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# Designing together: collaborative approaches to online integration training for immigrants

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# DESIGNING TOGETHER: COLLABORATIVE APPROACHES TO ONLINE INTEGRATION TRAINING FOR IMMIGRANTS

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*To those who left this world, and to those who entered it.*

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## ABSTRACT

This dissertation explores collaborative approaches to designing online integration training for immigrants, emphasising the significance of co-design in creating inclusive and effective learning environments. These environments aim to support immigrants in acquiring language and cultural skills as well as employability competencies. The research is situated in the Finnish context, where integration training plays a crucial role in fostering immigrants' societal participation and employment opportunities.

The research is grounded in a design science research approach, which involves the creation, evaluation, and iterative development of educational artefacts that integrate technology as part of the learning process. The theoretical framework combines the TPACK model (Technological Pedagogical Content Knowledge) with a socioconstructivist learning perspective, emphasizing the integration of technology, pedagogy, and content knowledge alongside collaborative knowledge building. Central to the study is the examination of teachers' competencies as integration trainers and their role as part of an online community of practice for educational development.

The central research question was: *How to design fully online integration training based on the Finnish Act on the Integration of Immigrants?* The findings highlight the importance of learning communities, comprising teachers, learners, and educational developers, in driving innovation and fostering inclusivity in integration training. These communities provide a foundation for user-centered and culturally sensitive learning solutions while emphasizing digital accessibility and collaborative design processes. This research demonstrates how such approaches enhance the inclusiveness and sustainability of learning environments. The research presents a model that was co-developed in an authentic setting and demonstrates how online integration training can be designed to support learners with diverse backgrounds and needs.

The dissertation offers practical recommendations for educational developers, policymakers, and technology designers, emphasizing the importance of scalable and adaptable solutions for integration training in diverse learning contexts.

KEYWORDS: integration training, co-design, online learning, learning communities, educational technology

TURUN YLIOPISTO
Teknillinen tiedekunta
Tietotekniikan laitos
Tietojenkäsittelytiede
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## TIIVISTELMÄ

Tässä väitöskirjassa tarkastellaan yhteistyöhön perustuvia lähestymistapoja maahanmuuttajien verkossa toteutettavan kotoutumiskoulutuksen suunnittelussa. Tutkimus painottaa yhteissuunnittelun merkitystä osallistavien ja tehokkaiden oppimisympäristöjen kehittämisessä, jotka tukevat maahanmuuttajien kieli- ja kulttuuriosaamista sekä työelämävalmiuksia. Tutkimus sijoittuu Suomen kontekstiin, jossa kotoutumiskoulutus on keskeinen osa maahanmuuttajien yhteiskunnallista osallistumista ja työllistymistä.

Tutkimuksen lähtökohtana on design science research -lähestymistapa, jonka avulla luodaan, tutkitaan, arvioidaan ja kehitetään edelleen koulutusartefakteja, jotka hyödyntävät teknologiaa osana oppimista. Teoreettinen viitekehys perustuu TPACK-malliin (Technological Pedagogical Content Knowledge) ja sosiokonstruktivistiseen oppimiskäsitykseen. Tämä yhdistelmä korostaa teknologian, pedagogiikan ja sisällön integrointia sekä yhteisöllistä tiedonrakentelua. Keskeisessä roolissa ovat opettajien kompetenssit kotoutumiskouluttajina osana verkossa toimivaa koulutuksen kehittämisyhteisöä.

Tutkimuksen keskeiseksi tutkimuskysymykseksi muodostui: *Kuinka luoda täysin verkossa toteutettava kotoutumiskoulutus, joka tukee osallisuutta ja kotoutumista kotoutumislain ja opetussuunnitelman mukaisella tavalla?* Tulokset tuovat esiin oppivien yhteisöjen merkityksen koulutuksen kehittämisessä ja osallisuuden vahvistamisessa. Oppivat yhteisöt, jotka koostuvat opettajista, oppijoista ja koulutuksen kehittäjistä, tarjoavat perustan käyttäjälähtöisille ja kulttuurienvälisesti sensitiivisille oppimisratkaisuille. Lisäksi tutkimus korostaa digitaalisen saavutettavuuden ja yhteisöllisen suunnittelun merkitystä, koska nämä edistävät oppimisympäristöjen osallistavuutta ja kestävyyttä. Tutkimus esittää yhteiskehittämällä autenttisessa ympäristössä toteutetun mallin, miten kotoutumiskoulutusta verkossa voidaan muotoilla kaikenlaisille oppijoille.

Väitöskirja tarjoaa suosituksia koulutuksen kehittäjille, päätöksentekijöille ja teknologiakehittäjille, painottaen skaalautuvien ja joustavien ratkaisujen merkitystä kotoutumiskoulutuksen kehittämisessä monimuotoisissa oppimisympäristöissä.

ASIASANAT: kotoutumiskoulutus, yhteiskehittäminen, verkko-oppiminen, oppivat yhteisöt, koulutusteknologia

# Table of Contents

# Abbreviations

| | |
|---|---|
| **ADSR** | Action Design Science Research |
| **AR** | Action Research |
| **CEFR** | Common European Framework of Reference for Language |
| **CK / PK / TK** | Content / Pedagogical / Technological Knowledge |
| **DigComp** | Digital Competence Framework for Citizens |
| **DigCompEdu** | Digital Competence Framework for Educators |
| **DSR** | Design Science Research |
| **DSRM** | Design Science Research Method |
| **ELY** | The Centres for Economic Development, Transport and the Environment |
| **EntreComp** | Entrepreneurship Competence Framework |
| **EU** | European Union |
| **FNAE** | Finnish National Board of Education |
| **F2** | Finnish as a second language |
| **ICT** | Information and Communication Technology |
| **L2** | Second language |
| **MEAE** | Ministry of Employment and the Economy |
| **MIPEX** | Migrant Integration Policy Index |
| **NAO** | National Audit Office |
| **OECD** | Organisation for Economic Co-operation and Development |
| **OPAL** | The OPAL system is designed to provide information from feedback on workforce training and coaching to those procuring workforce training and to training providers. |
| **PCK** | Pedagogical Content Knowledge |
| **PISA** | Programme for International Student Assessment |
| **PMO** | Prime Minister Office |
| **TCK** | Technological Content Knowledge |
| **TE Office** | The Employment and Economic Development Offices |
| **TPACK** | Technological Pedagogical Content Knowledge |
| **TPK** | Technological Pedagogical Knowledge |
| **ZPD** | Zone of Proximal Development |

# List of Original Publications

This dissertation is based on the following original publications, which are referred to in the text by their Roman numerals:

I *Hartikainen A.*, Ahola M., Apiola M., & Sutinen E. The immigrant integration online training program in Finland, 2020. 43rd International Convention on Information, Communication and Electronic Technology (MIPRO), pp. 872-877

II Ahola, M. & *Hartikainen, A*. Lesson Learned of Tablet Course for Semi-literate Immigrants. 2022. In book Ahram, T., & Taiar, R. (Eds.). Human Interaction & Emerging Technologies (IHIET-AI 2022): Artificial Intelligence & Future Applications (Vol. 23). AHFE International.

III *Hartikainen A.*, Ahola M., & Sutinen E. Enhancing Teacher Training for Online Immigrant Integration Programs: A Design Science Approach. 2024. International Journal of Technology in Education (IJTE), 7(3), 493-512.

IV *Hartikainen A.*, Ahola M., & Sutinen E. Social impact of online teacher community on online immigrant integration training. 2024. The Turkish Online Journal of Educational Technology.

V Ahola, M., *Hartikainen, A.*, & Sutinen, E. Inclusion By Integration: Designing Online Training for New Immigrants as Future Workforce Contributors to Finnish Society. 2025. International Journal of Designs for Learning, 16(1), 58-78.



Anita Hartikainen has made significant contributions to all five articles through her expertise in research, methodology, and academic writing. In the first (I) article, she was responsible for the writing process, conducting background research, and applying the DSR method to the data. For the second (II) article, she focused on gathering background information and analysing the data. In the third (III) article, she played a comprehensive role, including overseeing the writing process,

collecting data, organising and conducting test situations, designing and conducting surveys, deepening theoretical understanding, formulating the methodology, analysing the data, and presenting the results. In the fourth (IV) article, she was responsible for collecting interview data, developing the theoretical and background frameworks, applying the methodology, and conducting the analysis. In the fifth (V) article, she equally shared responsibility for the writing process with the lead author and was also in charge of gathering background information, developing the research methodology, and analysing the data.

