning is that a considerable number have embraced and integrated ePortfolio-based assessment with their own learners. This indicates that they saw the benefit of

ePortfolio practice in their own professional development, which was the overall goal of adopting this technology. Thanks to this experience, they are more confident in using them with their own students.

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