Case study Finland

Microcredentials for labour market education and training

First look at mapping microcredentials in European labour-market-related education, training and learning: take-up, characteristics and functions

By Sanna Brauer

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Table of contents

List of tables, figures, and boxes

Tables

Figures

Boxes

CHAPTER 1.   Introduction

Industrial revolution and the drive for global economic growth challenge educational sector and education legislators to rethink the structures, aims and tools of educational provision. The 21st century education seeks to meet both the societal demands of economic effectiveness and individuals' unique needs of professional development (Brauer, 2021). It has become increasingly important to develop trainings that meet the requirements of changing working life. Palsa (2021, p. 28) points out that competence-based approach 'is seen as better suited to the needs of contemporary (and future) working life than content-based education' (see also Gordon et al., 2009; Le Deist and Winterton, 2005). Sustainable forms of competence-based education and training are emphasized in the development of modern upskilling and reskilling options (Brauer, 2019a). Further, educational institutions must innovate to meet the requirements of social and technological change while tackling economic challenges (Vähäsantanen, 2015).

The recent movement towards competence-based curricula (UNESCO, 2019) and qualities of competence-based approach are emphasised in discussions in all educational sectors in Finland (Brauer, 2019a; Palsa, 2021; Rintala et al., 2018). European Union (EU, 2018a) promotes the provision of competence-oriented education, training and learning and references to the Bologna Process should be noted as well (Davies, 2017). However reasonable and simple the implementation of new policies seems, the revision of existing practices is not an easy achievement (McGrath and Lugg, 2012). A clear articulation of competences is needed to reform educational provision to meet students' individual interests and recognised working life needs (Brauer, 2021). Despite the years of extensive effort towards shared policies, both language and practices of competence-based approach appear discipline and organisation specific (Davies, 2017; Ipperciel and ElAtia, 2014; Jerez et al., 2016; Ushatikova et al., 2016). Thus, for example, a recent study by Palsa (2021) should be noted, as it represents the concept of competence-based curricular contextualisation transcending the different curricular areas, such as pedagogical practices and disciplinary contents.

1.1.   The extensive reform updates the vocational education and training in Finland

The Finnish government embarked on a reform of entire VET in 2015. The main aims of the change were to adopt a new customer-oriented and demand-driven approach to educational provision and to meet the needs of the world of work

(Kukkonen and Raudasoja, 2018; Ministry of Education and Culture, MINEDU, 2018; Rintala et al., 2018; Räisänen and Goman, 2017). The notable change in legislation came into force in January 2018. It led to changes in the steering and regulation system and introduced a new funding model focused on qualifications and employment to improve the effectiveness of VET (MINEDU, 2018; Rintala et al., 2018). The new model emphasising individual learning paths has transformed teachership, use of learning environments and resulted to more self-directed learning (Rintala et al., 2018). In Finland, the reform in VET has led the way towards the evident change in all educational sectors.

Common practices are still on demand. Several key issues and drivers such as numerical indicators, experiments, and cross-country policy learning steer educational reforms (McGrath and Lugg, 2012). The current approaches in Finland offer to support a digital learning ecosystem based on life event thinking and the development of technological solutions with respect to customer-centered services (Virolainen et al., 2019). However, the change is required also on a policy and management level; national and European guidelines are expected and respected.

1.2.   The Finnish reform of continuous learning

In Finland, we believe that competence secures the future. Finnish Government (2020) has set parliamentary policy for reforming continuous learning to meet the needs of the transformation of work, technological advances, and global change. Educational institutions are encouraged to rethink approaches to learning and teaching and to modernise educational provision (EU, 2017). Continuous learning should be seen as a strategic part of the activities of organisations (Finnish Government, 2020). Moreover, educational reforms involve seeking sustainable alternatives to the traditional and expensive realisation of degree programmes through options like the competence-based approach (Brauer, 2019a). This is in line with European Union promoting the provision of competence-oriented education, training, and learning, establishing related good practices and better support of educational staff (EU, 2018a).

The Finnish parliamentary group aims to identify ways and measures that will help ensure that the development of competence becomes a natural part of work or entrepreneurship for more and more people (Finnish Government, 2020). Everyone's strengths and competence should be identified. The Finnish service system for continuous learning will be reformed led by the government. Key measures include increasing the provision of education that takes into account different life situations as well as the needs of the world of work, simultaneously strengthening the structures of the bond between work and competence. The

digital solutions to be introduced by 2023 will form the framework and platform for the Finnish services in continuous learning. Guidance is provided to reach different target groups at work and outside work. Continuous learning should be considered as a strategic tool and viable actions for organisations. 'Focusing on continuous learning is the best safeguard in the midst of the transformation of work, technological advances and global change' (Finnish Government, 2020, p. 5). Microcredentials play an essential role on this development both as a tool for lifelong learning but also as a tool for credit transferability.

CHAPTER 2. Analysis of the take up, characteristics and functions of microcredentials

2.1. Presentation of the methodology

The interest towards research on microcredentials is continuously growing, however, the integration of digital credentials in teaching and learning is still a somewhat unexplored area of study. Upon completion of this study, the first extensive scientific compilations of alternative credentials will be available (e.g. Piedra, 2022). In this qualitative review, we were interested in the structures of education administration that underpin pedagogical development and especially the practical implications regarding the use of microcredentials in education. The data of the literature review consisted of national and international scientific studies, national monitoring reports, recommendations and guidelines, and microcredentials task force working papers on progress. Relevant laws, regulations, and administrative procedures that may affect the interpretation of previous were also examined. Various sources prepared by international and national stakeholders were consulted throughout the study.

In addition to desk research, a set of interviews were conducted based on the general interview questionnaire provided by PPMI. The main data of the study were collected from 40 Finnish informants in 2021 via group online interviews, online interviews, and email conversations. Please see Annex 1 for detailed information. Researcher's wide networks were employed to identify the most appropriate and knowledgeable data providers and to stablish a means of communication (e.g. contact person). The conducted 13 interviews provided over 15 hours of data for inductive analysis. The data were coded without trying to fit it into a preexisting coding frame or the researcher's analytic preconceptions. The main coding categories were formed using the inductive approach (Boyatzis, 1998) in a data-driven manner. Mapping was used as a tool to represent elements of individual and group thinking at a particular time regarding the given research questions. These results also helped to ground the entirety of the related theoretical concepts.

As the group of Finnish respondents in the international Microcredential Survey was small (n = 5), no conclusions can be drawn from the results, but they nevertheless describe diversity and interest in microcredentials. These results were used to supplement other qualitative data collected in the study.

2.2. How familiar are the stakeholders with the term of microcredentials?

Different types of microcredentials have been introduced within the developmental efforts related to the Finnish reforms of VET (MINEDU, 2018) and the continuous learning (e.g. Brauer, 2019a; 2020; Korhonen, 2020; MINEDU, 2020; Oosi et al., 2020). In the context of Finnish VET, prevailing argumentation suggest considering 'microcredentials as smaller fractions of competence sets' (National Agency for Education, EDUFI, 2020). Skill shortages in the Finnish labour market are increasingly apparent and there are growing concerns about the supply of higher-level skills, given demographic change, and stagnating educational attainment levels (The Organisation for Economic Co-operation and Development, OECD, 2020a). The OECD's recent report (2020a) assesses the current system of continuous learning in working life in Finland, indicating some gaps in learning provision, including limited upskilling opportunities for adults with vocational qualifications and, more generally, limited availability of short courses relevant to the labour market. Microcredentials are currently promoted as the means to explore the introduction of short-cycle tertiary education (EDUFI, 2020; OECD, 2020a). However, the awareness of the concept varies between contexts and practitioners.

In accordance with the general European linguistic confusion of the competence-oriented terminology (Brauer, 2021; Davies, 2017), adds the Finnish language itself a couple of levels on the 'microcredential' challenge. For instance, the actual term microcredential is significantly less known in Finland than the concept of digital open badges with similar characters focusing on the actual learning outcomes. Also, digital open badges have been referenced as microcredentials based on previous international studies (e.g. Abramovich et al., 2013; Davies et al., 2015). The Finnish interpretation of a digital open badge aligns with determinations from international research e.g. Gibson et al. (2013) representing a badge as 'a representation of an accomplishment, interest or affiliation that is visual, available online, and contains metadata including links that help explain the context, meaning, process and result of an activity' (p. 2). Institutionally awarded badges are 'electronic microcredentials' that can be used to identify and promote excellence and mastery (Abramovich et al., 2013). Families of connected badges form a badge constellation built from stacks or layers (Brauer et al., 2017). Further, digital badging is a form of competence-based assessment that offers recognition of formal, informal, and experiential learning (Brauer, 2019a).

Digital open badges have been employed in learning for a decade in Finland (Brauer, 2019a). Badges have been the prominent tool to test and develop

competence-based approach in learning and assessment on digital settings focused on achievement as smaller fractions. After ten years of extensive development, Finnish educational professionals seem quite familiar with the vocabulary related to digital open badges. For example, the Finnish word 'osaamismerkki' means 'competence-based digital open badge representing an acquired competence with a proof of evidence'. There is also a specific word 'osallistumismerkki', for a badge of participation which is also quite well known among educational developers. However, when open badges are employed as diplomas, certificates or for some other purpose, people are not quite confident, how these incentives should be valued or validated.

To sum up the confusion, the term 'microcredential' itself has remained vague in Finnish research and applied solutions. Thus, microcredentialing is quite recent as a stand-alone concept on national debates and in Finland it currently connects to the discussions of the national reform of continuous learning.

2.3. How are microcredentials defined by different stakeholders?

There are both consistent and conflicting interpretations for both digital open badges and microcredentials that require profound and transparent development to build systems and practices of high quality. The scoping review of current discourses allow categorising into four main streams as following:
(a) microcredentials as short-cycle education and training;
(b) microcredentials as smaller fractions of competence;
(c) microcredentials as credits in a digital format;
(d) digital open badges as microcredentials for learning and recognition.

Underneath each of these four streams, there are still a number of refinements and attributes related to the content of a specific microcredential. This illustrates the linguistic confusion that is more broadly related to competence-based approach (Brauer, 2021; Davies, 2017). Although Finns are among the first to employ digital open badges as national constellations and possess a solid knowledge of competence-based education and training in VET, the concept of microcredential remains vague and the discussion of the exact definition(s) is ongoing.

2.4. Are microcredentials or similar credentials referred to in policy discussions and strategic documents? What are the main activities related to microcredentials that are taking place in different contexts? What are the recent developments related to microcredentials?

EDUFI (2020) and MINEDU (2021) have opened discussions of microcredentials as the means to explore the introduction of short-cycle education and training (see also OECD, 2020a). The ongoing debate of microcredentials as smaller fractions of competence also examines options to restructure degree programmes into smaller entities in terms of continuous learning. In a larger scale these approaches relate to the educational reforms (Finnish Government, 2020; MINEDU, 2018; 2020; Rintala et al., 2018) and offer to support a digital learning ecosystem based on life event thinking and the development of technological solutions with respect to customer-centred services (Virolainen et al., 2019). The recent national initiative is also seeking for determination for microcredentials (MINEDU, 2021).

2.4.1. Microcredentials as smaller fractions of competence

In Finland, microcredentials are seen useful in continuous learning and recognition of competence, promoting diverse training provision and better employment. The Ministry of Education invited a task force meeting in March 2021 based on the final report of higher education consultation group (Andersen et al., 2020) and initial meetings held in the fall of 2020. The main challenge set for the working process was to build shared understanding of what microcredentialing means in terms of short-cycle education and training, and as smaller fractions of competence in the context of Finnish reform of continuous learning (Finnish Government, 2020). The task force notes (Finnish Government, 2021a) raise the following questions into discussion:

(a) are short-cycle courses something new that should be promoted in education and training?

(b) what is needed that those smaller fractions of competence could support the visibility of workplace learning?

(c) how smaller fractions inform and improve lifelong learning and achieved competences?

The concept is seen as complementary and structuring the current educational provision. Separate units of vocational qualifications and open higher education are presented as good examples of smaller fractions of competences already available in Finnish educational system.

Discussion notes (Finnish Government, 2021a) suggest considering various
aspects in the development of microcredentials:

(a) the advantages and benefits of smaller fractions of competence
(microcredentials) both in career development and as part of degree training;

(b) the relationship between short-cycle education and training, and the current
education system. Optional ways and concepts for competence development,
e.g. is the link to the national competence and qualifications frameworks
compulsory or important?;

(c) national metadata model incl. learning objectives, level, scope and
connection/connectivity of the studies allowing also the recognition of informal
learning at working life;

(d) frameworks for sharing educational models and practices; cross-sectoral
educational planning and implementation of trainings;

(e) on-the-job studies and workplace learning should be included in the definition;

(f) the definition should clearly indicate whether a microcredential always refers
to some formal education or course, or whether it can also represent criteria-
based digital open badges granted based on demonstration of a competence;

(g) eligibility of entities providing microcredentials and whether competence
development services by private providers should be included;

(h) connectivity of the digital platform(s) used for the short-cycle education and
training provision; development and options for integration to maximise the
impact of microcredentials.

In addition to the summary above, also options to individual and flexible study
paths, regional and local customisation, adequacy of training provision, my data
thinking, development, and automation of validation of prior learning (VPL)
processes were considered essential features for the service design. The aim is to
develop national and international cooperation, and to provide simple and easy-
access services to individuals. However, comprehensive standardisation and the
consequent fragmentation of content were seen as possible risks as well. Similarly,
legal protection of the educational service providers was a recognised concern.
National development would support the quality of the content of microcredentials
as well as the development of the strong digital information infrastructure required
for them. (Finnish Government, 2021a.)

2.4.2.   Microcredentials as actual digital credits

In competence-based approach, the focus moves from the educational provision,
course contents' and teaching activities' 'input' to the actual 'output': mastering of
a specific competence (Palsa, 2021). Thus, it is natural to consider

microcredentials also in terms of learning outcomes, required evidence and assessment of competence (Andersen et al., 2020). The Finnish microcredential task force (Finnish Government, 2021a) suggests a nationwide system and a model for identifying competence as key prerequisites for a unified digital toolkit and a data repository that allows technical transferability of diplomas and certificates and fractions of those. The learning management systems (LMS) and learning record stores (LRS) list the competences and course performance validated by the educational institution, but do not reflect on the actual competence of an individual. Moreover, it is essential to distinguish accumulated competence from formal competence (Finnish Government, 2021a).

The interviewees of this study acknowledged that digital information systems are here to stay and with the pandemic they have been developed to be more functional. Currently, Studyinfo.fi is the official and up-to-date website with all the information about study programmes leading to a degree in Finland. Service portal provides information on different degrees, qualifications, and studies Finland. eCurriculum section of the portal contains education and qualification eRequirements from early childhood to secondary level education and training, and liberal adult education. The Studyinfo service can be used to find different study options and apply for the studies online. The Studyinfo portal is maintained by EDUFI. Finnish educational institutions maintain their own study programme information on Studyinfo. 'My Studyinfo' site allows to view your own study admission process, study information and also completed studies (Figure 1).