# 1 Introduction

## 1.1 Background and motivation

The integration of a migrant into a new homeland and society is a critical transition from an outsider to an insider. Given this, the question of how to arrange and steer integration is crucial, especially for many Western countries. Among the many processes inherent to integration, training plays a key role. In Finland, prior to the 2025 legislative reform, integration training was a statutory public service that promoted integration and employment. This training was offered to unemployed job seekers who had completed compulsory education and were registered with the Employment and Economic Development Office (TE Office). Training facilitated participants to improve their social, cultural, and everyday life skills (PMO, 2021) and was guided by a specific curriculum (FNAE, 2022; 2017; 2012). The Centres for Economic Development, Transport and the Environment (ELY Centers) procured training through competitive bidding from private providers, and training programmes were based on offers and contracts (NAO, 2018). Although there were no official qualification requirements for teachers, the ELY Centres required trainers to have a master's degree and pedagogical studies for subject teachers (Suomenopettajat ry.). Additionally, the financier may have required several years of work experience and various continuing education courses. However, since 2025, the responsibility for organizing training has shifted to municipalities and their associated employment areas with The Ministry of Economic Affairs and Employment providing ongoing supervision (MEAE, 2023).

In 2015, Finland took a significant step by commissioning its first integration training as an online implementation through the ELY Centres. The training was offered full-time and was designed to accommodate learners with zero language proficiency (Haikala, 2019; CEFR, 2001). This pioneering project was implemented in Lapland, where groups could not be formed due to the limited number of participants and the long distances that prevented participation in classroom training. As a result of this online delivery, integration training became accessible, even in sparsely populated areas. Moreover, the training also significantly increased access for women marking it as an innovative solution in the Finnish education sector.

Online training is becoming ubiquitous for different educational levels and fields. Given this, there has been a desire to offer it to increasingly diverse groups of learners. For example, online training has mainly been offered to immigrants aiming for expert jobs or to highly educated immigrants (Ruuskanen & Väänänen, 2022), who have already completed some Finnish language studies and demonstrate basic proficiency (CEFR, 2001). However, this research shows that in addition to the highly educated and expert immigrants, online training can also be designed effectively and accessibly for semi-literates and groups who have low educational levels.

Even if an immigrant has vocational or higher education from their home country, several factors can hinder access to the labour market. As a result, many work in so-called entry-level jobs, perceived as temporary solutions in low-wage sectors, and cannot find employment in their field of education (Ndomo & Lillie, 2023; Ojala et al., 2023). The major reasons for unemployment are lack of language skills, networks, and work experience (Alho, 2020), and immigrants also encounter discrimination in the Finnish labour market (Nshom, et al., 2022; Ahmad, 2019). Lower language skills can suffice for manual work, often emphasized in female-dominated sectors, such as caregiving and service occupations (PMO, 2021). However, access to expert positions often requires several years of language study and support services, such as degree recognition and supplementary studies processes. A wide range of expert professions require excellent Finnish or Swedish language skills and industry networks, making it extremely slow for highly-educated individuals to find employment in their field of education (Farashah et al., 2022; Alho, 2020). Moreover, learning Finnish language as part of integration training has represented a challenge for many migrants, where as little as 35% have reached the B1.1 target language level (CEFR, 2001) during their one-year integration training (NAO, 2018). This dissertation illustrates how designing online training can support language learning and promote employment.

My research applies the design science paradigm (Hevner, 2007; Peffers et al., 2007) to, first, co-design, implement, and evaluate an online integration training programme together with teachers and learners (the artefact), and, secondly, to investigatethe experiences of trainers in the designed online training programme. According to the curriculum, the teaching and guidance of integration training must be learner-centred and consider individual needs and abilities (FNAE, 2022; 2017; 2012). Since a new technology-mediated education design was intended to suit all kinds of learners, its design follows accessibility and inclusivity principles (Lomellini et al., 2022), which required the iterative collaborative redesign of the training (Papers I & V). The community's role as users and designers of the design took on entrepreneurial characteristics (Ho et al., 2020; Seikkula-Leino et al., 2010), making the teaching team unique and independent (V). This independence allowed for flexibility and innovation in implementation.

From 2015 to 2021, a total of 630 immigrants with widely varied language skills and other backgrounds participated in the online implementation (Haikala, 2019; Haikala & Kuja-Lipasti, 2021), highlighting the scope of this research and its applicability to all kinds of learners. This unique and extensive participant group makes this research a significant part of the development of Finnish integration training.

Teachers were engaged in the research by providing them with support in using technology and opportunities to participate in co-design processes. Their roles were clearly defined in collaboration with partners, and they were provided with autonomy to shape and develop the training. Learners were encouraged to participate actively in the training through continuous guidance and support, as well as accessible opportunities to provide feedback during the training. Based on the feedback and ideas collected from learners, new practices were introduced into the training.

This dissertation presents a student-centred digital learning design that considers dimensions of accessibility and promotes inclusion. My research describes online training as an artefact, examines the processes involved in its design, and defines the teacher's role as a key actor within this online training artefact. Integration in Finland is increasingly viewed as a multidirectional process that highlights both immigrants' participation and the society's openness and adaptability (Act on the Promotion of Immigrant Integration, 1386/2010; Act on the Promotion of Integration, 681/2023). As such, my research expands the view of the receiving society's role. This research and its findings can significantly impact the development and implementation of integration training. Online training has been perceived as a positive and sometimes the only possible solution to offer integration training and skills-based training, such as for special groups of highly-educated immigrants and sector-specific groups living far from central cities or in areas with poor public transport connections (Ruuskanen & Väänänen, 2022, 34; PMO, 2021, 79). This research presents practical and innovative solutions to the challenges of online integration training and aims to show that online learning can also promote the learning and integration goals of vulnerable groups.

## 1.2 Research Gap

In recent years, integration training for immigrants has attracted the interest of researchers in the fields of education and social sciences. To promote the evaluation and monitoring of integration training, the Ministry of Economic Affairs and Employment published two comprehensive collections of articles in 2019 and 2023. These publications provide information on, among other things, the importance of language skills to function in Finnish society, as well as on labour market inequality and structural discrimination (MEAE, 2019; 2023). Integration training has been studied from perspectives such as integration and language policy (e.g., Pöyhönen & Tarnanen, 2015; Pöyhönen et al., 2019) and the marketisation of education, which also

involves the changing role of the teacher (e.g., Kurki et al., 2018; Montonen & Lappalainen, 2017). Additionally, the development and learning of language skills have been researched (e.g., Huhta et al., 2017; Seppälä, 2022; Seppä & Ahlholm, 2024).

No prior studies exist on the online implementation of integration training in Finland; references to implementation can only be found in government publications (e.g., Ruuskanen & Väänänen, 2022; PMO, 2021). International research into the online implementation of second language (L2) training has been conducted in the Netherlands, including studies on L2 online training organised by Public Employment Services for adult job seekers (de Paepe et al., 2018).

Although the role of teachers in integration training has been somewhat studied (Montonen & Lappalainen, 2017; Seppälä, 2022; Huhta et al., 2017; Kurki et al., 2018; Masoud, 2024), their specific skills, experiences of a changed role, and new competencies in the context of integration training or online implementations have not been comprehensively addressed.

This research fills the gaps in existing studies and offers new perspectives and solutions that can significantly advance the development of integration training, regional inclusion, equality, and effectiveness. In my research, I focus on describing the digital design of integration training and the teacher's role as a pedagogue in a digital environment. My aim is to contribute to a better understanding of the competencies required of teachers as online instructors and to explore how impactful and effective online training can be designed in the context of integration.

## 1.3 Research Design and Questions

This dissertation can be situated within the field of information technology research, specifically technology-mediated interaction and design within educational technology. In the dissertation, I follow the design science research paradigm (DSR) (Hevner, 2007), which posits that each sub-study generates new knowledge. The foundations of the integration training curriculum (FNAE 2022; 2012; 2012) are based on a functional view of language (Dufva et al., 2011) and a socioconstructivist view of learning (Lantolf & Thorne, 2006), where learners autonomously build their knowledge collectively in interaction with their environment, i.e., other learners, teachers, and working-life actors, thus producing collective knowledge. By utilising the design science paradigm, practical design challenges can be solved (Peffers et al., 2006). The basis of my research is the design of a technological learning environment that emphasises interactive situations, and learners expanding their own and collective knowledge while studying the Finnish language, communication, and knowledge about Finnish working life and society.

Collaboration in an intercultural team is an effective way to develop social skills, problem-solving skills, and communication skills (Apiola & Sutinen, 2020). This

research is based on co-development, where design and learning are multidirectional: knowledge is transmitted from teachers to learners, but also equally from learners to teachers and the organisation's leadership.

The design science research paradigm makes visible the technological design of a socially or organisationally significant artefact, the influencing factors, and changes (Hevner et al., 2004). In line with the action research method, which aligns with the design science paradigm, I am responsible as both a teacher and a researcher, acting as an agent within the design process, allowing me to actively assess and address the situation (Peffers et al., 2007). As the guiding paradigm throughout the research, I have used the design science research (DSR) framework. In two of my articles (I and III), I also developed DSR as a standalone method, drawing on Peffers et al. (2007), who propose that DSR can function independently, without additional methods such as action research. To advance the DSRM methodology, I applied it as the primary approach in articles I and III, with action research supporting article II and content analysis supporting article IV.

When DSR studies produce and evaluate artefacts, they also generate new artefacts and meta-artefacts, which can inform us more about environmental issues or add new knowledge to the knowledge base (Iivari, 2015). In this study, a new meta-artefact emerged, containing practices and guidelines related to teacher training (III). Integrating these into teacher training or continuing education supports the professional development of teachers. Meta-artefacts help organise and systematise best practices (Iivari, 2003; 2015), which can be applied more broadly in different educational contexts.

The social sub-artefact (Leoz & Petter, 2018) refers to the technology-mediated social network that is formed by teachers and learners within the integration training online artefact. This network enables continuous interaction and information exchange, enhances the learning experience, supports a sense of community, and connects the network to the surrounding society, making it entrepreneurial. Studying the social network provides valuable insights into how technology can be utilised to support and strengthen social structures, particularly in the context of education.

Table 1 provides an overview of the publications, research questions, methods, and results of this dissertation. All of the research questions aim to investigate and determine how the technological design and co-development process of the training were carried out and evaluated, and how the development could be continued. Paper I describes the artefact formed by the training using a three-cycle model, which article V further details as a design case. Article V describes in detail the artefact and the iterative processes of its design versions 1-3. Article II describes a challenging design case, the design of online integration training for semi-literate learners receiving international protection. Article III involves teacher students who do not yet have experience in online teaching in the testing and evaluation of the design, exploring

their attitudes, thoughts, and experiences of the design, and developing new ideas for design improvement. Article IV interviews teachers who have taught in the design for at least two years to gain an understanding of how the social structure operating within the artefact is formed and how the design is developed collaboratively.

By researching design, I gain insights into how people interact through technology and what development requirements exist for technological solutions. The needs, wishes, and requirements are gathered from the users of the design, i.e., learners and teachers. The teacher's perspective in a similar context has not been studied. Teachers are key actors in the online implementation of integration training, and understanding their work is essential. This research opens the discussion on the online implementation of integration training, in which design is empathy-based and learner-centred. The user is always considered primarily over technology. The central research question was: *How to design fully online integration training based on the Finnish Act on the Integration of Immigrants?*

First, this dissertation examines the technological and pedagogical skills that teachers need for quality and effective online training. Additionally, essential competencies include language and cultural awareness and entrepreneurial skills. These themes are addressed especially in studies that explore the design of fully online integration training (Study I) and the formation of collaborative teacher communities (Study IV). Study IV investigates what kind of collaboration is required in online integration training and how entrepreneurial features contribute to professional social structures among teachers.

Secondly, the research focuses on teachers' experiences and perspectives on working in an online environment. It highlights a new perspective on integration training where teachers, collaborating remotely, explore approaches for ensuring that online training is more inclusive for all learners. This inclusivity considers not only learners' roles within the course and study group but also their interactions with their residential environments, workplaces, and leisure-language use settings. These perspectives are deepened in Study III, which investigates how student teachers experienced their involvement in the design process of integration training, and what kind of pedagogical and reflective insights emerged through their participation.

Thirdly, the research investigates how to design an inclusive online learning environment that supports immigrants' language learning and integration into society. The social impacts of online implementations, such as community building, networking, and employability strengthening, have been under-researched in integration training. This research addresses how online training can support social network formation and a sense of community among participants and teachers. These aims are central in Study V, which focuses on creating a fully online integration training model that supports inclusion and participation in Finnish society. Study I

also contributes to this question by evaluating how online training supports participants' language development, employment, and career pathways.

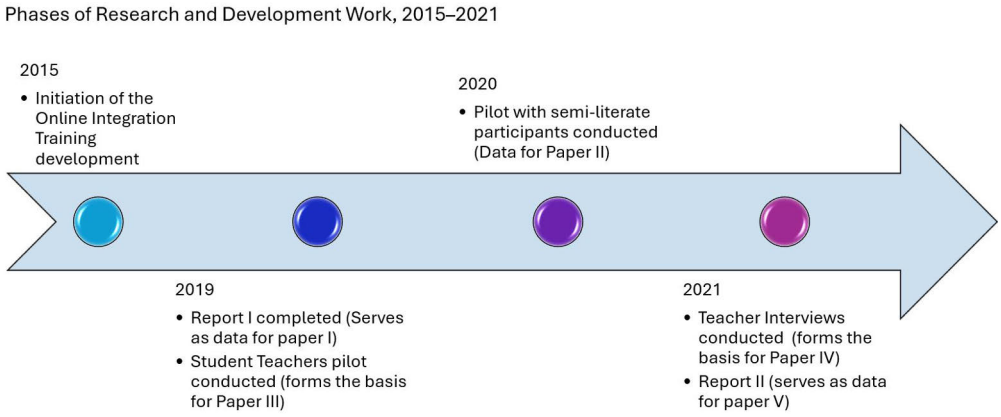
**Table 1.** The publications, research questions, methods, and results of this dissertation.

| Release | Research Question | Methodology | Outcome |
|---|---|---|---|
| **I. The immigrant integration online training program in Finland (2020)** | 1a. How to design fully online integration training based on the Finnish Act on the Integration of Immigrants?<br>1b. How well does the fully online integration training succeed in terms of participants' language level?<br>1c. How well does the fully online integration training succeed in terms of participants' employment?<br>1d. How well does the fully online integration training succeed in terms of participants' career pathways? | DSRM: Design Science research method | Three cycle view of the online implementation of immigrant integration training |
| **II. Lesson Learned of Tablet Course for Semi-literate Immigrants (2022)** | 2. How to produce an accessible and successful digital education service for semi-literate immigrants in Finland to promote integration and inclusion? | Case study; action research | Artefact: tablet-course design for semi-literates, feedback and evaluation |
| **III. Enhancing Teacher Training for Online Immigrant Integration (2024)** | 3. What experiences did student teachers have about participating in the design process? | DSRM, thematic analysis, questionnare | Meta-artefact: Student teachers feedback, evaluation |
| **IV. Social Impact of Collaborative Teacher Community in Online Immigrant Integration Training (2024)** | 4a. What is required for teachers' collaboration in online training promoting the integration of adult immigrants?<br>4b. How do entrepreneurial features contribute to the social structure of online teachers? | Qualitative content analysis, interviews | Social sub-artefact: Learning community and collaboration |
| **V. Inclusion by Integration: Designing Online Training for New Immigrants as Future Workforce Contributors to Finnish Society (2025)** | 5. How to create entirely online immigrant integration training that supports inclusion and integration? | Design Case | Design Case: Full description of the artefact and the design process |

Finally, the process and significance of co-development in designing integration training are explored. The study examines how learners and teachers can jointly develop the training's content and methods, and how this collaborative approach influences the quality of the training. Study II addresses this by focusing on how an accessible and functional digital course for semi-literate immigrants can be developed through iterative, feedback-driven design. It exemplifies how participation and responsiveness to learner needs can guide the development of inclusive digital education.