Figure 1. Screenshot from My Studyinfo

Source: https://opintopolku.fi/oma-opintopolku/
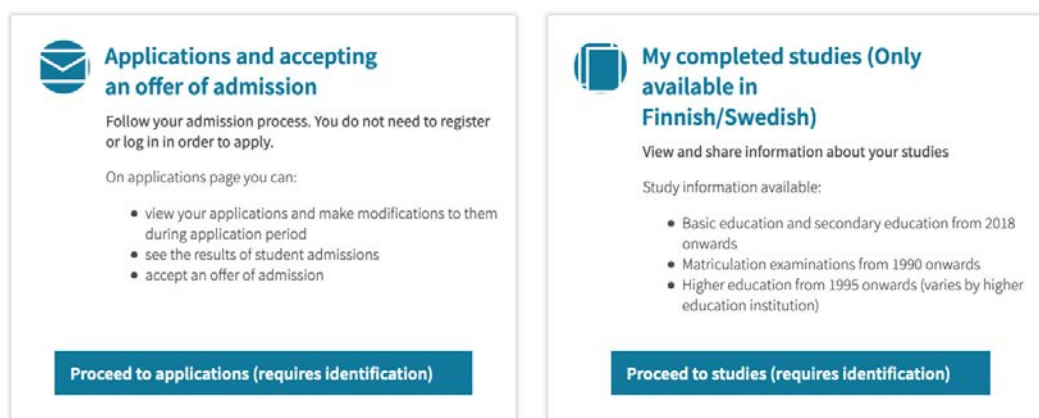
Authentication is secured by Finnish bank identification codes, mobile certificate or certificate card. Studyinfo contains also nationwide study and degree data (the Koski database) on basic education, secondary education and higher education. The Koski database also contains information on right to study and the main contents and competence requirements of completed degrees. The structure supports the so-called 'transfer service' that allows to combine and transfer data from different sources and registers such as matriculation examination. The interviewees regretted that the current data model of the Koski system does not allow, for example, the description data of the competence demonstrations included in a vocational qualification. Moreover, citizens can only browse their own data, not modify or share the content. However, information is accessible for authorities who need it in their operations, such as education providers, municipalities, Kela (the Social Insurance Institution of Finland) and employment and economic development offices. The data is also continuously utilised in various evaluation and monitoring studies. The Finnish microcredential task force (Finnish Government, 2021a) has acknowledged these tools fundamental in the national service structure, but also set a requirement to develop additional portfolio tools for updatable competence profiles. Task force reminds that service development should be based on experience gained in various projects to enable various interfaces and interoperability between digital solutions of the platform. They also note that the portal should support VPL processes. The interviewees of this study emphasised that centrally managed systems such as Europass or Koski-service should not determine the concept of microcredential. Instead, a microcredential should be a criteria-based (not measured by time) competence description represented in a format that allows my data thinking [1] to empower individuals by improving their right to self-determination regarding their personal data**.**

2.4.3. Digital open badges as microcredentials for learning and recognition

Different formats of competence descriptions should be considered viable tools to support both the transition to the world of work and career-long competence development (Brauer and Korhonen, 2021). Digital open badges have been prominent in Finland as an approach to microcredentialing in assessment for years (Brauer, 2020b). VET institutions and schools of professional teacher education have been the key actors in the development of new and innovative approaches to motivational learning driven by digital open badges. The most important incentive for of the development has been competence-based approach and new tools for criteria-based assessment (Brauer, 2019a). Moreover, badges offer to

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(1) For more information see: https://mydata.org/

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 (Brauer, 2019a; 2019b; Brauer et al., 2017). Badge development efforts have been for example:

(a) sole teacher driven pilots for course improvement;

(b) department level advancement on digital pedagogical practices;

(c) discipline specific projects piloting new tools and approaches (CORE, 2021; Learning Online, 2021);

(d) and national network initiatives (Chips for Game Skills, 2021; Competitive Skills, 2021; Guild Schools, 2021; Teachers' Open Badges, 2021).

Another important driver for of the development of open badge constellations has been the growing demand for economically effective accreditation practices that respond individually to local challenges and unique professional needs (Brauer, 2019a; 2020a; Chips for Game Skills, 2021). Digital open badges offer a tool to the verification of prior learning by identifying and recognising competences acquired outside the formal education system, at different levels of education, and in transition phases of the education structure (Brauer, 2020b; Competitive Skills, 2021). Professional teacher trainers are in charge of the pre- and in-service training of vocational teachers. They have been the first to serve the educational reform and to see the effects of digitalisation on different disciplines (Brauer, 2019). Similarly, Schools of Professional Teacher Education have been among the first to explore the potential of digital open badges (Brauer, 2019a; Korhonen, 2020; Learning Online, 2021; Teachers' Open Badges, 2021). It is essential to support changes to VET instructors' competences after the reform in the vocational education and training sector in Finland (Korhonen et al., 2020). The standards and guidelines require development on a both national and European level (Kullaslahti et al., 2019).

2.4.4. The ongoing determination of the concept of microcredentials

The previous notions allow a summary of the current situation in Finland indicating that the concept needs to be clarified further. Finnish Government does not yet provide educational sector with finalised documentation (strategies or national guidelines) regarding microcredentials. The microcredential task force has just been invited by The Ministry of Education in March 2021 based on the final report of higher education consultation group (Andersen et al., 2020) and initial meetings held in the fall of 2020 by EDUFI. Two main approaches are emphasised in the development efforts:

(a) short-cycle education and training provision (EDUFI, 2020);

(b) development of technical infrastructure to create diplomas and certificates (Finnish Government, 2021a).

This dual approach was a repetitive pattern in the interviews, and the informants were consistent informing that 'the coin has two sides and both of these are required to succeed'. Finnish national authorities emphasise the concept of microcredentials as a tool to develop short-term education and training. Simultaneously educational institutions are quite confident with the formulation of the educational provision but seek for stronger cooperation with businesses and different industries. The preliminary results of a current study by The Finnish Education Evaluation Centre (FINEEC, 2021) draw a similar picture. New tools are on demand to communicate both existing and desired competence better with different stakeholders of personal career paths or staff enrichment. The interviewees of this study agreed that collaboration has been promoted in Finland for a long time already. Results are tangible as e.g. vocational qualification structure currently allows competence development based on smaller units of qualification requirements and criteria-based assessment has also been developed through new digital tools such as open badges. VET providers emphasise that when there is a lot of choice and different options, it is important to gather the competence information in one 'passport' instead of a bundle of certificates.

Badges offer to promote information on how and why competences should be developed and validated. In Finland national badge constellations are built to meet requirements of different frameworks such as DigComp (The European Digital Competence Framework) or National qualifications frameworks (NQFs), that classify qualifications by level, based on learning outcomes (see e.g. Competitive Skills, 2021). In addition to various frameworks supporting accreditation, the most important factor contributing to validation is still the detailed badge criterion and option to attach evidence as documentation that allows clear interpretation of a competence in question in different contexts (Brauer and Korhonen, 2021). The interviewees saw even the digital open badge itself as an evidence, a proof of competence. This is in line with the New Skills Agenda for Europe inviting '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, 2018a, p. 2).

As a conclusion, this report will continue to examine these issues in more depth through two main research questions:

(a) RQ1: how microcredentials support the development of short-cycle education and training?

(b) RQ 2: how microcredentials inform and promote the actual learning outcomes of short-cycle education and training?

The aim is to characterise different aspects of microcredentials in the context of Finnish VET, both in career development and as part of degree training.

2.5. What is the extent to which microcredentials are used in the labour market related education, training and learning?

Continuing education in Finland encompasses many different forms of learning and study - everything from university courses and specialist training for training companies to conferences and trade fairs. Continuing education is a general term for various courses aimed at increasing and supplementing individual competence. The term often refers to in-service training. Microcredentialing is a sufficiently new tool to structure short-term educational provision. Microcredentials are viewed as flexible, less-time-consuming, up-to-date and affordable short courses addressing some coherent set of competences. The idea resonates to the European Association of Institutions in Higher Education, Eurashe, statement of microcredentials in professional higher education (2021).

2.5.1. Microcredentials as short-cycle education and training

The prominent definition in Finland suggests viewing microcredentials as the means to explore the introduction of short-cycle tertiary education (EDUFI, 2020; OECD, 2020a). The interviewees highlighted two particularly good examples of short-term education and training:
(a) smaller units of qualification requirements in VET;
(b) open University and Open Universities of Applied Sciences.

These studies are available in daytime, evenings, weekends and on the web at most educational institutions across Finland. Variety options allow personal choices to collect individual study units or accomplish bigger study modules. Continuing education is not compulsory, although in some areas there are qualifications that are required to be completed and need to be updated from time to time.

Proceedings in short-cycle education and training are already well established for some implementations; others are still under development. The volumes in education and training vary, and it is not easy to describe the results in a simple way, with a single meter.

2.6. Who are the main actors providing learning activities leading to microcredentials and issuing microcredentials?

In Finland, education providers such as municipal education and training consortiums may provide education and training consisting of smaller fractions than the vocational qualification units based on its permit to organise vocational education and training (Vocational Education and Training Act) and use the governmental financing received for it. The possibility to complete only part of the qualification (vocational units or smaller fractions of units) is intended to promote employment and improve individuals' employability. Working in many of sectors also requires certain qualifications, cards or permits such as First aid skills, Occupational Safety Card or Hygiene Passport. Card training and related tests required for working life are provided by both government-funded educational institutions and private service providers.

Open Universities and Open Universities of Applied Sciences (Open UAS) promote educational equality and lifelong learning. UASs in Finland are active developers of professional higher education (PHE). UAS specialisation studies offer post-graduate courses designed to promote professional development for those already in employment, with the aim of producing competence in areas of expertise that do not have a market-based training offer. Open UAS' are recognised operators in the field of short-term training providing studies consisting of UAS' degree programme provision. Entire degrees cannot be completed at the open UAS. Open UAS offers both bachelor's and master's degree studies. Education is open to everyone interested, regardless of age or previous education.

2.6.1. Vocational education and training in Finland

A vocational qualification provides good capabilities for working life. Vocational studies in Finland can either lead to a qualification or be in the form of further education or continuing education needed in different career stages. Vocational qualifications include vocational upper secondary qualifications, further vocational qualifications, and specialist vocational qualifications. Education not leading to a qualification includes preparatory education for vocational training (VALMA) and preparatory education for work and independent living (TELMA). Vocational qualifications are offered in Finnish and Swedish in eight different educational fields. VET is organised in institutions (on-the-job learning included) and as apprenticeship training both arranged as competence-based qualifications. Vocational qualifications provide eligibility for higher education studies. The Ministry of Education and Culture prepares VET legislation and steers and

supervises the sector. The Ministry also grants the education providers' permits to provide VET. VET is developed, delivered and assessed in close cooperation with the world of work. (MINEDU, 2021c; Studyinfo, 2021)

Qualifications are the same for young people and adults. Vocational qualifications are independent of the way the vocational skills have been acquired. Students demonstrate their skills in competence demonstrations at practical work. A personal competence development plan is drawn up for each student. The plan is drawn up by a teacher or a guidance counsellor together with the student and, when applicable, representative of working life. The plan charts and recognises the skills previously acquired by the student and outlines what kind of competences the student needs and how they will be acquired in different learning environments. Students may have obtained relevant skills from working life, another school, international study, work placement periods, family and leisure activities or through the media. Previous learning is recognised and only the missing skills are acquired. The plan also includes information on the necessary supportive measures. (MINEDU, 2021c)

2.6.2. Short-cycle vocational education and training

Finnish VET allows students to advance or supplement their vocational skills without having to aim at completing a qualification or its part. These aims and contents of so-called 'other VET' are tailored to the needs of workplaces or individuals. The composition of vocational qualification and qualifications requirements in Finland is based on unit structure. Vocational units are either compulsory or optional. Students can complete entire qualifications, parts of them or smaller units, or combine parts of different qualifications based on their needs. Competence requirements are the same in all learning environments, also in workplaces. (MINEDU, 2021c)

In terms of microcredentialing, this unit structure allows provision of short-cycle tertiary education based on all eight educational fields. Here is an example of the structure and a potential unit to provide as a microcredential. Interviewees from education administration suggested that microcredentials should be modular by structure and the actual credential should be granted only from larger entities as described below. This example (Box 1) illustrates a vocational unit that is comprehensive enough to employ a person without completing the entire degree.

Box 1. Example of vocational qualification in Horticulture

Competence requirements (30 competence points)

Carrying out work in a horticultural store. The student knows how to:
(a) plan their own work, taking into account the following work stage, employees and the order of priority of the tasks (5119);
(b) take care of the cleanliness, tidiness and safety of the shop and the work area (5118);
(c) take care of marking the prices and price the products according to the instructions given to them (5117);
(d) as a member of the work team, build a sales-oriented display for a product or product group, applying the basic principles of building a sales-oriented display (5116);
(e) maintain the display and tend to the living material (5115);
(f) assess the functionality, maintainability and adaptability of shop design and product presentation (5114);
(g) assess the importance of shop design and product presentation for the smoothness of the sales situation, additional sales and the creation of the product, brand or store image (5113);
(h) produce information material to support sales (5112);
(i) minimise the generation of waste and sort and recycle waste material, promoting the circular economy (5111).

Caring for products in a horticultural store. The student knows how to:
(a) identify the plants sold in the shop, knowing their Finnish names, scientific families and species (5110);
(b) tend to living material and keep it in saleable condition, applying the care requirements specific to each plant species (5109);
(c) store and place for sale products from the product groups sold in horticultural stores, ensuring that they are in saleable condition (5108);
(d) receive and check goods deliveries and report incorrect deliveries (5107);
(e) detect and prevent the spread of plant diseases, pests and invasive alien species carried by the products on sale (5106);
(f) avoid waste (5105).

Preparing products for sale. The student knows how to:
(a) prepare plants and other products for sale (5104);
(b) tie bouquets and make flower arrangements (5103);
(c) make plant arrangements (5102);
(d) use material appropriately and avoiding waste (5101);
(e) price products and calculate the share of VAT (5100).

Source: Carrying out work in a horticultural store
https://eperusteet.opintopolku.fi/#/en/esitys/6942140/reformi/tutkinnonosat/6958210

The student demonstrates their competence in practical tasks in a horticultural store by carrying out the daily work tasks performed in floristry or horticultural business. Table 1. below explains the assessment criteria in detail:

Table 1. Assessment criteria

Satisfactory 1	• carry out a set of tasks following instructions; • work cooperatively; • need additional instructions in some situations; • draw on the underpinning knowledge required in a set of tasks; • modify their actions based on the feedback they receive.
Satisfactory 2	• carry out a set of tasks with initiative and following instructions; • work cooperatively and interactively; • rarely need additional instructions; • use the knowledge needed in their set of tasks appropriately; • modify their actions based on the feedback they receive and their personal observations.
Good 3	• carry out a work process independently; • work cooperatively and show initiative in interactive situations; • cope with ordinary problem-solving situations; • draw diversely on the knowledge required in their set of tasks; • assess their performance realistically.
Good 4	• plan and carry out a work process independently; • work cooperatively and constructively in interactive situations; • manage problem-solving situations, drawing on diverse methods; • apply the knowledge required in their set of tasks diversely and with justifications; • assess their performance realistically and recognise their strengths and development areas.
Excellent 5	• plan and carry out a work process independently, taking other actors into consideration; • work cooperatively and constructively, also in challenging interactive situations; • apply the knowledge required in their set of tasks to problem-solving situations diversely and critically; • make justified development proposals related to their set of tasks and operating environment; • assess their performance realistically and suggest justified solutions for developing their competence; • understand the importance of their work as part of a larger process.