## 1.4 Structure of the thesis

This research follows a model consistent with the design science paradigm, focusing on the design of artefacts, co-design, and design processes. The research data was collected primarily between 2015 and 2019, with additional material gathered during 2020-2021. The papers were written between 2019 and 2024, although the development work and data collection were carried out in phases beginning earlier, from the onset of the training program.




Sub-studies commenced in 2020 and were partly based on workshops and development projects conducted during the data collection period. Some of the sub-studies rely on survey and interview data. The interviews and surveys are intended to complement observational materials as well as development materials and digital teaching and guidance resources produced during the design process. A more comprehensive description of the data, including the phases of data collection and the types of materials used, is presented in Chapter 4.1, *Data and Methods*.

The chapters of this thesis present and contextualise the environments in which integration training and trainers operate, and they also examine the design processes of the educational artifacts developed during the research. The various phases of these processes, along with selected observations drawn from them, constitute the core findings of this study.

Chapter 2 presents background information related to the environment of the artefact and the research literature on the current state of Finnish integration training, as well as the position of participants and teachers within it.

Chapter 3 provides essential background information and research literature related to the knowledge base of the artefact design. This chapter describes learning theories, competencies, and the frameworks of digital citizenship, teaching, and entrepreneurship.

Chapter 4 introduces the artefact of the research and the meta- and social sub-artefacts developed during the research. Additionally, it discusses how the artefacts have been developed and researched using the design process. The chapter also presents the design science method that has influenced the design of the sub-studies in this dissertation. This chapter also introduces the research data, its handling methods, and ethical principles.

Chapter 5 presents the results of the sub-studies. The results include a summary of the findings of the sub-studies, answers to the research questions, and reflections. The first subchapter, 5.1, discusses sub-studies I and III, which describe the artefact under study and its design process. Subchapter 5.2 summarizes the special design of the artefact aimed at semi-literate immigrants. Subchapter 5.3 discusses the outcome of sub-study IV, which involves the test use of the artefact in a teacher training institution and the resulting meta-artefact. Chapter 5.4 examines the work and internal dynamics of teachers operating within the artefact in terms of teacher collaboration.

Chapter 6 discusses the research results in relation to the background literature and the societal context. This chapter analyses the interpretation, explanations, and contradictions of the results. Additionally, it describes the limitations and constraints of the research. Finally, the chapter examines the research's relationship to and impact on practice, offering recommendations for the development of teacher training and online implementations.

Chapter 7 summarises and consolidates the answers to the research questions and presents ideas for future research topics.

## 1.5 Positioning Myself as a Learning Designer, Instructor, and Researcher

At the outset of this research, the online training model had already been in existence for over two years. The learning design was in constant flux because it was being based on co-creation principles. In this chapter, I will discuss my background, how I became as an online integration trainer, and subsequently, a researcher of the subject, and from what position I interpret the results.

I started as a teacher in the online implementation of integration training in early 2017. Having grown up as a user of IRC and other older social media, I easily understood the basic principles of online training, especially the requirement for interaction. At university, I had encountered online studying, which was based on independently producing texts in material bank-type learning environments. Even then, I wondered why online studying could not be implemented in a conversational, dynamic, and agile manner, functioning like IRC and social media. In the online implementation of the immigrant integration training, learners and teachers were in constant contact via chats, lessons were conducted in a "virtual classroom" using a videoconferencing application, and small group and pair work were based on video calls. Schedules and study assignments were published on websites. This felt like a natural operating environment for me. I felt at home when I found natural elements in my professional life things that had represented part of my routine in communication and social interaction for years.

I am a Finnish language teacher who worked as an online integration trainer from 2017 to 2019 and was so inspired by this forward-looking work that I wanted to generate new knowledge about it. I started working in the field in 2016. The attitude in the field and in research towards market-oriented integration training and the work of teachers was and often still is highly critical (see, e.g., OAJ, 2022; Kurki et al, 2018; Masoud, 2024; Montonen & Lappalainen, 2017). From the perspective of an integration trainer, it seemed important to make the development processes and the design of the training more transparent through research. Through design evaluation, key research questions emerged, such as the accessibility of training and the collaborative nature of teachers, which are generally seen as desirable ideals in research but are practically very difficult to implement, the former due to the rapid development of technology and lack of resources, and the latter because of the high level of autonomy Finnish teachers possess. In this dissertation, I examine the conditions under which online training was implemented and how technology-mediated teaching worked in practice.

Since my teenage years, I had struck up many friendships in online communities, so I was convinced that interactive teaching works well as long as users familiarise with the new mode of operation and get to know each other. A typical concern in

discussions among teachers was that one could not "truly meet" others online, despite the fact that numerous interactive channels were already widely used in many other fields, and online communication was extremely typical for example, among young people and the target group of this study, immigrants, who often maintain close contact with their families in their home countries. Because online teaching in educational institutions and universities had traditionally been text-centred and reliant on independent writing tasks, online learning was often understood as a solitary and self-directed activity rather than an interactive process. As a result, many in the field were sceptical about teaching functional Finnish interactively online, doubting whether spoken language skills could be effectively learned in an online environment. Success in this was considered magical, even though videoconferences and group calls were becoming increasingly common in the workplace. The question was: how should technological tools be utilised pedagogically and in a way that promotes collaboration?

I conducted this research because I firmly believe that genuine interactions and encounters can happen online through video, audio, and chat connections. Working in a teacher community that operated online reinforced this belief. The community had a unique open and positive team spirit, fostering innovations, friendships, and close collegial relationships. It is important to generate research data on how to enhance interactivity and community-building activities online and to identify the technological design solutions that are suitable for such an educational ecosystem.

The research questions took shape step by step. Initially, I examined how training is constructed as a technological artefact and identified the factors influencing the success of implementation (indicators). Entrepreneurship came into the picture when I critically analyzed teachers' self-efficacy and collaboration. In 2019, I moved to work in higher education, developing services for highly educated immigrants as a career counsellor and trainer. This broadened my perspective and allowed me to research educational design from a distance.

The Covid-19 period forced me to take a break from the research. After the exceptional period, when the concepts and practices of online learning spread widely across the educational field and became part of everyday discussion, I made significant progress with my research. The perspective and the community forming the basis of my research had to be reassessed. The pandemic familiarised a broad range of teachers with online training. However, it also caused a multitude of negative experiences and poor practices in Finland due to the rapid transition to online without adequate planning or experience. I no longer pondered how to convince others to accept online teaching and recognize its interactive nature. Now, I considered how to disseminate research knowledge about positive learning and teaching experiences online, the design of interaction, and the implementation

methods of quality online training. My research shows that integration-promoting training can be conducted online with quality when the infrastructure and ecosystem are built carefully. The design of the "Integration Training Online" artefact began in 2015 and was developed over several years without the digital leap forced by the pandemic, making this research unique.

In Chapter 2, I outline the organization of integration training in Finland and examine in greater detail the role of the integration trainer.

# 2 Environment and Social Context

This chapter presents key environmental factors that play a major role in the design process and therefore must be understood. According to the Design Science Research (DSR) paradigm, the relevant cycles of research address the effects of the environment (relevance cycle) and the role of the knowledge base (rigour cycle) in the development of the design. These cycles are continuous and dynamic, and changes that arise must be accounted for in the next design iteration (Hevner et al., 2004).

The environmental factors affecting the design of the online integration training artefact include people, organisations, the technology in use, and the challenges created by the environment. These challenges include long distances, unequal learning opportunities in different living environments, and the shortcomings in organizing online and integration training (I, IV).

In this research, I refer to the participants of the integration training as "learners" and the integration trainers as "teachers." These terms do not refer to the stage of learning or the qualifications of the teachers.

## 2.1 Integration Act and Common Practices

This subchapter provides an overview of the legislative and administrative framework that governs integration training in Finland. It outlines how integration training is defined and implemented in practice, the role of different authorities in organizing it, and the structural conditions that shape its delivery. The section also examines the goals of integration training, its pedagogical structure, and the broader societal aims embedded in the Finnish model of integration. These insights form a necessary contextual basis for understanding the environment in which the design processes and the empirical work for this research have taken place.