Source: Carrying out work in a horticultural store
https://eperusteet.opintopolku.fi/#/en/esitys/6942140/reformi/tutkinnonosat/6958210

To the extent that the competence required in the unit cannot be assessed on the basis of the demonstration, the competence demonstration is to be supplemented in other ways on an individual basis.

2.6.3. Financing of Vocational Education and Training

MINEDU is responsible for the strategic and normative steering of VET and leads national development. The Parliament decides on the legislation and the annual budget allocations to VET. VET is jointly financed by central and local government. The funding is based on an appropriation in the state budget. The funding is granted and paid directly to the VET providers, who decide on the use and allocation of the financing. The funding comprises strategic funding, core funding, performance-based funding and effectiveness-based funding. The share of strategic funding is at least 4% of the appropriation for VET. The remaining part of the appropriation for VET is granted on a basis according to which the share of basic funding is 70%, performance-based funding 20% and effectiveness-based funding 10%. The VET funding system rewards education providers for their outcomes, efficiency and effectiveness of their activities. The focus of funding is on completed units and qualifications, employment or placement in further studies after the education as well as the feedback collected from students in working life. (MINEDU, 2021b.)

The core funding covers 70% of financing of VET. The core funding is pertaining to calculation, meaning that the actual format of training or countable learning outcomes do not affect the level of funding in practice and the training providers are free to decide what type of training they will provide with the funding. Moderate student fees may also be charged for education (Act on the Financing of the Provision of Education and Culture). The volumes in short-cycle education and training are reasonably small, and for example, in 2020, approximately EUR 1 million was allocated to this type of training.

Organising additional options for short-term training does not increase the financing. Perhaps because of this, education providers have a perception that short-term training would not be adequately funded. This interviewees' conception was equally emphasised in the FINEEC workshop of 'The education system's ability to meet the challenges of continuous learning in situations of sudden structural change' in September 2021 (please see FINEEC, 2021). However, the scheme (qualification fee free, transparent, benefits) encourages participation in training leading to a vocational qualification (OECD, 2020a). Still, a full qualification program is not always the most appropriate and effective choice. The Local Government Act (410/2015) has a certain effect on the matter, i.e. municipal actors cannot offer training on the market (at least not in Finland/Finnish market) on a

commercial basis, but limited companies have been established to organise such trainings. These trainings do not accumulate any competence points because these commercial operators do not have permits to organise any vocational qualifications. The commercial provision of the trainings could be no matter how extensive/long but usually the offer consists of short courses. Operators have been able to develop their own scale indicators such as training days, work packages, etc. as measures to different formats of educational provision.

2.6.4.   Open University and Open Universities of Applied Sciences

Open Studies in Universities and Universities of Applied Sciences are open for everyone regardless of education and age. Open Studies aim to improve the know-how required in working life or general knowledge on topics of interest. They also benefit persons who plan on applying to a higher education institution. Open Studies offer teaching that is carried out based on the higher education institution's own syllabus. Studying at open UAS online courses make possible to complete courses conveniently regardless of time and place. Studies can be carried out as contact teaching, blended teaching or e-teaching - allowing to study alongside work. Almost all universities offer open university education. CampusOnline.fi ([2]) offers a selection of online courses by more than twenty Finnish universities of applied sciences.

Open Studies are mainly available for those who already live in Finland. Open Studies are not full-time and do not lead to a qualification (it is therefore not possible to get a long-term student residence permit based on Open Studies). It is not possible to complete a degree at an open university, but after completing studies at an open university, it is possible to apply a position as a degree student. Transcripts of records are delivered in different ways in different universities: e.g. My Studyinfo, Puro Service ([3]), and printed transcripts of records are available. Majority of higher education students can check their study attainments and degree information in the Puro Service. Finnish ID number is mandatory to use the Puro service. Applicants who have not ID number cannot access this Service. The information is retrieved from the national data supply of higher education institutions (VIRTA). Open studies are subject to a charge. However, UAS Students can select courses from another university of applied sciences free of charge and include these studies in their degree.

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(2) https://campusonline.fi/en/

(3) https://puro.joopas.fi/puro

2.6.5. Financial benefits for adult students

Continuing education, other than parts of vocational qualifications, is usually subject to a fee, but the amounts of fees vary from time to time. Employers or trade unions may cover study expenses, but Finnish employees have also other options. Adult education allowances and scholarships for qualified employees (Employment Fund, 2021) support adults in developing their professional ability and updating their competences. Adult education allowance can be granted to employees and entrepreneurs who have at least eight years of employment history. Scholarships for qualified employees are granted to people who are studying towards a vocational qualification and who have at least five years of employment history by the time they complete the qualification. Adult education allowances and scholarships for qualified employees are granted on the basis of the Act on Adult Education benefits (Finlex, 2000).

2.7. Who are the main users of microcredentials?

Previous chapters explain VET and Open Universities and Open Universities of Applied Sciences as main actors providing short-term learning activities leading to microcredentials and issuing microcredentials. Issued microcredentials are delivered in online services same than regular credentials (please see 3.2.). The results of the Microcredentials Survey indicates that VET providers if Finland issue microcredentials in both a paper format (n=4) and a secure digital format (n=4). Printed transcripts of records are available for the students from trainings that are not extensive enough to be stored in e.g. My Studyinfo. However, the current definitions of 'smaller fractions of competences' or 'microcredential' describe a concept of educational provision for which short duration has so far been identified as common denominators in a Finnish context. Still, the approach is complicated.

The results of the international Microcredential Survey describe that Finnish VET providers (EQF levels 3-8) employ a variety of different types of microcredentials. As the group of respondents was small (n = 5), no conclusions can be drawn from the results, but they nevertheless describe diversity and interest in microcredentials. Two of the five respondents offered more than 30 different Digital Promise -type of credentials. Academic and vendor specific certificates were also offered from an equally wide range of offerings. Open Badges and Professional certificates such as CertiProf were provided with less options (5-15/organisation) and vendor-neutral only by one provider (one to five options). Interviewed training providers from both private and VET sector emphasise that a vocational qualification unit is too extensive, and the current funding system does not encourage the provision of smaller fractions. 'Micro-training' opens new

opportunities for the training business on both public and private sector. At the same time, the education administration points out that there are no 'micro-degrees', as all qualifications must be based on existing frameworks. Mäkelä and Alanko-Turunen (2021) argue that the wording 'smaller fractions of competences' does not contain the same idea of validation of learning outcomes as the original report of the European Commission Expert Group (Andersen et al., 2020), which would be relevant for many learners. A common concern is that standardised vocational qualifications do not keep pace with the change in working life. Indeed, interviewees from different sectors raise the question: is a formal qualification always the most important achievement? While some professions are, of course, regulated by law, competence determines employment. The individuals should make use of all the competences they have acquired in also short-cycle education.

There is a growing demand for alternative credentialing and new technical solutions for assessment in working life. Private training providers have employed different tools for online digital certificates (e-certificate) as method of guaranteeing that a person has participated some learning experience (certificate of completion) or more importantly achieved a specific skill or competence (certificate of achievement). Some Finnish companies have extensive experience in employing digital open badges as electronic incentives in staff trainings, and new experiments are being prepared for different fields and industries. VET providers are ready and willing for cocreation and development of new bold solutions. They see flexibility as a key success factor in the educational provision, and hope that legislation will be developed to enable reactive solutions. For example, the interviewees suggested the development of a non-qualification apprenticeship training and suggested to apply badges in further and specialist vocational qualifications.

Finnish VET operators and Schools of Professional Teacher Education have been the first the pilot digital open badges, a type of microcredentials, in different kinds of trainings. Also, institutions of Liberal Education and non-governmental organisations (NGOs) have been active in exploring and issuing badges (Pakanen, 2020). These badges offer new tools for inspiring learning experiences, criteria-based assessment, and validation of prior learning (Brauer, 2019a; Pakanen, 2020). They also expand "the landscape of learning' (Grant, 2014, p. 5) crossing the boarders of educational sectors and institutions (Brauer, 2020a) and empower alternative ways of acquiring knowledge and skills (Devedžić and Jovanović, 2015; Knight and Casilli, 2012). 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 et al., 2018).

The badge-driven learning experience has been studied to some extend (e.g. Brauer, 2019a; Korhonen, 2020; Korhonen et al., 2020) but how badge owners display and share their achievements for example during the period of unemployment requires more detailed research (Brauer et al., 2021). In practice, digital open badges offer to inform and improve both professional development and professional knowledge constructions. These new tools offer to visualise different competences and study paths for acquiring them. Still, the knowledge transformation process has yet to be explained in different contexts as different stakeholders have various value expectations of badges and other alternative credentials.

2.8. What are the main and most important characteristics of microcredentials?

The results of the desk research relate and recognise all different aspects of the preliminary working definition for microcredentials proposed by the European Commission (Andersen et al., 2020). However, the results of the Finnish case study emphasise the conception that a microcredential equals an actual learning activity, a short-cycle education and training that delivers smaller fractions of competence (EDUFI, 2020). The development of these constructions is aimed supporting better provision for re- and upskilling opportunities with an emphasis on continuous learning in working life (MINEDU, 2020). The interviewees of this study on education administration stressed the importance of distinguishing learning opportunities from learning outcomes. However, only one group of interviewees suggested that it would be good to link microcredentials to learning outcomes, and related practices.

Evidence of learning outcomes (credits and badges) are seen as secondary objectives of the development work. Hence, the development of new digital platform(s) used for the short-cycle education and training provision aim to maximise the impact of microcredentials (MINEDU, 2021a). The need for a definition that clearly indicates whether a microcredential always refers to some formal education or course, or whether it can also represent criteria-based digital open badges granted based on demonstration of a competence is also obvious (MINEDU, 2021a). However, based on the interviews, an interpretation can be suggested that the microcredential is a sufficiently broad entity (e.g. 5-60 ECTS) that always corresponds to the grade. Digital open badges can be smaller competence descriptions that better meet unique individual needs for competence development and employment. Transparent standards are not emphasised in the discussions, perhaps because Finnish vocational qualification structure (based on

FiNQF) already allows professional development based on smaller units under pinned by firm standards and certified documentation of deliveries (My Studyinfo and the Koski database, please see 3.2.).

2.9. Are there any sectors / occupations where microcredentials are prevalent, relevant and important? Please provide a detailed overview of the use of microcredentials in the sector / occupation.

The most important solution of microcredentials described by the teaching administration officials and public servants is the existing unit structure of Finnish vocational qualifications explained in section 2.6. As no sector specific importance was reported by the informants, this section of the case study aims to draw a wider view on Finnish developmental efforts related to microcredentials as a proof of learning outcomes. The following section represents additional examples of recognised good practices crossing the boarders of educational sectors and training institutions. Focus is on the implementation of trainings and advanced assessment practices featuring digital open badges. The cases present different approaches on badging practices focusing on (a) well-known competence development in the field of trade; (b) future career paths in games industry; and (c) cross-sectoral verification of adults' basic skills. Finally, relevant breakthroughs are presented at the context of Professional Teacher Education.

2.9.1. Develop your skills at K Group

KESKO is a Finnish trading sector pioneer. They operate in the grocery trade, the building and technical trade and the car trade. Their divisions and chains act in close cooperation with retailer entrepreneurs and other partners. The chain operations comprise some 1 800 stores in Finland, Sweden, Norway, Estonia, Latvia, Lithuania and Poland. Together, Kesko and K-retailers form K Group, whose retail sales totalled approximately EUR 14 billion in 2020. K Group is the biggest trading sector operator in Finland and one of the biggest Northern Europe. KESKO and K-retailers employ together some 39 000 people. (KESKO, 2021)

The systematic, business-driven development of staff competences is seen as a critical factor for future success at K Group. 'The transformation of the trading sector, digitalisation and continuous changes in working life act as drivers for future

development needs' states KESKO Annual Report in 2019. Key areas of competence building in K Group are (KESKO, 2020):

(a) leadership and management;
(b) knowledge work;
(c) interaction and self-management skills;
(d) training for store personnel: sales, service and product competence.

Via K-Academy, they provide store personnel with professional training in the form of coaching and e-learning as well as an opportunity to complete vocational degrees. Training costs were almost EUR three million in 2019. Long careers are not rare: 1 059 employees in Finland have worked at Kesko for over 25 years. In Finland, 34.7% of the employees have worked at Kesko for over 10 years and 65.3% under 10 years, and in the other countries the figures were 18.8% and 81.2%, respectively. They have started several programmes in recent years to employ young people and people from special groups and employing them has become a permanent operating model. In the future, immigrants will be an increasingly important target group for recruitment into service positions in the retail sector. At present, the highest number of immigrants are employed in the stores and warehouses of K Group. Employing people with an immigrant background will require new operating methods – for example, the needs of people whose first language is not Finnish must be taken into account in guidelines and management. (KESKO, 2020)

As professional careers no longer advance on a single straight line, K Group prefers to talk about career maps over career paths. K-Academy provides a wide range of training that supports professional development. Further, K Group has been training workplace instructors for stores, and by the end of 2019, more than 700 workplace instructors had been trained. K group sales masterclass is the most popular of the trainings. It provides vocational training to approximately 21 500 students annually in the K-Group, VET institutions and UASs. The concept is a nationally unique implementation that transcends the boundaries of educational institutions and supports the working life relevance of education and training in different sectors. The trainings form a continuum as in-service training within the industry. The concept is nationally exceptional, and it has been developed for over a decade. Also, approximately 200 suppliers participate in the implementation of the training each year. (KESKO, 2020; 2021)

K-Academy is a real working life pioneer in the application of digital open badges to the development of staff competences. The first K group badges were awarded in December 2015 (Lähde, 2016). They have applied digital open badges

for different purposes, but one of the most well-known solutions is 'Mestarimyyjä', Master Salesperson Programme (Figure 2).

Figure 2. Digital open badges provided by the K Group

Source: Lähde (2016)

The K group sales masterclass online training is passed when all training modules and related tasks have been completed and the participant has achieved the minimum number of points. Participants can print a certificate of the approved performance on the certificate page of the online training. They will also receive a competence-based Open Badge badge for the approved performance. The best students will be awarded scholarships. But why the biggest trading sector operator in Finland choose to use the badges? Lähde (2016) has listed the following recognised benefits:

Benefits within the K group
(a) the K Group has training/competences that are not recorded in the human resource management system (e.g. The K group Master Salesperson programme, positions of trust, etc.);
(b) finding new experts through competence-based open badges.

Benefits outside the K Group
(a) verification of the competences of the temporary workforce (e.g. statutory training);
(b) cooperation between working life and educational institutions (e.g. Master Salesperson programme, and retail trade and entrepreneurship trainings);
(c) strengthens the K-Group's employer image.

Benefits for the K Group badge earner
(a) competence information is managed by the recipient (also after leaving the K-Group);
(b) can be used when applying for jobs in the K-Group or for other positions within the K-Group;

(c)　a transparent way to visualise and share achieved competences e.g. on social media.

Open Badges complement competence development at the K-Group. The value of badges as a verifier of entry-level competence was also emphasised in the interview. K-Academy developers (Lähde, 2016) advise to consider how the badges fit into the company's service package in general. They also recommend investing in communication, as cultural change takes time. Here, too, the old truth works that quantity does not replace quality. Key success factor is, that the recipient appreciates the incentive. K Group provides employees with instructions on how to reposit badges and instruct for example display them in a LinkedIn profile. Still, employees have made little use of the badges in this way. For this reason, the company is now investing more in the development of certificate-type training, for example in the IT department. However, already developed badges are part of the Master Salesperson programme, and K Group continues to develop and promote shared training portal K-Academy.fi and, close collaboration with VET and UASs.

2.9.2.　Desired competences for games industry

In Finland, the Chips for Game Skills project (2017–2020) aimed to define the criteria for future skills in the games industry and to cross the boundaries of educational sectors. Both UASs and VET institutions were involved in the project that also engaged companies and NGOs of the games industry. Junior professionals' job search challenges and recognised competence shortage within the industry initiated the project. The main goal was to map competences required in working life. The employer perspective was brought up, emphasising how important it is for an entry-level candidate to (a) understand the recruitment process; (b) get to know the companies; (c) identify individual potential and accomplishments; and (d) communicate them clearly to the employer (Chips for Game Skills, 2020). The need for standardisation within the games industry was indicated as an important factor by industry professionals themselves. (Brauer and Korhonen, 2021)

The Chips for Game Skills badges met these recognised needs profiling specific jobs in the industry. Each metabadge represented proof of the required level of mastery of a specific skill. The badge constellation of competences was focused on promoting the identification and recognition of working life opportunities (the needs of working life, job descriptions) while helping individuals to plan competence development (optional study paths) as future professionals in the games industry (Brauer, 2019c). In the Chips for Game Skills project, the expertise required was represented by badges earned through work assignments based on

assessment criteria and required evidence (Figure 3). The badges represented both professional and generic competences (working life skills and transversal skills). This approach is particularly useful for competence development in growth industries such as game development, as it allows positions to be filled that do not align with the curricula of degree programmes (Brauer, 2019c; Brauer and Korhonen, 2021). This stems with the Microcredential Survey results as the Finnish VET providers emphasised microcredentials as a tool to increase speed with which various education and training needs are being met.

Figure 3. Different ways to achieve the competences required in working life

Source: Brauer (2020a).

The original Chips for Game Skills badge constellation was developed as collaboration between the game industry's employers and educational institutions. The badge constellation described the emerging needs of working life and entirely new competences. On a flexible study path, personal customisation means having the option to select badges from different badge families (Gamrat et al., 2016) and the ability to accumulate credentials from various sources (Casilli and Hickey, 2016). When work and the ways of doing work are changing, professional development should be equally flexible, if the employment rate is to increase. Digital open badges and related competence-based approaches will help educational institutions to develop not only workplace training but work-integrated pedagogy together with industry players. The role of education organisers will also change when competences acquired in working life can be acknowledged. (Brauer and Korhonen, 2021)

2.9.3. Guild Schools – reactive strategies in new environments

The previous cases give two good examples where development work meets the essential needs of working life. Vocational education provides a wide range of multidisciplinary badging cases as inspiring examples of pedagogical development that supports learning processes to a great extent. The application areas include, but are not limited to:

(a) badges for common units of vocational qualifications (national badge constellations);

(b) badges to inform and promote competence-based approach: criteria-based badge constellations and required evidence;

(c) digital open badge-driven learning: gamification in vocational studies;

(d) joint educational efforts with industries: working life assessments;

(e) private and public provision of short term training (certificates).

In general, digital open badges offer to inform and improve both professional development and professional knowledge constructions to develop different competences (Brauer and Korhonen, 2021). An example of Guild Schools (2021) for students and teachers offers to support project-based learning, 'master-journeyman-apprentice model' and 'Learning from equal'-model accelerated by open badges. These kinds of reactive models apply already established pedagogical models in new environments.

Figure 4. Examples of Guild Schools' badges

Source: Guild Schools (2021).

The purpose of the teaching staff's badges is that the complex Guild Schools operating model would be more visible to a wider audience and could be introduced step by step for new users. Guild schools use digital tools to support learning process. Students document their learning, which helps to outline what they have already learned, as well as pointing out things that require additional learning. Digital tools are used to communicate with teachers also in the workplace.

The student's digital portfolio is utilised in demonstrating competence. An additional 'Digital Workplace Instructor' badge is currently available for the Guild Schools network's working life partners. All applications of the Guild Schools model are Creative Commons licensed (CC_BY_SA) and free to use in multidisciplinary learning design.

The following example illustrates another case crossing the sectoral boundaries of degrees and educational institutions.

2.9.4. Competitive Skills – Competence for problem solving and ICT

Competitive Skills is a national initiative to improve education and training and ensure that the basic skills that make individuals more competitive on the jobs market. The initiative project (2019-2021) was financed by the European Social Fund. The aim of the project was to develop a nationwide open badge constellation, which enables the verification of adults' problem-solving skills in technology-rich environments (PSTRE, The Programme for the International Assessment of Adult Competencies, PIAAC) by identifying and recognising competences acquired outside the formal education system, at different levels of education, and in transition phases of the educational system. In addition, the project provides a requirement framework of competence (determining the composition of objectives, core contents and assessment criteria) for securing IT-related problem-solving skills in non-formal education.

The project group created a competence-based skill set (Figure 5) for people with inadequate ICT and data management skills and a national competence constellation for problem-solving skills in information technology.

In the future, the national Competitive Skills - badge constellation seeks to be employed both in liberal adult education and VET. The model suggests taking advantage of the training modules created in the project and informs how to integrate digital badges and learning analytics to different learning environments. Moreover, badges offer to promote information on how and why competences should be validated. Competitive Skills badge constellation was built to meet requirements of different frameworks such DigComp (The European Digital Competence Framework) and the National qualifications framework (NQF), that classify qualifications by level, based on learning outcomes. The badge constellation is now finalised, and it will be available for wider audiences from 2022 onwards.

The process and structures of the national open badge constellation, and the educational model will be eventually published in TIEKE's (the Finnish Information Society Development Centre) service, where the system will also be centrally

updated in the future. The TIEKE website ([4]) will also contain requirement framework of competence (determining the composition of objectives, core contents and assessment criteria) for securing IT-related problem-solving skills in non-formal education. This will allow an equal, egalitarian and transparent way of ensuring future IT skills in different type of training and by different organisations. The model will be published with a Creative Commons license and will be freely available to various training providers for non-commercial purposes.

Figure 5. Competitive Skills national badge constellation

Source: Competitive Skills (2021).

The Competitive Skills project was based on the idea that even the smallest recognition of competence can support, for example, an immigrant or newcomer in employment, for example in assisting positions on various sectors. The badge constellation and related learning materials were piloted in 2020-2021 with different target groups within vocational education and liberal adult education. Those pilots were aimed to ensure the basic ICT and data management skills of the students involved in the project, as well as they did familiarise their trainers and

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(4) https://tieke.fi/en/projects/competitive-skills/

teachers with digital open badge-driven learning. The national Digital and Population Data Services Agency (the Finnish Digital Agency) has been also one of the active partners for the network to extend piloting focus groups.

Public services are becoming increasingly digitalised and there are many people who do not know how to use digital services. Digital support helps those who need assistance. In digital support, citizens are provided guidance on the use of e-services and smart devices. The development of digital support for citizens is a permanent service of the Digital and Population Data Services Agency. The Agency provides different types of assistance, such as instructions and training. Digital support is provided by municipalities, public actors, organisations, different projects and companies. Peer support and support at home or at service points are important forms of support. The Agency develops national digital support and coordinates the operation of the digital support network. The Finnish Digital Agency has built their own Digital support skill badges for those involved in the network. Digital support providers need many types of competence. They have often acquired competence not only through studies or work experience, but also in hobbies, voluntary activities or other contexts. They do not always have any documents to prove their competence and the competence is not easy to describe. The Digital Support Provider skill badge offers support for identifying and verbalising one's own competence (Figure 6) (the Finnish Digital Agency, 2021).

Figure 6. Digital supporter badge by the Finnish Digital Agency
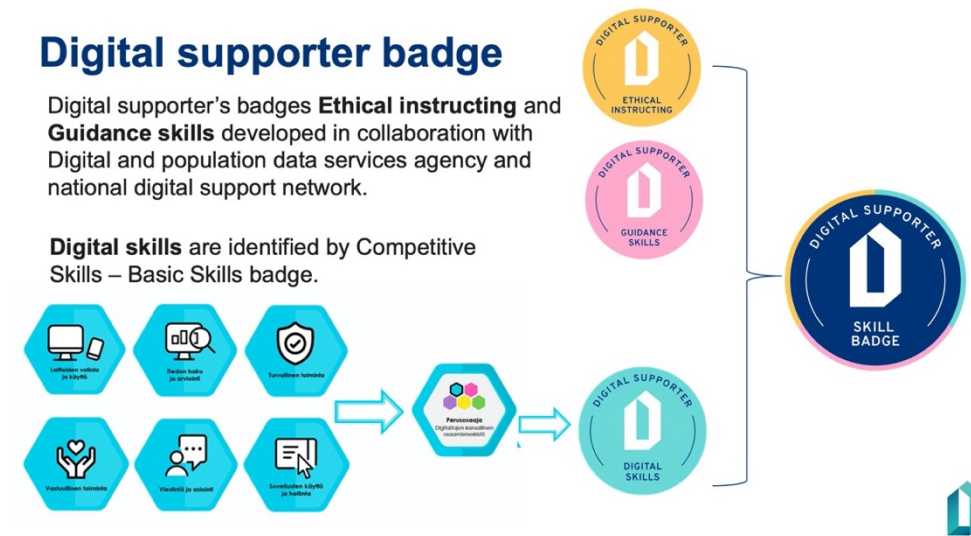
Source: The Finnish Digital Agency (2021).

A digital support provider can use the exercises completed online to assess their own competence in digital skills, guidance skills and the ethical guidelines for digital support and, if they wish, apply for a skill badge to prove their competence. Digital skills are identified by Competitive Skills – Basic Skills badge. Thus, the constellation provides an excellent example of stackable achievements that allow to combine smaller credentials into a larger entity. The skill badge is free of charge and every digital support provider can apply for it.

The Agency's mission emphasises that digital skills are a matter of competitiveness in the job market and that digital skills are required in all sectors and all roles in the world of work. According to a recent study by the Finnish Institute of Occupational Health, approximately one half of Finnish people have sufficient digital skills for working life. There is a recognised gap between those who have the ability, motivation and opportunity to use digital applications, tools and services in the workplace in a skilful and versatile manner, and those who do not (Tuomivaara and Alasoini, 2020). The other half of the population has problems, and even if the problems are not consistent, they may prevent people from learning new things.

2.9.5.   Badge or certificate: Microcredentials for ICT-professionals

The results from Microcredential Survey pointed out that alternative incentives could be preferred in the field of engineering, manufacturing and construction and they were considered essential related to information and communication

technologies. This section represents a business case focused on ICT professionals.

ICT companies are often known for their impressive certificate systems. These documents certify participation in training and/or demonstrated knowledge and abilities (e.g. in certification exam) related to, for example, specific solutions or work practices. ICT certifications can help individuals quickly gaining and validating valuable skills and know-how in a domain that will further their career. Some of the certifications are aimed at those working in IT. For example, to qualify for a specific exam, at least five years' experience may be required. Here are some examples of the most popular IT certifications today:

(a)   Amazon Web Services (AWS) Certified Solutions Architect – Professional
(b)   Certified Cloud Security Professional (CCSP)
(c)   Certified Information Security manager (CISM)
(d)   Certified Information Systems Security Professional (CISSP)
(e)   Microsoft Certified Solutions Associate (MCSA)

These kinds of certs hold value as globally recognised achievements granted by large corporations. However, other solutions are on demand. Next, we represent an IT case from Finnish SMEs.

Ilona IT Ltd is a learning technology expert, reseller, and educator. They want to help their customers use technology smartly. Their customers serve educational sector, all grades from early childhood education to universities all over Finland. The company is well known for their early adopters. For instance, they have developed the Emill platform for sharing and developing personal expertise alongside work ([5]). They provide in-service training funded by the EDIFI for teaching and guidance staff at different school levels, as well as commercial training provision specifically related to various technological applications. Ilona IT has been one of the first companies in Finland to develop digital open badges. The first glance on their badge development from 2015 explain badges as a tool to:

(a)   enhance the quality of training;
(b)   promote trainings;
(c)   reach different customers;
(d)   to demonstrate competences (Korhonen, 2015).

However, digital open badges are not offered for all trainings. The key is that the verification of competence must be relevant to the recipient of the open badge. In addition to badges of excellence, the company also offers badges of participation in, for example, educational fairs and other events they organise.

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(5) https://ilonait.fi; https://emill.fi

Instead of competence objectives and assessment criteria, these tokens include, for example, the program of the event as a souvenir.

Figure 7. Example of badge of participation by ILONA IT

The main problem is that the badges of excellence and competence-based approach are not yet sufficiently recognised in working life. However, ILONA IT sees them as having great potential, as documents that describe the competence achieved to a greater extent. The notoriety should be similar to the well-known international IT certificates in the field that at least communicate about the study skills and persistence of their holders. Still, well know certs such as Microsoft Imagine Academy ([6]) for students and educators (the curricula and certifications they need to succeed in a technology-driven economy) does not provide solutions that would inspire widespread adoption.

The resources of companies to develop high quality badges are limited. Private providers would be happy to utilise, for example, digital open badges related to the qualification system, if those were available. On the other hand, it is important for the company to highlight their unique training offerings, competences that cannot be obtained anywhere else and to verify these achievements with special ILONA open badges. ILONA open badges are perceived as more important for the company's own training designs, instead of training e.g. an application as a retailer. However, standardised badges for training different applications and platforms would be used, if those were provided for instance by some formal educational institution that shares badges with other OBF user organisations.

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(6) https://www.microsoft.com/en-us/education/imagine-academy

Table 2. Examples of badges

How to use Zoom?	No badge, but if there were a standardised ready-made badge for Zoom, ILONA would issue such.
How to use Zoom in education and training?	A specific ILONA badge of excellence granted.

Source: ILONA.

Option to share these badges e.g. for the New Europass is interesting to the company only if (OBF) badge integration and use of open application programming interfaces (APIs) is extensive and completely effortless for the company. However, the value of badges in international education and training business is notable for both of the learner and marketing the brand of the training provider. What about ILONA's IT trainers, do they have certificates? The company's employees are required to achieve various IT certifications as they operate as a retailer. In general, staff trainings are considered important, and everyone is encouraged to participate to trainings of their individual interests.

So, what is the key difference between a badge and a certificate in a training business? The certificate always has the same content regardless of the country and a standardised, globally equal structure. This has its pros and cons as the certification system is both inflexible and robust but globally known. Still, certs are not always the best tool for a company to identify the skills of a potential employee. Why hire a person with a certificate from a document editor application? Why does anyone get so excited about a simple app? In the time required by the certificate, something more professionally meaningful could be developed. Open badges are needed because the range of required competence in working life is way wider than certificates. Smaller fractions of competence need to be recognised. Open badges are also a pragmatic way to replace course certificates in, for example, liberal education. However, interviewee sees competence-based badges of excellence as national, and think it is unlikely for a private provider to rise to a global level.

The most important thing in the development of digital open badges and related applications is that badges should be easy for the end user. The recipient of the badge, the badge earner, should feel effortless to share the badge visible to the public e.g. in LinkedIn. The benefits of badges should also be clearly described to the badge earners. How to use the incentive, for example, for employment or within the organisation for career development. Above all, the technical system must be easy to use on different devices for the admins, operators and end-users such as badge earners.