### 2.1.1 Legal and Organisational Framework of Integration Training

In Finland, integration training for adult immigrants is work-oriented training that covers language and communication studies, as well as skills related to working life

and societal participation (FNAE, 2022; 2017; 2012). The goal of integration training is to support transitions into employment and other measures and services that promote employment (PMO, 2021, 79). Integration training is labour market-oriented and organized based on the Act on the Promotion of Immigrant Integration, which sets the legislative framework and goals for integrating immigrants into Finnish society. According to the Integration Act, unemployed immigrants have the right to an integration plan, and after its preparation, they can participate in services promoting integration, such as integration training (Act on the Promotion of Immigrant Integration, 1386/2010). The Employment and Economic Development Office (TE Office) directs unemployed immigrants to these training programmes. The training is free and aimed at all immigrants who need employment-promoting language training, not just refugees as in Sweden (Celik et al., 2020) and many other countries. When the comprehensive reform of the Integration Act comes into effect in 2025, municipalities will be responsible for organising integration training programs and other integration-promoting measures (Act on the Promotion of Integration, 681/2023).

Until the end of 2024, Finland was divided into ELY regions, and the ELY Centre, operating under the Ministry of Economic Affairs and Employment (MEAE), procured services regionally from private companies. The implementations ordered by the ELY Centres enforced strict conditions for organising the training. According to the law (Act on the Promotion of Immigrant Integration, 1386/2010) arranging integration training is mandatory. During the period 2015-2021, when the data for this research was collected, the practice was that the state authority tendered training programs from training service providers, with various providers participating in competitive bidding (PMO, 2021). The criteria for the tender were the best offered price-quality ratio. The ELY Centres and the Ministry of Economic Affairs and Employment supervised the quality of the training (PMO, 2021; Ruuskanen & Väänänen, 2022). However, the tenders have been criticised for driving down prices, which can affect the availability of teachers, increase the workload of teachers working in companies, and make long-term development work inadequate (OAJ, 2022).

The goal of integration training is to provide immigrants with the necessary language, cultural, and communication skills, as well as professional competencies, that enable active participation in the digital society and working life. Legislation requires that the training be accessible and equal throughout Finland (Act on the Promotion of Immigrant Integration, 1386/2010; FNAE 2022; 2017; 2012). Participation in the training is mandatory for unemployed jobseekers whose integration or employment plan includes it, as defined in the Act on the Promotion of Immigrant Integration (1386/2010). Not starting or discontinuing the training without an acceptable reason may lead to the loss of unemployment benefits due to

non-compliance with the plan. In practice, it is often the only opportunity for unemployed foreign-speaking adults to access free language instruction during their integration period (Ronkainen & Suni, 2019).

During the period of this research, the curriculum guidelines for integration training (FNAE, 2012) and the updated implementation models for integration training in 2017 (FNAE, 2017) were in force. Integration training is divided into modules and, in terms of scope, corresponds to full-time studies lasting up to about one year. According to the curriculum in force from 2015-2021, learning was organised five days a week, with 7.5 hours of contact teaching per day, of which 2-2.5 hours could be guided independent study (FNAE, 2017; 2012). In the online implementation, contact teaching must be largely synchronous, meaning real-time through video conferencing, group calls, or individually guided chat, so that all learners are in close interaction with the teacher and other learners throughout the study day. This also makes it possible to monitor attendance and continuously assess competence.

The training is mainly conducted in Finnish, and an auxiliary language is often not available. When meta-language for explaining cannot be used, a functional approach is favoured in L2 teaching, such as ready-made phrases and tasks that model the world beyond the classroom environment (Seppä & Ahlholm, 2024). Teachers can use auxiliary languages according to their own skills, but this is generally not required because there are no resources for planning foreign-language teaching.

### 2.1.2 Indicators and Criticism of Integration Training

When it comes to human rights and equality, in international comparisons, Finnish integration training has been recognised among the best (see MIPEX, 2020), but there is little comparable research data on its effectiveness (Ronkainen & Suni, 2019). Indicators measuring the success of integration training include the development of language skills, subsequent placement (study or job placement after training), and official feedback collected through the OPAL feedback system. However, it has been noted that these indicators do not provide a sufficiently comprehensive picture of the success of integration training, as they consider successful integration only in terms of achieving language proficiency goals and employment (Ruuskanen & Väänänen, 2022). Collecting consistent follow-up data is challenging in the short term and especially in the long term, as individuals are not obliged to report their employment status or other activities to authorities. Based on these indicators, integration training has consistently failed to achieve both the target language proficiency level and the goal of increasing employment rates (see, e.g., Huhta et al., 2017; Owal Group, 2018; VTV, 2018).

Online training lacks its own indicators, so the perception of the success, quality, and impact of online training is largely produced by the internal evaluation of the service provider and the individual evaluation of the employment administration. The general perception is that online study is mainly suitable for highly educated individuals and those in professional occupations (Ruuskanen & Väänänen, 2022). My research challenges this view.

## 2.2 Participation in Integration Training

In the online integration training from 2015 to 2021, there were a total of 630 learners distributed across a wide geographical area covering 191 municipalities in Finland, from Northern Lapland to the southern archipelago. The most common native languages of the participants were Russian, Arabic, and Thai (Haikala, 2019; Haikala & Kuja-Lipasti, 2021). Learners typically came from small municipalities and villages where there was no opportunity to participate in classroom-based integration training. There were also learners from cities, often those who needed integration training urgently but for whom no suitable classroom-based course was about to start. Learners could flexibly transition from the courses to the workforce or switch to a more suitable integration service if one was available.

Finland has two official languages, Finnish and Swedish. About 5% of the population speaks Swedish as their native language. Integration training is provided in Swedish in Swedish-speaking municipalities, but the majority of the training is conducted in Finnish. In 2023, 16,200 people participated in integration training (Ruuskanen, 2024). In 2022, 50.6% of foreign-born individuals with foreign backgrounds had completed higher education degrees (Integration Indicators Database, 2024), which is slightly higher than the entire Finnish population, of which 42.3% had completed higher education in 2021 (PMO, 2022).

In recent years, immigration has been driven by work and study-based applications, with an increase also seen in residence permit applications for family members (Finnish Immigration Service, 2023). Family members, refugees, and other immigrants are entitled to free integration training if the immigrant has registered as an unemployed job seeker with the TE Office.

Recently, the employment rate of immigrants has risen rapidly above the EU average of 69% across 27 countries. In Finland, the employment rate of immigrants was 73.4% in 2022, compared to 72.4% in Sweden. The employment rate for immigrant men is the same as in comparison countries, while the employment rate for immigrant women is higher than the EU average. Compared to previous years employment is more often in non-standard forms, such as temporary and part-time jobs, as well as agency and platform economy work, compared to other types of employment (Statistics Finland, 2023).

**Figure 1.** Residence municipalities of participants in the online integration training on the map. (Haikala & Kuja-Lipasti, 2021)

Immigrants face a multitude of challenges in the integration process. Society and political practices have placed many expectations and goals on them (Ronkainen & Suni, 2019; Masoud, 2024). Background variables affecting language learning include the learners' native languages, target language proficiency level, learning perceptions, educational background, previous language studies, culture, external support for education, motivation, and personal goals (e.g., Seppä & Ahlholm, 2024; Ronkainen & Suni, 2019; Seppälä, 2022). Some immigrants are highly educated, while others may have limited formal education. The needs for language use vary greatly across different fields, professions, and life situations (Pöyhönen et al., 2019). Learners often do not know how to learn a language outside the classroom (Seppä & Ahlholm, 2024; Suni & Tammelin-Laine, 2020). Training providers and designers must have a deep understanding of the challenges immigrants face and how to address them to ensure that online training is high-quality and effective (Yu et al., 2019).

## 2.3 Teachers as Integration Trainers

This section examines the role of teachers in integration training, focusing on their professional responsibilities, qualifications, and the challenges they face in practice. Teachers in integration training operate in a complex and evolving context that demands not only language pedagogy but also social, cultural, and technological adaptability. This broader professional landscape informs how teachers perceive their role and how their work contributes to learners' integration into Finnish society.

### 2.3.1 The Changing Role of the Teacher

Teachers play a crucial role in the integration training of immigrants. Finnish language teachers hold a central position as language instructors, transmitters of the language community's practices, and socialisers into the new language (Seppä & Ahlholm, 2024). Their task is to provide instruction that helps immigrants achieve sufficient language and communication skills, as well as the skills needed in Finnish work culture and society. Teachers guide learners towards active participation and integration into Finnish society (FNAE 2022; 2017; 2012).