2.9.6. Badges for manufacturing – and nano-learning for digital revolution

One aim of this study was to interview the manufacturing business in Finland that were known to be badge active. However, brief email conversations with the company representatives revealed that their development work is at an early stage and cannot yet be described structurally. Similar findings were resulted when contacting engineering and construction companies. However, companies' goals to develop their own training offer to describe a broader change and need for competence development during individual careers. A recent report by Confederation of Finnish Industries (2021) addresses 'New Skills and Learning in the Digital Age'. The report's case of workplace learning by Fortum explains industry needs and new practices as following:

'Online training is also changing, and one of the forces for change is nudging. It means very short about a minute and a half long 'lessons', where the message is squeezed right to the core. Fast, easy-to-absorb and memorable messages come regularly. The power of nudging is precisely in speed, in clarity and density. Boije af Gennäs compares e-learning to a book and nudging to a TikTok video. You focus on the book or browse for a longer time. Something will probably stay in your mind, but you hardly return to the topic. The TikTok video comes and goes, but repetition and the continuum leave a trace of memory and begin to affect behaviour. Both are needed, but when it comes to changing behaviour, nudging like nano-learning has been researched and it works. We started figuring out how we could take advantage of it. We first made a pilot that dealt with data security. First the actual nano-learning package included ten, about one minute "lessons" of leadership. There we talked on a personal level about how we see leadership and how we lead ourselves.'

Fortum founded their own 'Academy' for technological know-how needs. The reported description is a good example of how companies really need micro-level learning solutions in addition to existing short-cycle education and training provision.

2.9.7. Competence-based professional development for vocational teachers

Teacher trainers of vocational teacher programs (Isacsson et al., 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 educational reforms and to see the effects of digitalisation on different disciplines (Brauer, 2019a; Koramo et al., 2018). As a focus group piloting digital open badge-driven learning, their experiences, views and ideas are more than noteworthy. The following sections describe some of these cases from Nordic

teacher education to explain the current state-of-the-art related to open badges in Finnish education. These examples have been reported in several scientific studies, for example in doctoral dissertations (see Brauer, 2019a; Korhonen, 2020). Based on proven models, in-service teacher training is currently being planned, e.g. Latvia, Lithuania, Portugal and the Czech Republic (DIG4VET, 2021).

2.9.7.1. *Learning Online – Professional Development for Vocational Teachers*

In 2014, two Finnish 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 continuing professional development to design a competence-based professional development programme (PDP) that would support teachers in building working life ICT skills and knowledge. The program exceeded all intended learning outcomes in the first year both in terms of quantity and quality. By August 2021, in-service teachers have applied for (and received evaluations for) 29 552 Learning Online Badges, the number of pre-service applicants is equally impressive. Since 2015, badges have been applied in professional teacher education qualification programs for VET pre-service teachers by individual Schools of Professional Teacher Education managing their own badge factories. The nationally exceptional success of the PDP draws heightened attention to digital badging and gamification in educational contexts. The programme is funded by the Finnish National Agency for Education (EDUFI) and was awarded with a Quality Prize for improving eLearning operations and activities in Finland in 2015. The programme's outstanding learning outcomes have led Finland to develop the model of badge-driven learning on a national level within different degrees and various disciplines.

The cocreated Learning Online PDP is 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 et al., 2017). In Learning Online, digital open badges offer novel possibilities in identifying and recognising digital pedagogical competences independent of how they were acquired. The current design considers DigCompEdu-framework (Redecker, 2017) including meaningful use of gamification in learning and public sharing of expertise in order to support shared learning within work communities. In total, it is possible to achieve more than 50 different competence-based badges, based on the proficiency goals and assessment criterion, and the competence demonstrated by the applicant accordingly. In Learning Online, the three successive stages follow a

level structure: Digi-User (10 badges), Digi-Expert (25 badges) and Digi-Developer (45 badges). 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 participants to apply acquired skills and knowledge immediately in practice (Brauer, Kettunen et al., 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, 2019a, pp. 36-39). The participants apply for competence-based digital badges by providing the required evidence of the competence in question. Scaffolding is provided related to the remediation and rejection of badge applications. Participants are also engaged in a Facebook-based study group. 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. The Learning Online landing site is an economical example of an open online education implementation, 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.

In Learning Online, digital open badges represent a main tool of the game design (Brauer and Siklander, 2017; Deterding, 2015). After thorough research and comparisons between different technical settings, designers settled on Open Badges (Mozilla Open Badges, 2021) and OBF to power the game engine of Learning Online. 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 of 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. Badges also provide a chance to promote a meaningful learning experience; sense of community, and the experience of inclusion, equality (Mäki et al., 2015). Teachers who have participated in the program have often become badge developers in their own organisations and in national and international projects (see e.g. CORE, 2020).

2.9.7.2. *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 (2018-2020) followed in the footsteps of

Learning Online by creating and establishing a national digital badges system to support the recognition and acknowledgment of professional competences for vocational teachers. 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. Nevertheless, the objective of the initiative is to support the change of vocational teachers' competences after the reform in the vocational education and training sector in Finland (Korhonen et al., 2020). The project was 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 and Stoll, 2016). During the teachers' badge initiative, the open badge constellation was created that contains six competence areas: Learning and Guidance, Networking, Working Community, Development, Personalized Learning, and Assessment. The definition of these competences based on several frameworks, such as European Union's DigCompEdu (Redecker, 2017), and earlier experiences and processes, such as Kullaslahti's et al.'s (2019) digital and pedagogical badges.

Teacher's badge constellation is not in its final format since new competences as open badges are developed constantly in several projects in Finland. The network of teacher's badges will manage the process of taking new competences and badges into the constellation. The network ensures the quality of the chosen open badges (objectives, criteria and competence). It seems that vocational teachers are willing to make their competence demonstration via the teacher's badges when objectives and criteria of a badge are giving a real insight of teacher's competences that is not mentioned in the certification of the formal teacher education (Korhonen et al., 2020).

2.9.7.3. *The EU-project: Soft Skills Training and Recruitment of Adult Educators*

There is very little research of soft skills, transversable skills, general skills, core skills, and life skills that all refer to similar skills and competences that are required increasingly in workplaces and therefore also teachers would need more competences related (Ruhalahti and Korhonen, 2021). Erasmus+ program SOSTRA (Soft Skills Training and Recruitment of Adult Educators) developed methods to study soft skills in an online learning environment (HAMK, 2021) and the badge-driven learning structure (Brauer, 2019a) was applied to the learning process. The project staff defined 15 soft skills that they discovered by survey in five countries (n=547). Then the learning process was created; competence objectives and criteria were created as open badges (15), learning materials were produced and the self-directed learning process was composed in a digital learning environment (Google Sites) with the open badge management system (OBF). The open badge application forms were linked into Google Sites pages. Six language versions were adapted (Finnish, English, Spanish, Italia, Polish, and Romanian). The scaffolding for participating students was connected to the process (badge-driven learning structure) itself and scaffolding was provided easily to participants when it was needed via OBF (Korhonen, 2020).

Figure 8. Competence-based digital badge-driven learning process of Sostra

DISPLAY

REFLECT

SELF REFLECTIVE TEST

GAINING
KNOWLEDGE
AND SKILLS

ACCREDITATION:
DIGITAL BADGES
ARE ISSUED
BASED ON AN
APPLICATION

SOFT SKILLS DIGITAL BADGE
LIBRARY FOR ADULD
EDUCATORS

EARN

LEARN
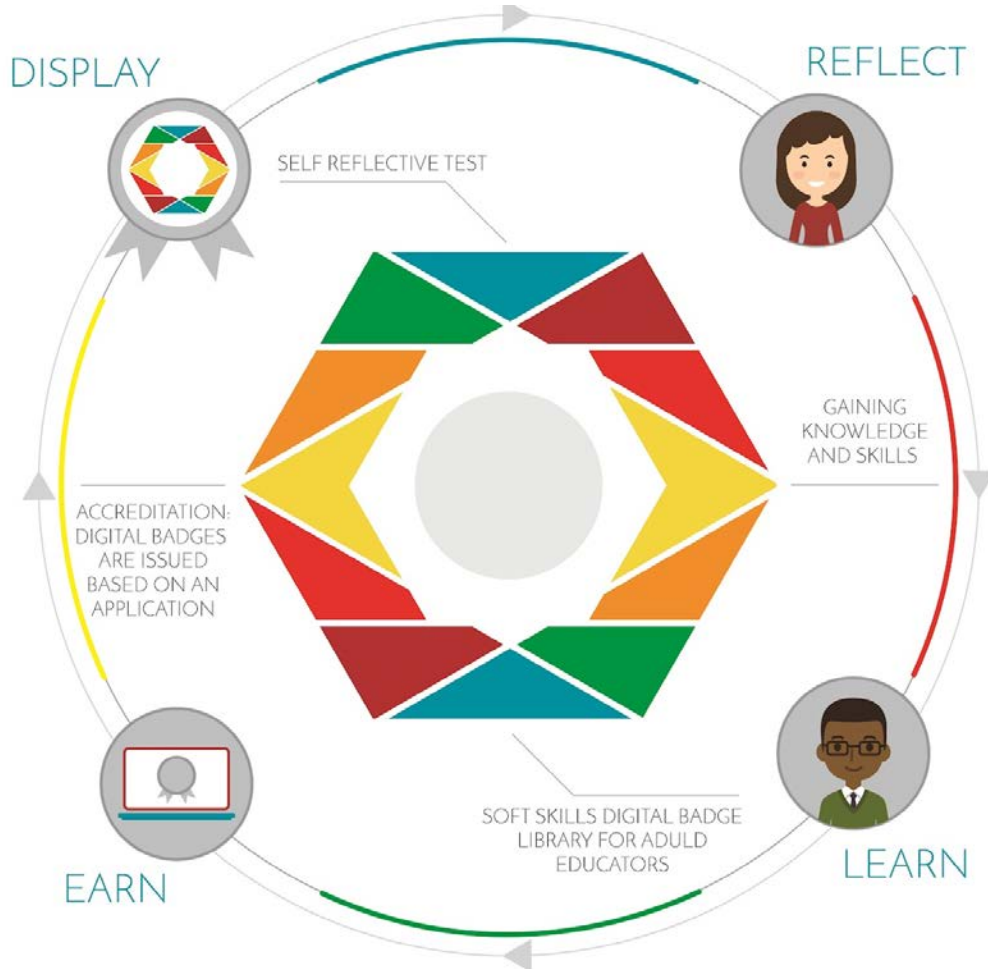
Source: HAMK (2021).

Participants demonstrated their competences in a versatile way and in digital format (Lindroos and Korhonen, 2020). During the project pilots 274 open badges were issued totally in all six language versions while most of the open badges (101) were applied in English version (Ruhalahti and Korhonen, 2021). There were 123 participants in the pilots and the amount of the application per participant varied from 1 to 15 (Ruhalahti and Korhonen, 2021). The materials that the project produced, the learning environment and the 15 open badges, are used after the project in pre- and in-service teachers' education programs in three languages (Finnish, English and Spanish).

Figure 9. Soft skills of adult educators
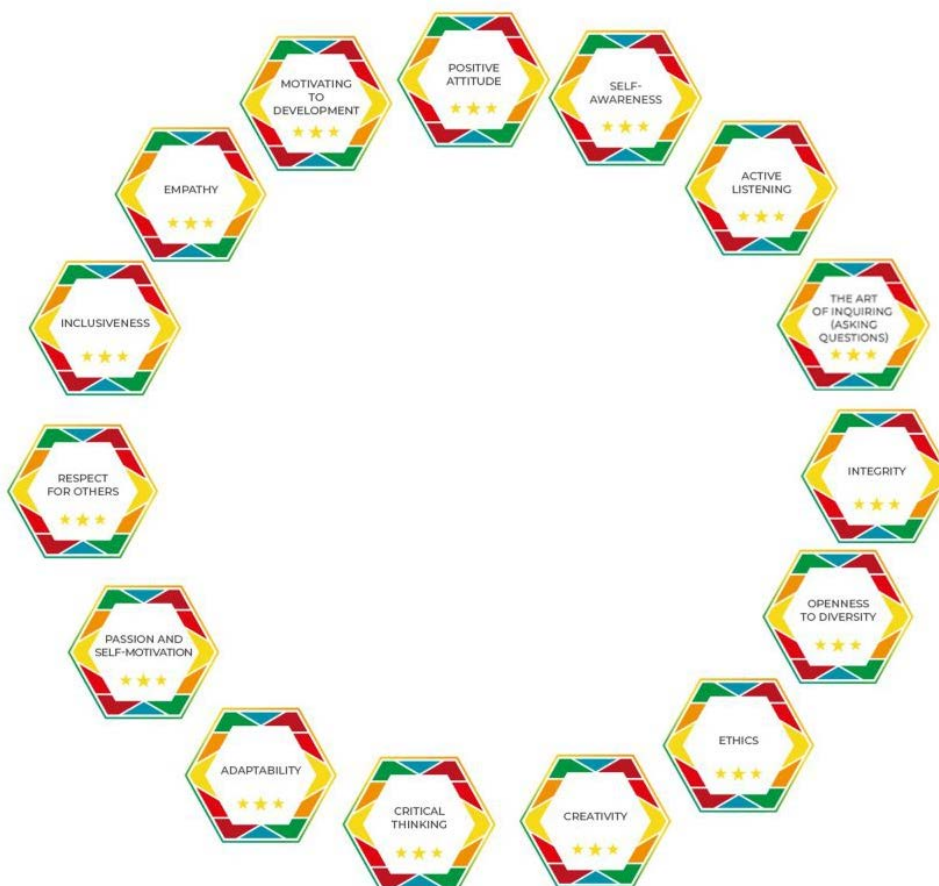
The topic, soft skills, is constantly interesting student teachers and the created self-directed learning process is easy to adapt to various learning processes, however, it requires constant updating to the learning materials as well to the open badges.

Badges have indeed proven to be an important tool in developing the competences of teaching staff. In addition to national and multinational projects, digital open badges have also been adopted in professional competence development by individual organisations. For instance, the city of Helsinki launched Badges for Teaching (staff's core professional skills) in August 2017 with three skill levels and total of 21 evidence-based Learning Badges. They have now granted more than 36000 skills badges for more than 4 500 staff members and reached all their performance goals.

CHAPTER 3.   Analysis of microcredentials and evolving qualifications systems

Finnish education system is one of the most successful in the world (OECD, 2020a). Further, national reform of continuous learning (Ministry of Education and Culture, 2020) emphasises continuous learning in working life. To maintain our remarkable performance, the educational system needs to adapt to a rapidly changing labour market. As explained in previous sections, Finnish VET reform (from 2018) has updated the entire concept of vocational education and training in Finland. The key principle is continuous competence development. All three types of qualifications – vocational qualifications, further vocational qualifications, and specialist vocational qualification - are composed of units of learning outcomes – smaller fractions of competence. A vocational qualification gives general eligibility for university of applied science and university studies (MINEDU, 2021c).

VET competence requirements are the same in all learning environments, also in workplaces. Qualifications are the same for young people and adults. Vocational qualifications consist of vocational units and common units. Further and specialist qualifications comprise only vocational units and the necessity for common units is assessed when preparing the personal competence development plan. Vocational units are either compulsory or optional. Vocational qualifications are also independent of the way the vocational skills have been acquired. As long as the individual's competences meet the national qualification requirements, they can be acquired in different learning environments and ways, at different times. Students demonstrate their skills in practical work. This has enabled new ways to develop learning and the identification and recognition of competences. VET provides skills for both life and work. Students can complete entire qualifications, parts of them or smaller units, or combine parts of different qualifications based on their needs. (MINEDU, 2021c)

Lessons learned (see 2.9.4. for Competitive Skills) describe well established practical implications that offer a wider view on VET bridging to other educational sectors. These experiments have been aimed at (a) development of motivational learning; (b) introducing new tools for validation of prior learning; and (c) drafting bold visions of the new era of blockchain degrees. The national qualification systems seem to meet the requirements of evolving practices in terms of content i.e. qualifications structure supporting smaller fractions of competence. However, there are several notions to consider related to current educational legislation in Finland which prevent and slow down the implementation of new practices related to both microcredentials and/or badges.

3.1. How are microcredentials linked to and/or integrated into qualifications system? How do they operate outside national qualifications system?

The Finnish National Framework for Qualifications (FiNQF) describes the qualifications, syllabi and other extensive competence modules that belong to the Finnish national education system. The FiNQF includes, among other things, general education, vocational education and higher education. The Finnish qualifications framework is based on the European Parliament's and Council's Recommendation on the European Qualifications Framework for Lifelong Learning (EQF). The Finnish qualifications framework is also in line with the European Higher Education Area (EHEA) qualifications framework. The education providers indicate in student's degree certificate, certificate, or Diploma/Certificate Supplement the reference level of the qualification, syllabi or competence module in the national and European qualifications framework. (EDUFI, 2021)

The current development lead by MINEDU (Finnish Government, 2021a) aims to define the role of the microcredentials in relations focused to the credit system in HE and PHE provision. The short-cycle educational provision in Finnish VET already allows students to advance or supplement their vocational skills without having to aim at completing a qualification or its part. These smaller fractions of competence sets are automatically linked to the NQF and the VET provision links the outcomes as completed units (ECVET, competence points) to the credit system and LRSs equal to full qualifications.

3.2. How are microcredentials linked to credit systems?

Preliminary working definition for microcredentials proposed by the European Commission emphasises microcredentials as a proof of the learning outcomes that have been assessed against transparent standards. Four out of five Microcredentials Survey respondents from VET providers linked their microcredentials to some standard. However, two of the same five respondents indicated that even if the microcredential specifies the learning outcomes, they were not formally assessed during the process. Two of the five respondents followed internal quality assurance based on transparent quality standards. Yet, the same number of VET providers could not say how quality was ensured. An already identified challenge in the Finnish education system is how to validate

digital open badges, and how digital open badges are valued in comparison to actual grades (Competitive Skills, 2021).

3.2.1. ECVET, ECTS and microcredentials for digital life event ecosystems

The European credit system for vocational education and training (ECVET) and European Credit Transfer and Accumulation System (ECTS) are key instruments for the accumulation and transfer of knowledge, skills and (wider) competences expressed and measured in terms of credits ([7]). ECTS credits express the volume of learning based on the defined learning outcomes and their associated workload. In this system one full-time academic year is equivalent to 60 higher education credits. ECVET is based on the division of qualifications into units and on the description of learning outcomes of each unit using the three descriptors of EQF; knowledge, skills, and competences, making clear the EQF level of reference. Qualifications and units are represented by a specific number of credit points. Credit points express the volume of learning outcomes in each unit and provide information on the relative weight of the units which make up a qualification (Wagenaar, 2014).

Whether achieved credit equivalency as ECVET and/or ECTS should be indicated in 'microcredentials' (e.g. in the new Europass) is now a solid case for discussion in various forums. Fortunately, majority of VET provision is available free of charge, and these achievements, "microcredentials', can and will be credited. The technical solution exists already as all transcripts of records are delivered in My Studyinfo. Printed transcripts of records are also available for the students. However, the interviewees of this study on education administration stressed the need for an easier user-centric system. They suggest emphasising option to build criteria-based competence descriptions, and the link to qualification frameworks would not optional information. This 'My Competence Data' approach should prefer competence points as a measure instead of time-based credits/credentials. It should be noted that ECVET allocates credit points to qualifications and not to short-term education and training programmes ([8]). However, there is no such possibility for commercial operators in Finland. They have to determine the scope of their training with other indicators than competence points, using, for example, the duration of training in days as a measure.

Some VET developers also argue it fundamentally that there is no potential for permeability between the ECVET and ECTS. The challenge is tangible in crediting microcredentials that form a shared constellation for different sectors of

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(7)   https://ec.europa.eu/education/resources-and-tools/the-european-credit-system-for-vocational-education-and-training-ecvet_en

(8) https://eurspace.eu/ecvet/pedagogicalkit/framework-for-the-attribution-of-ecvet-points/

education. For example, Competitive Skills (2021) offers a nation-wide badge constellation for technology enhanced problem-solving supporting all educational sectors. This means that some of these operators (e.g. liberal education) use ECTS and VET providers use ECVET for recognition. One example of contradictory yet to be solved is the pilot version of Competitive Skills badges (as in September 2021) refering to common units of vocational qualifications but suggesting the estimated workload also as ECTS. Also, some recent frameworks for trainees relate competence to all knowledge, skills and learning outcomes (Meunier and Sitanyiova, 2018, p. 28). However, Ryan et al. (2018) point out that 'achieving credit equivalency between ECVET and ECTS does not appear feasible, rather the evidence points to using a learning outcomes-based equivalency framework' (p. 600). In its final definition, the Competitive Skills working group will take into account what is instructed about microcredentials.

3.2.2.   Repositories for badge storage and sharing

My Studyinfo and the Koski database do not support digital open badges, due the current legislation (Kilja and Brauer, 2021). Badge earners transfer badges to a badge repository such as Open Badge Passport ([9]) for storage. In digital badges, the actual evidence can be contained in a certified document that lists the name of the badge earner, the achieved learning outcomes, the assessment method, the awarding body and, where applicable, the qualifications framework level and the credits gained. These portable microcredentials are owned by the learner. Badge earners may display and publish them using online services like LinkedIn or Facebook (Brauer and Ruhalahti, 2014). All these features are in line with the proposed definition (Andersen et al., 2020), but the challenge remains on the content compatibility with larger credentials or qualifications. Some projects, such as Competitive Skills (2021), seek to solve this confrontation problem by using national qualification frameworks and related international guidelines as the basis for competence criteria. A common vision is even more important in the context of education exports.

In general, Finnish badge developers seek to consolidate the constellations with detailed descriptions of targeted proficiency, assessment criteria and demonstration of competence (Brauer, 2019a; Korhonen et al., 2020). It is important to create and consolidate general rules for the use and development of multifaceted badges. The rules are needed not only for technical descriptions, but also for the content and metadata of badges (Brauer, 2020a). Thus, their value is real for a badge earner, an educational institution, and an employer to signify the

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(9) https://openbadgepassport.com/

achievement of a specific competence. Recently published reports suggested some guidelines regarding digital open badges as documentation related to VET reform (e.g. Oosi et al., 2020), and documentation related to reform on liberal education (e.g. Working group preparing for the identification and recognition of competences acquired through liberal education, 2020). Common European agreements would help to tackle the technical challenges faced in badge pilots, such as identification of the badge applicant or the authorisation and verification of the badge issuer and, enhance the quality assurance of the assessment criteria and the badge proceedings (MICROBOL, 2020). In addition, there is room to clarify the role of ePortfolios and alternative digital credentials; both methods with similar goals, such as making competences visible in digital format (Brauer and Korhonen, 2021).

In many cases, digital credentialing involves digital badging practices that reflect a complex understanding of the characteristics and specifications of digital open badges (Wolz et al., 2021). Digital badges are often synonymous with microcredentials (Lim et al., 2018; Rimland and Raish, 2019), smaller fractions of qualifications. Thus, badge development and implementation can also be linked to the revision of evaluation methods and reforms of European competence classification and transfer systems, such as ESCO (European Commission, 2020) and Europass (Cedefop, 2020). The new Europass will offer tools and information for learners, workers and job-seekers across the EU to manage their careers and studies. The new Europass will include also digital credentials: free tools and software for institutions to issue digital, tamper-proof qualifications and other learning credentials. Educational institutions in Finland have also been active in the development of Europass Digital Credentials Infrastructure (EDCI) e.g. University of Tampere is currently testing the technical infrastructure to create diplomas and certificates for students. Action three of the Digital Education Action plan 2021-2027 (EU, 2021) proposes the integration of digitally-signed qualifications in Europass. The EU Decision 2018/ 646 (Eur-lex, 2018) takes it further in Article 4(6) by specifying that 'Europass shall support authentication services for any digital documents or representations of information on skills and qualifications'. Finnish badge developers are eagerly expecting the option to pilot digital open badge integration of EDCI. Interviews with private training providers emphasised the particular importance of accumulating competences on the Europass international platform. In general, the interviewees emphasised the need for tools for competence mapping and to build and display competence profile, competence passport, and modern CVs. These tools should offer a smooth interface for verifying the competences acquired in different ways.

3.3. Can microcredentials be accumulated and combined with other qualifications?

The scoping review's first three main streams allow straightforward structures for accumulation and combination of microcredentials:

(a) microcredentials as short-cycle education and training;

(b) microcredentials as smaller fractions of competence;

(c) and microcredentials as credits in a digital format.

The Finnish interpretation of microcredentials allows directly accumulate achievements within vocational qualifications. Students can complete entire qualifications, parts of them or smaller units, or combine parts of different qualifications based on their needs (MINEDU, 2021c). In terms of microcredentialing, this unit structure allows flexible provision of short-cycle tertiary education and supports competence development as a continuum. Open UAS' are equally respected players in the field of short-term training providing studies consisting of UAS' degree programme provision. However, it should be noted that it is impossible to complete a degree at an open university, but completing studies at an open university, opens an option to apply a position as a degree student. Also, UAS Degree Students can select courses from another UAS free of charge and include these studies in their degree. Thus, open UASs also support accumulation of microcredentials e.g. allowing to combine a variety of study contents as optional studies into different degrees. In addition, both VET and UASs support the personalisation of studies with the possibility of validation/recognition of prior learning. The processes of VPL/RPL have been defined in Finland for both institutions clearly indicating the student how to proceed.

The fourth mainstream of digital open badges as microcredentials for learning and recognition is a slightly more complex and challenging given the current legislation and knowledge constructions regarding qualifications. 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. Badge constellations visualise the opportunities to customise studies to the achievement of personal goals (Brauer et al., 2017). On a flexible study path, personal customisation means providing the option to select badges from different badge families (Gamrat et al., 2016) and allowing earners to accumulate credentials from various sources (Casilli and Hickey, 2016). Moreover, families of connected badges form a badge constellation built from stacks or layers (Brauer et al., 2017).

Finns have already extensive experience of microcredentialing as a competence-based method that utilises digital open badges at different

educational sectors. Example from games industry (please see 2.9.2.) suggest a view from working life perspective ignoring degree structures and focusing only on competence. The National Initiative of Teacher's Badges (see 2.9.7.2.) displays all curricula of the Finnish Professional Teacher Education in one constellation. Key competence themes common to all educational sectors suggest also to build connected badge constellations, which enable the verification of competence as a trusted continuum from basic education to higher education. This has been one approach to the development in Competitive Skills (please see 2.9.4.) and Problem Solving I-II badge families (Brauer, Siklander et al, 2020) connecting to the theme of adults' problem-solving skills in technology-rich environments. These cases offer some good examples for anyone developing structures for accumulated competence.

An already identified challenge in the Finnish education system is how to validate digital open badges, and how digital open badges are valued in comparison to actual grades (Competitive Skills, 2021). Moreover, Competitive Skills-project emphasise the need to clarify how achievements assessed in accordance with the vocational qualification framework in liberal adult education could be directly validated as part of a vocational qualification. The informants of this study indicated that this is more than anything a matter of trust between the education sectors. The question remains how to increase trust without building strict guidelines and rules.

CHAPTER 4. Analysis of microcredentials and the added value for end users

There are many advantages to implementing microcredentials into educational structures. First, microcredentials serve the development of educational provision to meet evolving practices and competence requirements of modern working life. Second, microcredentials inform and promote the actual learning outcomes as digital credentials (ECTS credits, ECVET points) and offer to build technical settings for national digital learning ecosystems (life event approach). The technical definition of open interfaces allows to link national learning record stores to international repositories such as the New Europass-service. Third, microcredentials such as digital open badges may help educational institutions adopt the constructivist pedagogical paradigm and student-centred practices in a much easier and more sufficient way. Although, digital open badges are not conceptualised as microcredentials in Finland, they are part of the same process structure offering to visualise the proof of the learning outcomes, evidence of achieved competences and the updated development plan. As all these approaches are already being actively developed in Finland, the question arises something new that should be promoted in education and training?

4.1. Is there a need for microcredentials? Why do different stakeholders need microcredentials?

As a result, it should be noted that microcredentials enable flexibility, because they can be applied in diverse subject areas in the context of Finnish VET, both in career development and as part of vocational qualifications. The results of this case study indicate two consistent perspectives for active microcredential users:

(a) microcredentials represent the educational management a view on degree programs and new stackable degrees;

(b) digital open badges represent the student's view on the learning process and intended outcomes, proof of the learning outcomes.

Both discussions inform into how the competence-based learning process and assessment of acquired competences should be organised (Figure 10) in terms of 'input' and 'output' representing two sides of a same coin.

Figure 10. Different types of microcredentials are required for different purposes

Educational Institutions/
Educational Management Point of View

Micro-Credentials

Credits for qualifications
regulated by law

Industry Needs

Employer --- Employment --- Employer

Individual Needs

Digital Open Badges/
Alternative Credentials

Learner's Point of View

- short-cycle formal education and training
- smaller fractions of competence
- less than an vocational qualification unit
- more than single training day
- modular structure that allows individual study paths
- always relates on EQFs or NQFs
- supports VPL
- equals a grade, ECTS indication recommended
- credits for qualifications
- regulated by law

- inform and improve learning processes
- inform achieved competence
- allows recognition of competences acquired outside of formal education, validate competences in the working life
- smaller fractions than micro-credentials
- may represent highly specialised mastery (not part of EQF's or NQFs)
- ECTS indication optional
- option to attach evidence as a proof

Source: developed by an author.

Microcredentials suggest new tools for educational management to re-structure existing degree programs as short-cycle education and training that confers smaller fractions of competence supporting better provision for re- and upskilling. Further, the VET providers of the Microcredential Survey suggested to apply microcredentials in terms of validation and recognition of prior learning and to enhance basic employability skills for individuals. The introduction of microcredentials enables smoother transitions from liberal adult education to vocational education and training and further, to university studies. Digital open badges can be used to recognise individual's attainments in both non-formal and informal learning contexts as well as in the professional/vocational sector (Dyjur and Lindstrom, 2017). Also, Finnish national authorities emphasise the concept of microcredentials as a tool to develop short-term education and training.

Educational organisations are expected to issue digital open badges to learners who have earned microcredentials. The interviewees from both the education administration and educational institutions perceived competence-based approach and criteria-based badges as a natural way to verify competence, but in working life they were less known. Indeed, different groups of interviewees emphasised that working life actors also needed training in alternative digital credentials such as digital open badges. Yet the actors in working life saw the potential in employment and career-long development. The metadata contained in the digital open badge informs and verifies the earner's mastery. It includes data about the earner, issuing organisation, date issued, criteria to earn the credential, optionally credits (ECTS, ECVET) and contacts for supporting information.