Previously, the role of teachers in Finnish integration training has been studied from the perspective of neoliberal governance and the marketisation of education, based on Foucault's research on power relations (e.g., Foucault, 1991), which also involves the changing role of teachers (e.g. Kurki et al., 2018; Montonen & Lappalainen, 2017). These research studies highlight that training is organised based on competitive bidding and employment relationships are insecure, affecting workers' perception of themselves and their work. Teachers are expected to transform into "consultant-like" project workers within companies, and teachers involved in studies have expressed concern about their profession and professional identity (Kurki et al., 2018; Montonen & Lappalainen, 2017). The perspective of this research rests upon the evolving role of teachers and focuses on technological-pedagogical skills and an entrepreneurial mindset (IV).

### 2.3.2 Teacher Qualifications

In Finland, those training to become mother tongue and literature teachers and Finnish as a Second Language (F2) teachers complete a master's program and comprehensive (60 ECTS) pedagogical studies for teachers. Graduates are qualified to work as Finnish language teachers not only at the basic and secondary levels but also in adult education. In labour market-oriented integration training, there are no specific qualification requirements for teachers, but in practice, the ELY Centre requires an advanced degree, subject studies, and pedagogical qualifications. Work experience can sometimes compensate for missing studies (Finnish Teachers,

5.7.2024). Subject teacher training at teacher education institutions emphasises teaching mother tongue and literature, and teaching practice periods are conducted in university-owned normal schools that serve as comprehensive training schools for supervised teacher education. Adult learners may not be encountered at all during teaching practice, and perspectives on L2 teaching and labour market-oriented training are often superficial. Because pedagogical training rarely covers adult learners or L2 instruction, this creates an additional challenge for integration training teachers, who are required to demonstrate resilience, creativity, adaptability, and a capacity for self-directed learning. They must often develop and co-create pedagogical approaches on the go, adapting as the training progresses. This is a significant factor in the social and pedagogical context of their work.

A sizable number of mother tongue teachers end up working as L2 teachers. Exact numbers are unknown because data on teacher employment is not systematically collected in Finland. An estimate of the teaching staff in four ELY Centre regions was just over 450 in 2022 (Ruuskanen & Väänänen, 2022), but the actual number is higher since there are 15 ELY Centre regions. Integration training is conducted not only in classroom settings but also entirely online or as blended learning (PMO, 2021, 79), so teachers should be prepared to design, implement, and develop online teaching. A comprehensive survey on the state of L2 teaching in Finland at different educational levels found that, in addition to a lack of resources, there are challenges in recruiting qualified L2 teachers. The need for additional and continuing education has been recognised at all educational levels (Owal Group, 2022).

### 2.3.3 Challenges Faced by Teachers in Integration Training

Teachers face several challenges in integration training. Learner groups are heterogeneous in background (see Haikala, 2019; Haikala & Kuja-Lipasti, 2021), so differentiation, such as tasks at different levels and organising suitable small groups, is continuously needed. Additionally, the use of digital technology in teaching is an essential part of teachers' work. There is evidence that new teachers lack sufficient training in the pedagogical use of ICT, while older teachers may lack the technical knowledge to use ICT for learning. Competence and experience influence the willingness to use ICT (OECD, 2021, 34). Working in a culturally diverse environment also requires the ability to understand and consider learners' individual backgrounds and needs (Seppä & Ahlholm, 2024).

Teachers are crucial in promoting integration. They not only teach language and communication skills but also help learners understand and adopt Finnish societal norms and cultural practices (FNAE, 2012, 25). Integration training primarily aims to promote professional competencies (Act on Public Employment Service

1526/2009, 1 §), so achieving individual learning goals should lead to employment or significantly advance learners' career plans.

Teachers support learners in employment and work closely with labour administration and labour market actors (FNAE, 2012, 15). They are also responsible for drafting follow-up plans for participants in integration training (FNAE, 2012, 8). They help learners find study or job opportunities after integration training, or guide them to other activities and help them develop a career plan.

To support teachers, it is important to provide ongoing professional development support and continuing education, particularly in digital technology and L2 teaching. The Finnish National Agency for Education funds continuing education for teachers, but only teachers working in institutions providing basic education, vocational education, or liberal adult education can participate (Ruuskanen & Väänänen, 2022, 26), leaving integration trainers working in companies outside these continuing education opportunities. Some companies have organised training for their staff, and a survey (Ruuskanen & Väänänen, 2022) showed that teachers are generally satisfied with the availability of continuing education.

In summary, the social-pedagogical context of integration training in Finland places unique demands on teachers, who serve not only as language instructors but also as cultural mediators, guiding learners toward active participation in Finnish society. The heterogeneity of learner backgrounds, the integration of digital tools, and the need to navigate a rapidly changing employment landscape all contribute to the complexity of their roles.

The structural challenges related to employment, the limited focus on adult and L2 pedagogy in teacher training, and the scarcity of accessible professional development opportunities further highlight the resilience, adaptability, and innovation required of teachers in this field. These contextual factors emphasise the importance of a supportive design environment that can foster the development of pedagogical strategies tailored to the needs of integration training.

In the following chapter, we will delve deeper into the knowledge base on which integration training, teacher competencies and skills, as well as technological-pedagogical expertise, are founded.

# 3 Building a Knowledge Base for Technological Pedagogical Content Knowledge

This chapter introduces the theoretical and conceptual foundations that guided the design and implementation of the online integration training developed in this study. The knowledge base is built on multiple sources, including scientific literature, policy documents, national and EU-level frameworks, curricular guidelines, and the practical expertise of those involved in the development process. These diverse sources form the basis for understanding the pedagogical and technological decisions made during the design of the training artefact.

The chapter is structured around the framework of Technological Pedagogical Content Knowledge (TPACK), which provides a comprehensive model for examining the integration of technology, pedagogy, and subject content in teaching. The TPACK framework offers a systematic approach to understanding the types of teacher knowledge required to design effective and inclusive digital learning environments. By organizing the chapter according to the three core domains of TPACK—Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK)—it becomes possible to explore each knowledge domain individually and in relation to the design challenges and needs of integration training.

The selection of these particular knowledge areas is based on their relevance to the research aim: to design a pedagogically sound and technologically accessible model for online integration training that promotes inclusion and supports learners with diverse educational and linguistic backgrounds. The chapter also highlights how the design principles were grounded in empathy-based and inclusive pedagogical approaches, which are essential for addressing the challenges of equity, accessibility, and learner engagement in the context of adult integration training.

The knowledge base guiding the design process consists of scientific studies, political strategies, EU guiding frameworks, curricula, as well as the experiences and expertise of individuals involved in the design process. Additionally, the artefacts developed during this research and, particularly, the peer-reviewed articles, which are discussed in more detail in Chapter 5, are also included in the knowledge base.

The Technological Pedagogical and Content Knowledge (TPACK) model was developed based on socioconstructivist thinking, As a theoretical model, TPACK encompasses the domains and combinations of thinking when discussing technological pedagogical solutions (Mishra & Koehler, 2006). This model emphasises that effective teaching practice using technology requires an understanding of how technology, pedagogy, and content knowledge integrate and support each other. In designing the online integration training artefact, the model provides an effective framework for planning the opportunities teachers have to act as educators and create interactive situations that enable learning for all through remote connections.

Using the TPACK framework, teachers can design and implement instruction that is both technologically and pedagogically meaningful. In the online implementation of integration training, technology is designed to have a mediating role within and between the teachers' professional community, the working environment, and the learners' learning environment. The framework helps teachers understand how technology can be used to support teaching and how technological tools can enrich the learning experience.

A visual model illustrating the three domains of the TPACK framework (technology, pedagogy, and content) and their intersections can help clarify the concept. This model assists teachers in seeing how the different domains relate to each other and how they can be utilised in instructional design. According to the Technological Pedagogical Content Knowledge (TPACK) framework, teachers' knowledge consists of the following areas:

1. Content Knowledge (CK): Mastery of the subject matter that is being taught.
2. Pedagogical Knowledge (PK): Understanding of teaching methods and educational practices.
3. Technological Knowledge (TK): Proficiency in using various technologies.
4. Pedagogical Content Knowledge (PCK): Knowledge of how to teach specific content effectively.
5. Technological Content Knowledge (TCK): Understanding how technology can be integrated into the subject matter.
6. Technological Pedagogical Knowledge (TPK): Knowledge of how to use technology in teaching methods.
7. Technological Pedagogical Content Knowledge (TPACK): The combination of all these knowledge areas to effectively integrate technology in teaching specific content.