Moreover, badges (see Open Badge Factory, 2021) allow to attach the evidence of actual and practical competence demonstration for the incentive. This information helps an employer understand the criteria met to earn the microcredential as well as the authority of the organisation issuing it. If a respected trade or professional association recommends the microcredential, it could make an even stronger impression. The badge constellation that allows to develop the competence of the entire work community and, ultimately, the resulting quality certificate could also be an entity of interest to working life.

As the research has demonstrated, both approaches, short-cycle education and training and digital open badges, are required to describe and develop modern education and training (updatable, adjustable, individual, personal, and flexible educational provision including validation of competences acquired at work). Employment happens at the cross-roads of these two views. As Trepule et al. (2021) point out 'considering the fact that digital badges may be integrated and travel within different platforms (Devedzic and Jovanovic, 2015), employers may easily reach relevant data from the digital badge metadata, thus facilitating employability processes' (p. 38). ePortfolios offer to share open badges and promote the option to build mini portfolios with open badges, but perspective to validate competences described on ePortfolios should be also emphasised. Brauer and Korhonen (2021) emphasise this option as one of the key questions when considering validation of competences acquired in working life. Trepule et al. (2021) argue that educational institutions and employers still hesitate to accept the value of microcredentials for certification. This is in line with the findings of this study that microcredentials and digital badges as a concept are still unknown to working life representatives. Therefore, it is easier for them to take a stand on, for example, on the development of short course offerings. Improved collaboration, co-learning and co-creation is required for efficient use of all types of microcredentials.

New digital solutions and supporting measures can ensure that the development of competence should become a natural part of work or entrepreneurship for more and more people (Finnish Government, 2020). When the contents of the work and the ways of doing work are changing, professional development should be equally flexible if we want to increase the employment rate. Digital open badges and related competence-based approaches will help educational institutions to develop not only workplace training but work-integrated pedagogy together with industry players (Brauer and Korhonen, 2021). Unique professional needs are emphasised in the badge development. The role of education organisers will also change when competence acquired in working life can be acknowledged. The development of best practices and a common

understanding of badging protocol are required to see how a competence-based approach and the opportunity to receive recognition for mastery and expertise regardless of the method of acquiring competence can affect continuous professional development (Brauer and Korhonen, 2021). Various groups of interviewees stressed the need to create a badge user guide and to provide information and training equally for educational administration, teaching staff, labour market actors and the end user of the incentive.

As a conclusion, we don't have one solution that meets the preliminary definition for microcredentials in EU (Andersen et al., 2020). Just in September, The Finnish Ministry of Education and The Ministry of Economic Affairs and Employment announced that they had set up a new working group to look at the competence perspective (MINEDU, 2021d). Another task force is organised to pounder microcredentials as smaller fractions of competence (Finnish Government, 2021a). Educational Management solutions are already viable, but they do not serve learner to a full extent. Moreover, a digital open badge is seen as a stand-alone format, a certified document that communicates both competence profiles (individual level) and competence maps (working life requirements). Key success factor is the feature that allows descriptions of the actual competence achieved in more detail and in a variety of extent. Digital open badges are a viable tool for profound pedagogical development and to implement learner-centred methods in education and training (Brauer, 2019a; O'Connor, 2014). The impact of digital open badge-driven learning on student's motivation is significant.

4.2. What are the main benefits / added value of microcredentials for end users (e.g. learners, education and training providers and employers)? What value do microcredentials bring to the overall qualifications system?

The level of education has an impact on securing a job in all OECD countries (OECD, 2020b). Educational institutions are encouraged to rethink approaches to learning and teaching and to modernise educational provision (EU, 2017). The OECD's recent report (2020a) assesses the current Finnish system of continuous learning, indicating some gaps in learning provision, including limited upskilling opportunities for adults with vocational qualifications and, more generally, limited availability of short-term training relevant to the labour market. Meanwhile, European Union promotes the provision of competence-oriented education, training and learning, establishing related good practices (EU, 2018a). Recently,

microcredentials have been promoted as the means to explore the introduction of short-cycle tertiary education in Finland (EDUFI, 2020; OECD, 2020a). Microcredentials support motivational pedagogical models and flexible learning opportunities, in addition to versatile and up to date course contents, to improve individual performance. But how microcredentials inform and promote the actual learning outcomes of short-cycle education and training?

The employers expect graduates to possess higher levels of learning, however they do not consider current transcripts, with the lists of titles, grades, and credits, useful in recruitment (Rhodes, 2012). Conventional credentials are not informative enough, as they lack some relevant information regarding courses, study type, assessment methods, grading and qualifications, and most important competences acquired (Trepule et al., 2021). Other measures and indicators are needed for more sophisticated and informative credentialing to adequately represent competences of an individual (Brauer, 2021; Trepule et al., 2021). Rhode's research (2012) also points out the need of making the results of assessment more public, also noting the role of accrediting bodies in promoting student's learning outcomes. Moreover, new technologies offer to capture student's learning and learning experiences throughout an educational career. Rhodes (2012) points out that ePortfolios and other competence descriptions may deepen students' learning and their understanding of their strengths and weaknesses. Technology that allows for the efficient and cost-effective identification and recognition of competences for external entities as evidence of student learning at the levels associated with quality performance is important and critical for both graduates and employers but also for the educational institutions in terms of pedagogical improvement (Rhodes, 2012).

Classical approaches might be appropriate in assessing technical knowledge and skills, but they might be less suitable for documenting professional competence (Sánchez Carracedo et al., 2018). Alternative credentials such as digital open badges offer new measures and support multifaceted tools such as ePortfolios to represent proficiency in a way that employers would recognize and understand applicants' full potential (Brauer and Korhonen, 2021). Badges may be difficult to earn, but they adequately represent learning (Abramovich, 2016). Assessments may include self-assessment, peer assessments, working life assessments and teachers' assessments of the path towards competences, in both face-to-face and online learning. The study path visualisation with badges provides an interface for personal customisation to meet individual occupational needs (Brauer and Korhonen, 2021). The process of instructional badging reflects an authentic performance scenario (Gunter and Mwaba, 2021) that is the demonstration of competence applied in the work setting or simulating working life

challenges. Tangible tasks include a requirement to apply the acquired skills and knowledge in practise to provide sufficient evidence and earn a badge (Brauer and Siklander, 2017). With competence-based digital badges the learning process is complex and multifaceted (Brauer et al., 2017) and provides inspiring challenges to engage the full potential of an individual. Relatively small assignments inspire studies regardless of time and place (Brauer, 2019a). Moreover, badges have potential to support recruitment and personnel planning, continuous learning and motivation in the world of work. Digital open badges encapsulate the individual learning experience and tie performance and achievement to documentation and evidence of learning (Ahn et al., 2014; Gamrat et al., 2016; Reid et al., 2015).

Although qualification frameworks are restored frequently, the updating of required competences should be flexible enough to respond to the rapid changes in society, and to meet new job opportunities like in the exceptional situation caused by the COVID-19 (Brauer, 2021). Digital open badges allow significant potential for variation as the badge constellation and the anatomy of the digital proof are not final decisions (Brauer, 2019a). A badge constellation may include different badge families from a variety of degrees with varying challenges. An important feature for all microcredentials is the option to review and adjust the contents in line with the industrial changes and progress of the educational setting. The badge-constellation of competences can also be focused to promote the identification and recognition of working life opportunities (needs of working life) while helping the individual to plan the development of competences (optional study paths) as a future professional (Brauer, 2019a). 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, and Pakanen, 2018).

Globally, the central idea behind the development of digital open badges is to provide equal opportunities for continuous learning (Open Recognition Alliance, 2020). The open badge repositories such as Open Badge Passport allows one to collect competences in formal, non-formal and informal settings. Skills and knowledge may be recognised in small fractions as well as in large sets. Previously acquired competence is important to the individual in the pedagogical process; when educational institutions increase their capacity to engage in the on-going assessment of competences, remarkable improvements can be achieved. When social and civic competence are taken into account in the design of badge criterion, and the material is produced linguistically clear, badges also respond to the educational policy goal of supporting immigrants and those with low basic skills. (Brauer and Korhonen, 2021)

4.3. Are microcredentials trusted among different stakeholders? What are the main reasons for trust / distrust in microcredentials? What are the conditions for ensuring the trust in microcredentials?

The aim of this case study was to characterise different aspects of microcredentials in the context of Finnish VET, both in career development and as part of vocational qualifications. The results indicate that provision of short-cycle courses is not a new idea but should and could be promoted extensively in education and training. The study findings deepen initial characterisation provided by microcredentialing task force (Finnish Government, 2021a) suggesting that advanced proceedings, alternative and additional documentation is needed to support workplace learning with smaller fractions of competence to inform and improve opportunities for lifelong learning. Microcredentials also inform and promote the actual learning outcomes as digital credentials (ECTS credits, ECVET points) and offer to build technical settings for (inter)national digital learning ecosystems. Moreover, digital open badges are required to communicate both desired and already achieved competences to different audiences.

4.3.1. The quality and relevance of competence descriptions

The interest in the competence-based approach has grown in recent years (Davies, 2017), even in terms of developing theoretical and technical pedagogical applications. 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 (EU, 2018b). Calls for clearly articulated learning outcomes (Costley 2001; Rhodes, 2012) have already started to reform educational provision. Mulder and Winterton (2017) describe developmental efforts in terms of 'continued confusion and diversity in approaches to competence' (p. 7) that complicates all efforts to design and implement coordinated policies. Neither the Bologna process or the EU legislation are fully integrated to educational planning or geo-politically congruent (Davies, 2017). Davies (2017) necessitates further the actions to enhance the clarity of terminology. Further frameworks should be developed for monitoring, organising, and assessing the broad range of competence-oriented education, training and learning (Brauer, 2021).

The New Skills Agenda for Europe has invited member States, social partners, industry, and other stakeholders to work together 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 (EU, 2018b). It is obvious to rely on a national qualifications system based on a commonly agreed European Qualifications Framework. In terms of microcredentialing, the Finnish unit structure that allows flexible provision of short-cycle tertiary education and training is also easily seen as reliable and trustworthy. The Finnish microcredential task force (Finnish Government, 2021a) has acknowledged the Koski database and Studyinfo.fi fundamental in the national service structure, but also set a requirement to develop additional portfolio tools for updatable competence profiles. Microcredentials play an essential role on this development both as a tool for lifelong learning but also as a tool for credit transferability. Moreover, the ability to communicate competences in different contexts and parties is emphasised. The interviewees of this study emphasised that awareness of digital open badges should be increased in working life. Whichever view on microcredentials we choose, it is the audiences that matter; work community, career development, more broadly working life, the educational sector, and public authorities (Brauer and Korhonen, 2021).

4.3.2. Quality criteria for assessment and validation

Microcredentials are a new frontier to many. It is important to establish quality criteria to support trust between organisations. Study findings indicate that it is central to the development of continuous learning to accredit the organisations that grant microcredentials, not, for example, the certification of individual badges, badge families or constellations. For instance, the challenge is when badges are granted e.g. in liberal adult education and they should be recognised also in VET (please see e.g. Competitive Skills, 2021). Learning pathways in general, should include fundamental collaboration between different stakeholders so that results of assessment and validation of acquired competences hold value and are highly recognised in society (Brauer, 2020b). Still, frameworks of knowledge provide differing interpretations of national and personal development (EU/EACEA/Eurydice, 2018). Validation pathways need to be modular, transparent and comprehensible at all stages of the process in order to allow flexible work and education pathways (3rd VPL Biennale, 2019). Digital open badges promote transparent learning processes, equal and egalitarian assessment and relevant learning (Brauer, Korhonen, and Siklander, 2018).

From the beginning, the challenges in developing competence-based open badges have been the quality and reliability of the microcredentials. The formulation of clear principles for interpretation is crucial. Different standards and frameworks applied (Kullaslahti et al., 2019) offer concise guidelines describing competence-criteria. However, the competence indicated by the digital open badge should be comprehensible in any context, at any time, without any other certificates attached but the evidence associated with the badge (Brauer and Korhonen, 2021). The badge metadata must describe the competence criteria in detail, explaining the required evidence in the form of a tangible, practical task to engage applicants' full potential (Brauer, Kettunen et al., 2018). The criteria required should inform the scale and challenge of the demonstration of competence and evidence required. Badge earners should be allowed to attach the evidence to the badge issued for future purposes as a 'work sample'. The creation of high-quality badges requires relevant pedagogical models and thorough instructional design (Brauer and Siklander, 2017). Clear and consistent, a complete design of meta-badges supports the visualisation of learning and summarises the accomplished achievements (Brauer and Siklander, 2017). Public recognition of different competences encourages people to use their knowledge and skills, to see new opportunities and to grow as experts (Halttunen et al., 2014). The outcome of the digital badging should for instance grant credits, allow for exemptions to shorten study time, lead to a full or partial qualification or open up new routes to education and work.

Digital open badges offer to promote information on how and why competences should be validated. In Finland national badge constellations are built to meet requirements of different frameworks such as DigComp (The European Digital Competence Framework) or National qualifications frameworks (NQFs), that classify qualifications by level, based on learning outcomes (see e.g. Competitive Skills, 2021). In addition to various frameworks supporting accreditation, the most important factor contributing to validation is still the detailed badge criterion and option to attach evidence as documentation that allows clear interpretation of a competence in question in different contexts. VPL should facilitate an individual's personal development and mobility horizontally, vertically and diagonally within and between organisations, sectors and/or countries (3rd VPL Biennale, 2019). 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. Training and certification of assessors is needed in order to ensure an open-minded, competent and non-discriminatory approach in assessment. In

addition to teachers and trainers, students also need more information about competence-based approach and guidance to use new solutions for learning and employment.

Digital open badges promote the development of digital ecosystems as credentials that allow open application programming interfaces (APIs). Since the solution is multifaceted, it is important to create and consolidate general and common rules to use and develop badges (Brauer and Korhonen, 2021). However, the rules are needed not only for technical development, but also for the content and metadata of the badges (Brauer, 2020). Thus, their value is real for both the badge earner, an educational institution, and a working life representative. Common European agreements should help to tackle the technical challenges faced in badge pilots, such as identification of the badge applicant or the authorisation and verification of the badge issuer, and enhance the quality assurance of the assessment criteria and the badge proceedings (MICROBOL, 2020). Laws and regulations need to be reviewed on a regular basis to allow the evolution of the microcredentials, digital open badging practices and VPL system (3rd VPL Biennale, 2019; Brauer, 2020b). If we want to create a new kind of excellence in continuous learning and flexible educational provision, we need a common will and political decision-making on structural reforms, and more research on competence-orientation, digital open badges and badge-driven learning in different educational sectors and working life.

4.3.3. Microcredentials that solve work-force challenges

The prevailing Finnish definitions of 'smaller fractions of competences' or 'microcredentials' does not contain the same idea of validation of learning outcomes as the original report of the European Commission Expert Group (Andersen et al., 2020), which would be relevant for many learners (Mäkelä and Alanko-Turunen, 2021). In the evolution of learning environments and revolution of educational structures, we face a phase where familiar systems collapse, and de-fragmentation seeks a full new form for education and training. It is time to seek common understanding and ground the structures to optimise flexibility so that those involved in working life, educational organisations, and the learners themself can each focus on what is relevant to them. A shared vision of Future Education and Skills (OECD, 2020) focus on 'an era characterised by a new explosion of scientific knowledge and a growing array of complex societal problems, it is appropriate that curricula should continue to evolve, perhaps in radical ways' (p. 3).

New technologies change both the nature of existing professional roles, and lead to the creation of new professions in several

sectors. New jobs and new ways of performing tasks are created all the time. At the same time jobs and tasks that are less competence intensive are disappearing (Thomson and Solsvik, 2020). In current working life, additional competences are needed to complement a vocational qualification, and employers are not willing to employ persons without a degree, nor without proven language skills. Moreover, the representatives of working life interviewed describe the strong need to make informal learning visible. They described the following uses as essential:

(a) identification and recognition of competences;
(b) raising the value of non-formal studies (e.g. language skills; ICT-skills);
(c) raising the value of informal, everyday learning;
(d) visualisation of informal learning;
    (i) for the employee to understand existing competences;
    (ii) for the employee to describe existing competences;
    (iii) for the employee to increase motivation for competence development;
    (iv) for the employee to enhance education-friendly attitude by sharing personal achievements/ seeing colleague's incentives;
    (v) for the employer to be able to utilise existing competences;
    (vi) for the employer to track and verify job orientation process and competence assurance e.g. occupational safety skills;
    (vii) for the employer to provide recognition on work-based learning;
    (viii) for the employer to review salaries as an incentive for (voluntary) professional development;
    (ix) for the employer to grant badges as awards for improved performance.
(e) employment without a full vocational qualification;
(f) in addition, badges can also support a person with a learning disability.

Microcredentials are developed with the idea that they should offer a way for professionals to acquire and demonstrate new skills and knowledge in the era of changing professions. Both employers and employees characterised the option to build an employee's individual account/personal portfolio as a key feature. Representatives of working life emphasised the portability of badges, that the content must be understood in different contexts. It was seen irrelevant whether they systematically corresponded to the qualifications system. However, it should be noted that some professions are regulated by law and these microcredentials should always connect to the NQF. Moreover, quality of different incentives must be assured. The current short-term course offer is already seen as diverse in terms of capacity and selection, e.g. liberal adult education, open UAS, VET unit structure, - instead, tools are needed in working life to make informal learning visible. However, some minimum requirements for the criteria should be defined to

ensure the coherence of the system. Ensuring minimum quality was seen as particularly important for private training providers. EDUFI was proposed to take responsibility for the quality criteria, especially when regards to the NQF should be noted. 'Computer Driving License' type trainings ([10]) were described as a successful implementation with recognised quality by both education administration and working life. Moreover, microcredentials were seen as beneficial for post-qualification rout to continuous education; further vocational qualifications, and specialist vocational qualifications. In these studies, students may also have heterogeneous backgrounds with extensive work experience and academic degrees to display. Organising time off for studies can be challenging in many ways for already employed persons, and therefore microcredentials representing smaller fractions of competence were seen as useful for professional development. However, continuous assessment is not for everyone, and especially employees with a lower level of education may find it distressing. One interviewee pointed out also that, learning opportunities of liberal adult education might be suitable for them, who are non-motivated for school-type of competence demonstrations. Assessment and certificates should not be always compulsory end-products of a training. Learning for pure joy is also needed.

The results of the Microcredential Survey address that the need for microcredentials will grow in the future. VET providers communicate that the microcredentials are trusted by learners to a large extent. Still, microcredentials and open badges are quite unknown in working life as a concept. The employers simply do not recognise microcredentials or the range of terminology feels somewhat confusing. The added value of microcredentials and open badges in relation to the current education system is ambiguous to both employers and employees. The most important thing in the development work is to move forward with the idea 'competence first'. Flexible structures are on demand, but working life is not ready for open recognition, where anyone can identify competence. The trade unions emphasise the role of education administration when employers are already developing their own, company-specific badge systems for job orientation and competence assurance. It seems that working life needs microcredentials tied to the vocational qualifications, but also less standardised digital open badges are on demand. For the sake of quality, all credentials should have uniform criteria for transversal competences that are required in all industries and all companies. Interviewees from education administration also felt that digital credentials are particularly suitable for recognising transversal competences. The key success factor is how competence descriptions serve individuals during their careers in

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(10) https://tieke.fi/en/services/osaamisen-kehittaminen/eskills-examinations/

terms of professional development and employment. Do all competences need to be formally recognised?

Both employers and trade unions emphasised that it is good that microcredentialing policies are being developed at EU level. However, it must be remembered that education policy is national and EU policies can also impede development by preventing already established good practices. Current vocational education practices in Finland are flexible, and the EU-level concepts should not be restrictive for national development in the future. National development work for the Finnish reform of continuous learning must continue beyond government terms and sufficient financial resources must be set aside for it.

4.3.4. The next steps in governance

The recent findings by The Finnish Education Evaluation Centre (FINEEC, 2021) study set a demand to communicate both existing and desired competence better with different stakeholders of personal career paths or staff enrichment. In September 2021, The Ministry of Economic Affairs and Employment and the Ministry of Education and Culture set up a task force to promote and guide the development of tools and procedures for identifying competences acquired in the workplace and outside the formal education system (Finnish Government, 2021b). The task includes the following:

(a) supporting the identification of competences acquired in the workplace and in non-formal education by expanding the frameworks for qualifications and other competence frameworks or by developing criteria-based digital open badges and other competence descriptions;

(b) proposing national principles for the identification of competences acquired at work and in non-formal education, in particular from the point of view of working life and employment;

(c) making proposals for pilots to be launched;

(d) supporting the adoption and dissemination of national principles;

(e) supporting the development of tools for in the national digital service structure of continuous learning.

By 31st December 2022, the task force will make a proposal for the possible extension of the qualifications framework and other competence frameworks, the development of digital open badges and other competence descriptions, and a proposal for national principles for identifying competences acquired at work and outside the formal education system. At the end of the term, the task force will submit its final proposals on national principles for identifying competences acquired in the workplace and in non-formal education based on experience gained from pilots and other national and international developments.

CHAPTER 5. Conclusions

To conclude, microcredentialing is quite recent as a stand-alone concept on national debates in Finland and it currently connects to the discussions of the national reform of continuous learning. This report examined microcredentials in more depth allowing categorising in Finnish context into four main streams as following:

(a) microcredentials as short-cycle education and training;

(b) microcredentials as smaller fractions of competence;

(c) microcredentials as credits in a digital format;

(d) digital open badges as microcredentials for learning and recognition.

Above all, microcredentials support the development of short-cycle education and training, and they are preferred as an administrative tool to develop educational provision. However, based on the interviews, an interpretation can be suggested that the microcredential is a sufficiently broad entity (e.g. 5-60 ECTS) that always corresponds to the grade. The interviewees of this study emphasised that centrally managed technical systems or European level guidelines should not be restrictive for national development in the future. Instead, a microcredential should be a criteria-based (not measured by time) competence description represented in a format that allows My data thinking ([11]) to empower individuals by improving their right to self-determination regarding their personal data.

Extensive short course provision is needed to support economic growth. Although training provision is already diverse, resourcing is one of the challenges to be addressed in VET and PHE particularly. Insufficient funding slows down the development of a short-cycle education and training that meets the needs of working life. In working life, vocational qualification units are experienced as too broad entities to support continuous professional development. As a result, companies have begun to design their own nano-courses, for example, nudge-learning at the workplace (Confederation of Finnish Industries, 2021).

The interviewees of this study on education administration stressed the importance of distinguishing learning opportunities from learning outcomes. Evidence of learning outcomes (credits and badges) were seen as secondary objectives of the development work. However, documents describing the proof of learning outcomes, the achieved competence, need to be developed for successful employment. The value of alternative digital credentials, such as open badges, is recognised in the context of Finnish VET, both in career development and as part

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(11) https://mydata.org/

of degree training. Digital open badges were seen as smaller competence descriptions that meet well unique individual needs for competence development and employment. Badge type of microcredentials are used to inform and promote the learning process and the actual learning outcomes for different stakeholders. However, the potential of these incentives for different sectors needs to be communicated further.

As a summary, there are both consistent and conflicting interpretations for different type of microcredentials that require profound and transparent development to build systems and practices of high quality. The term 'microcredential' itself remains vague in Finnish research and applied solutions. The linguistic confusion cannot be ignored in the developmental efforts.

List of abbreviations

API	Open Application Programming Interface
CV	Curriculum Vitae
ECTS	The European Credit Transfer and Accumulation System
ECVET	The European Credit System for Vocational Education and Training
EDUFI	The Finnish National Agency for Education
EHEA	European Higher Education Area
EQF	European Qualifications Framework
EURASHE	The European Association of Institutions in Higher Education
FiNQF	The Finnish National Framework for Qualifications
HE	Higher Education
ICT	Information Communications Technology
IT	Information Technology
LTD	A Form of Company Structure - A Private Limited Company
MINEDU	Ministry of Education and Culture in Finland
NGO	Non-Governmental Organisations
NQF	National Qualifications Framework
OECD	The Organisation for Economic Co-Operation and Development
PDP	Professional Development Programme
PHE	Professional Higher Education
RPL	Recognition of Prior Learning
SMEs	Small and Medium-Sized Enterprises
TELMA	Preparatory Education for Work and Independent Living
UAS	University of Applied Sciences
UNESCO	The United Nations Educational, Scientific and Cultural Organization
VALMA	Preparatory Education for Vocational Training
VET	Vocational Education and Training
VPL	Validation of Prior Learning

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SOSTRA - *Soft Skills Training and Recruitment of Adult Educators*

https://sostra.eu/

Annex 1.   A list of interviewees

In addition to desk research a set of interviews were conducted based on the general interview questionnaire provided by PPMI. The seven main topic areas were discussed:

(a) policy discussions around microcredentials;
(b) areas of greatest activity in the development and uptake of microcredentials;
(c) design and delivery of microcredentials;
(d) use and deployment of microcredentials;
(e) initiatives and research on microcredentials;
(f) links to qualifications system;
(g) added value for end users.

Participants represented the following:

(a) representatives of national authorities that are responsible for the governance of qualifications system and organisation and development of the vocational education and training;
(b) vocational education and training providers that are accredited or recognised to provide programmes leading to nationally recognised qualifications;
(c) liberal adult education and training providers that collaborate with VET in terms of continuous learning
(d) private providers (national, EU and global);
(e) organisations representing employees;
(f) confederations;
(g) industry representatives
(h) organisations representing apprentices.

A total of six interviews (n=) and six focus group interviews were organised in May, June and August 2021. Additional interview with IT-sector was organized in October 2021. Majority of the informants represented VET providers or Finnish Governmental authorities (managers, counsellors of education, senior advisors and project developers). In Finland, the national administration of education and training has a two-tier structure. The Ministry of Education and Culture (MINEDU) and the Finnish National Agency for Education (EDUFI) were both represented in the interviews. MINEDU is the highest authority and is responsible for all publicly funded education in Finland. The Ministry is responsible for preparing educational legislation, all necessary decisions and its share of the state budget for the Government. EDUFI is the national development agency responsible for early childhood education and care, pre-primary, basic, general and vocational upper secondary education as well as for liberal adult education and training.

Table 3.   **A list of interviewees**

No.	Name and surname of the interviewee	Type of interviewee (stakeholder group)	Country/region/sector	Date of the interview
1	Hanna-Maija Rantamäki	B (vocational education and training providers)	Finland/ South Ostrobothnia/VET institution, SEDU	28.5.2021
2	Marja-Terttu Viitala	B	Finland/ South Ostrobothnia/VET institution, SEDU	28.5.2021
3	Jaanamari Torniainen	B	Finland/ Uusimaa/ Omnia Joint Authority of Education in Espoo	28.5.2021
4	Minna Haasio	B	Finland/ South Ostrobothnia/VET institution, SEDU	28.5.2021
5	Maarit Hiltunen	B	Finland/ South Ostrobothnia/VET institution, OSAO	28.5.2021
6	Marianne Seppä	B	Finland/Western Uusimaa/ Municipal training and education consortium, Luksia.	28.5.2021
7	Valtteri Huhtahaara	B	Finland/ South Ostrobothnia/VET institution, OSAO	28.5.2021
8	Ester Rokka	B	Finland/Lahti Region/ Salpaus Further Education	28.5.2021
9	Riitta Vihunen	B	Finland/ Omnia Joint Authority of Education in Espoo	28.5.2021
10	Taru Koivisto	B	Finland/Southern Finland and Tavastia Proper/ Kiipula vocational college	28.5.2021
11	Riikka Lehto	B	Finland and Tavastia Proper/ Kiipula vocational college	28.5.2021

12	Säde Vikman	B	Finland/Lahti Region/ Salpaus Further Education	28.5.2021
13	Lotta Pakanen	C (liberal adult education and training providers)	Finland/ National/ Adult Education Provider Sivis Study Centre	15.6.2021
14	Merja Sjöblom	D (private providers)	Finland/National/TIEKE Finnish Information Society Development Centre	15.6.2021
15	Kaisa Honkonen	D	Finland/National/ The Association of Finnish eLearning Centre	15.6.2021
16	Niina Kesämaa	D	Finland/National/ The Association of Finnish eLearning Centre	15.6.2021
17	Piia Keihäs	D	Finland/National/ The Association of Finnish eLearning Centre	15.6.2021
18	Kirsi Coco	E (organisations representing employees)	Finland/National/Tehy - The Union of Health and Social Care and Early Childhood Education and Care Professionals in Finland	16.6.2021
19	Jonna Korhonen	A (national authority)	Finnish Ministry of Education and Culture	16.6.2021
20	Minna Taivassalo	A	Finnish National Agency for Education	18.6.2021
21	Inga Sihvo	A	Finnish National Agency for Education	18.6.2021
22	Ulla Kauppi	A	Finnish National Agency for Education	18.6.2021
23	Sami Mäkinen	A	Finnish National Agency for Education	18.6.2021
24	Mervi Jansson	D	Finland/Global/Omnia Education Partnerships	21.6.2021

25	Director general Petri Lempinen	A	Finnish Ministry of Education and Culture/ Department for General Upper Secondary Education and Vocational Education and Training	29.6.2021
26	Seija Rasku	A	Finnish Ministry of Education and Culture/ Department for General Upper Secondary Education and Vocational Education and Training	29.6.2021
27	Tiina Polo	A	Finnish Ministry of Education and Culture	29.6.2021
28	Ville Heinonen	A	Finnish Ministry of Education and Culture	29.6.2021
29	Riina Nousiainen	F (confederations)	Finland/National/STTK, confederation of trade unions	29.6.2021
30	Mirja Hannula	F	Finland/confederation of Finnish Industries	29.6.2021
31	Kirsi Rasinaho	F	The Central Organisation of Finnish Trade Unions	30.6.2021
32	Johanna Pessa	G (industry representatives)	Finland/European/K Group, Kesko retailing conglomerate	30.6.2021
33	Susanna Kärki	A	Finnish National Agency for Education	13.7.2021
34	Jouni Kyllönen	B, H (organisations representing apprentices)	Finland/National/ Taitotalo, vocational adult education centre	16.8.2021
35	Nuutti Manninen	B, H	Finland/National/ Taitotalo, vocational adult education centre	16.8.2021
36	Risto Korhonen	G	Finland/National/ IT sector	8.10.2021

37	Jukka Orava	G	Finland/Uusimaa/ Education Division, City of Helsinki	Email 8.9.2021
38	Tuija Laukkanen	A	Finnish National Agency for Education	Several emails
39	Seppo Hänninen	A	Finnish National Agency for Education	Several emails
40	Arja Sarkanen	G	Finland/International/Manufacturing	Email 5.11.2021