This chapter is divided according to TPACK categories into Technological Knowledge (TK), Pedagogical Knowledge (PK) and Content Knowledge (CK).

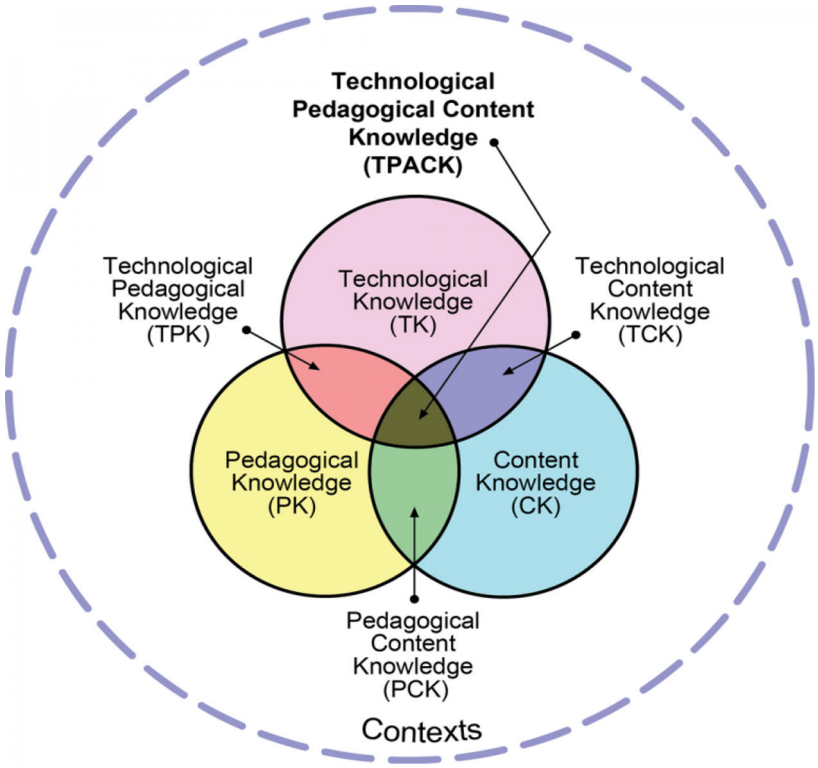



**Figure 2.** Technological Pedagogical Content Knowledge (TPACK) framework. Reproduced from TPACK.org (© 2012 by tpack.org). Used with permission under rights-free terms provided by TPACK.org.

## 3.1 Technological Knowledge (TK)

This section focuses on the technological dimension of the TPACK framework, which is a central tenet in the context of online integration training. Technological knowledge refers not only to the ability to operate digital tools, but more broadly to an educator's capacity to select, apply, and adapt digital technologies in pedagogically meaningful ways. In integration training, this competence becomes especially relevant, as digital environments are the primary arenas for instruction, interaction, and learner engagement.

The chapter discusses how technology functions as a mediating tool in online education and explores design principles that support accessibility, inclusion, and learner agency. Special emphasis is placed on empathy-based design and the creation of a sense of belonging, which are critical for engaging diverse learners, many of

whom may have limited experience with digital tools or formal education. In addition, the chapter highlights key policy frameworks that define and support the development of digital competence among educators and learners, especially those published by the European Union.

By analysing both theoretical and practical perspectives on technological knowledge, this section outlines the foundations for designing digital learning environments that functional as well as socially and pedagogically sustainable in the context of integration.

### 3.1.1 Empathy-Based Design

Unconditional Positive Regard (UPR) is a concept applied in education as an attitude where teachers show acceptance and appreciation for all students, regardless of their background or performance. This approach has been found to improve students' self-esteem, motivation, and learning outcomes by creating a safe and supportive learning environment that fosters students' overall well-being and growth. (Rogers, 1969). Empathetic, learner-centred teaching has a positive impact on learning outcomes (Cornelius-White, 2007). Empathy-based design is a learner-centred approach that places the needs and experiences of the learner at the heart of the design process (Hashim et al., 2019; Fuller, 2012). Empathy-based design can create social innovations that consider underrepresented groups (Hasim et al., 2019). Empathetic learning design means that the design considers the learner at all stages, is accessible, and invites engagement and interaction (Hasim et al., 2019; Fuller 2012). The details of technological design and the guiding role of the teacher play a significant part in creating a "sense of belonging" for the learner. Sense of belonging refers to an individual's experience of being part of a community or group where they feel valued and accepted. This feeling is known to be linked to learning, as it enhances students' motivation, engagement, and academic success in educational settings. The concept has been particularly studied in higher education, focusing on aspects such as ethnicity and generational status. (Dias-Broens et al. 2024)

In empathetic design, the learner is included as an equal member in the design process (Hashim et al. 2019). This includes mapping the learner's skills, selecting appropriate technologies and interaction methods considering the learner's Zone of Proximal Development (ZPD), and providing scaffolding—timely and paced guidance from teacher-led instruction to more self-directed learning (Hung & Nguyen, 2019).

Empathy-based design is necessary to achieve inclusiveness in the design, which means active participation and understanding the situation and background of other actors (Rogers, 1969). Community in the learning environment requires learners to feel part of a community where their contributions are meaningful and valued (Dias-

Broens et al., 2024). This is achieved by creating learning environments where interaction and collaboration are central, and where learners can share experiences and learn from each other.

Previous research has shown that using the TPACK model, empathetic learning design, inclusiveness, and community, along with co-design, can be used to create technologically and pedagogically enriched learning environments. Based on strong research evidence, these theories and their associated concrete pedagogical principles were selected as the knowledge base for this research and as the foundation for the design process.

Accessible design considers all users, emphasising the need to build accessibility right from the outset when designing (Lomellini et al., 2022; Fennelly-Atkinson et al., 2022). Given that fast learners with strong study skills will learn regardless, the design must be created with the conditions of the weaker in mind (Lomellini et al., 2022; Fennelly-Atkinson et al., 2022). In the context of integration training, the design process considers learners with limited study skills, low literacy levels, and work and study cultures that differ significantly from those in Finland. In addition, it also matters whether the home culture is more oral or written, as Finland has a highly literate culture, assuming familiarity with textual genres that are entirely culture and language dependent.

According to research into online teaching, accessibility has usually referred to the usability of technology (Fennelly-Atkinson et al., 2022). Accessibility is defined by essential dimensions in different contexts. From the perspective of accessibility in my research, it is crucial that learners can study through technology. This requires that the usability of technology in teaching must be designed so that the learner can smoothly master the technology they need daily. To make online learning suitable for all kinds of learners, the design requires cooperation and co-creation in reciprocity with the participants, as well as awareness of the environment and the cultural practices of the participants (Mutahi & Gazda, 2019).

### 3.1.2 Digital Competencies in EU Frameworks

Teachers need a wide range of competencies to succeed in online integration training. These include technological, pedagogical, and cultural skills. Teachers must master the use of ICT in teaching, which requires continuous professional development and in-service training. The PISA 2022 ICT framework (OECD, 2021) introduces a digital teaching and learning assessment metric to the PISA evaluation. This framework helps assess the extent to which and for what purposes teachers use ICT and the role of ICT pedagogically in various teaching situations. Teachers must identify, evaluate, and select the necessary ICT resources that fit the learning objectives, context, and pedagogical approach (OECD, 2021).

Self-efficacy, or the belief in one's ability to perform tasks, is a critical factor in teachers' success in online teaching. By strengthening technological self-efficacy, teachers use educational technology more effectively and confidently (Afari et al., 2023; Gözum et al., 2023), which increases learners' motivation and engagement in online learning (Lee & Ogawa, 2023). The forced shift to online teaching during the COVID-19 pandemic has been seen as an opportunity to innovate teaching and practice the educational use of technologies, especially in maintaining connections with learners (Santagata et al., 2023).

Teacher education programs can enhance teachers' self-efficacy and competencies by providing comprehensive training that focuses on developing both technological and pedagogical skills. The Digital Competence Framework for Educators (Redecker, 2017; Figure 3) includes areas that emphasise using digital technology to enhance and innovate education rather than focusing solely on technical skills.

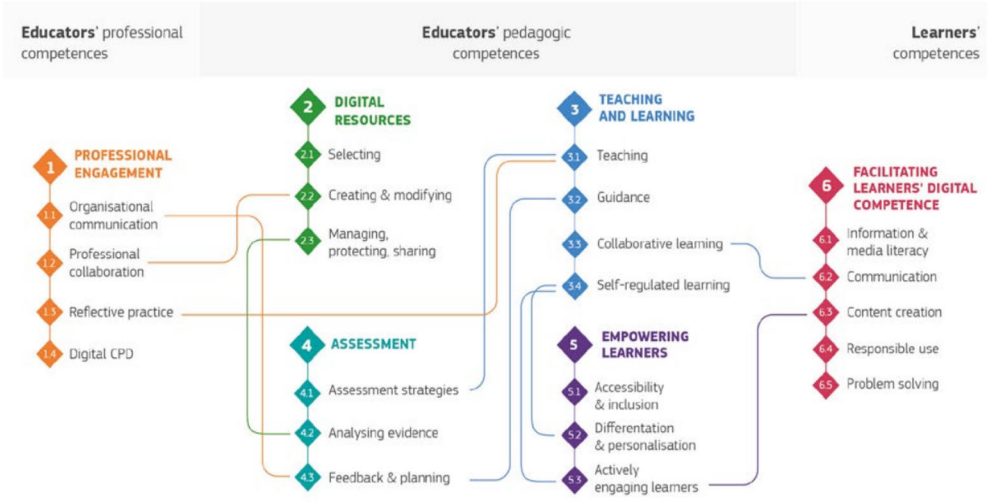



**Figure 3.** The European Framework for the Digital Competence of Educators (DigCompEdu). Source: Redecker (2017). European Framework for the Digital Competence of Educators: DigCompEdu. © European Union, licensed under CC BY 4.0.

Competency in online teaching is crucial for the successful delivery of integration training. Teachers must possess strong digital competencies to effectively use information and communication technology (ICT) in their teaching practices. The European Union's frameworks for digital competencies, such as the Digital Competence framework for citizens (Figure 4), outline essential skills in several areas, including information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving (Vuorikari et al., 2022). These

competencies are critical not only for teachers but also for learners, as they navigate the complexities of online learning environments.


**Figure 4.** The Digital Competence Framework for Citizens (DigComp). Source: European Commission (2017/2018). DigComp 2.1: The Digital Competence Framework for Citizens. © European Union, licensed under CC BY 4.0.

In addition to general digital competencies, teachers must also develop specific skills related to the pedagogical use of technology. This includes understanding how to integrate digital tools into the curriculum to enhance learning outcomes, fostering digital literacy among students, and managing the digital learning environment effectively. Teachers' self-efficacy in using educational technology plays a crucial role in their ability to implement these competencies confidently and effectively (Afari et al., 2023; Gözum et al., 2023). Strengthening technological self-efficacy among teachers not only improves their use of ICT but also increases learners' motivation and engagement in online learning (Lee & Ogawa, 2023).

Furthermore, the forced shift to online teaching during the COVID-19 pandemic has highlighted the importance of digital competencies in maintaining connections

with learners and innovating teaching practices. This period provided an opportunity for teachers to practice and refine their use of educational technologies, especially in supporting continuous learning and engagement despite physical distancing requirements (Santagata et al., 2023).

At the European Union level, frameworks for citizens' digital competence (Vuorikari et al., 2022) and teachers' digital competencies (Redecker, 2017) have been established. These frameworks are used by educational authorities in various countries as the basis for developing curricula. The curricula (FNAE 2022; 2017; 2012) set the criteria for equal and high-quality education. Educational institutions and service providers adapt these abstract, comprehensive curricula to meet the needs of their training programs and learners.

The reasons behind Finland's good PISA performance have been investigated, and teacher education is considered one of the key factors (Doil & Pietzner, 2023; Ustun & Eryilmaz, 2018). Success factors include extensive internships in university training schools, a focus on subject content, the profession's prestige, which attracts the best potential candidates, the value placed on continuing education, and learning skills relevant to PISA studies during teacher training. The emphasis in Finnish teacher education is not on teaching practices or learning ready-made methods but on identifying and developing students' own abilities based on research (Mikkilä-Erdmann et al., 2019). However, the reasons for the recent decline in the Finnish PISA-scores are currently not understood well.

In summary, technological knowledge within the TPACK framework involves not only the technical aspects of using digital tools but also the empathetic and pedagogical application of these tools to create inclusive, engaging, and effective learning environments. As educators and learners alike continue to adapt to the demands of digital learning, these competencies will be essential for ensuring that online integration training is accessible and effective for all participants.

## 3.2 Pedagogical Knowledge (PK)

This section focuses on the pedagogical knowledge that underpins the design of online integration training. In the TPACK framework, pedagogical knowledge refers to an educator’s understanding of teaching and learning processes, including instructional strategies, classroom management, and learner development. In the context of integration training, pedagogical knowledge also includes the ability to support learners with diverse educational, linguistic, and cultural backgrounds in a way that promotes inclusion, engagement, and progress toward employment and active citizenship.

The pedagogical foundation of this research draws from sociocultural and socioconstructivist learning theories, which emphasize the importance of social

interaction, collaboration, and the cultural mediation of learning. These theories are aligned with the Finnish national curriculum for integration training, which promotes community-based and learner-centered pedagogies. Moreover, this section discusses how scaffolding, culturally responsive teaching, and an entrepreneurial mindset are essential pedagogical tools in supporting learners' transitions into working life and society.

Pedagogical knowledge is especially critical in digital environments, where the teacher's role shifts between providing structure and enabling autonomy. The ability to guide, support, and inspire learners while using digital tools requires not only technical proficiency but also strong pedagogical judgment. In this section, pedagogical approaches are examined in the light of both theoretical foundations and practical demands, including the expectations set by the curriculum, the EntreComp framework, and the sociopolitical context of integration training.

In this chapter, particular attention is paid to the concept of an entrepreneurial mindset—not as a form of self-employment or business creation, but as a pedagogical and integrative approach that supports learners' agency, initiative, and capacity to navigate complex societal and working life contexts.

### 3.2.1 Theoretical Foundations of Learning

The pedagogical understanding on which the design is based is built on sociocultural theory (Vygotsky, 1978; Lantolf & Thorne, 2006), which emphasizes the importance of social interaction in learning. The curriculum framework for integration training for adult immigrants is based on a socioconstructivist view of learning (FNAE, 2012), which highlights the importance of community and collaboration in the learning process, as they facilitate the internalisation of knowledge through meaningful social participation (Vygotsky, 1978).

Lev Vygotsky's sociocultural theory emphasises the central role of social interaction in the development of cognition (1978). According to Vygotsky, learning is a social process mediated by language and other cultural tools. He introduced the concept of the "zone of proximal development" (ZPD), which refers to the difference between what a learner can do independently and what they can achieve with the guidance of a more skilled individual. This concept underscores the importance of collaborative learning, where more skilled individuals support the learning process of those who are less skilled.

James Lantolf and his colleague Steven Thorne have applied Vygotsky's ideas to second language acquisition (2008; 2006). They emphasize that cognitive development, including language learning, cannot be fully understood without considering cultural, historical, and institutional contexts (Lantolf & Thorne, 2006). They highlight the role of mediation in learning, where cultural tools such as

language facilitate mental functions (Lantolf & Thorne, 2008). Lantolf's work has also explored the significance of imitation, private speech, and internalization in language learning, demonstrating how social interaction and cultural tools are critical in acquiring a new language. Both Vygotsky's sociocultural theory and Lantolf's later research (2011; 2015) stress the interplay between social interaction and cognitive development, emphasising that learning is deeply rooted in cultural contexts and mediated through language and other symbolic tools.

In integration training, teaching and guidance are language-aware: language and the content to be learned are inherently connected (FNAE, 2022). Language and culturally aware teaching acknowledges that learners come from diverse linguistic and cultural backgrounds. Therefore, learning environments must be culturally sensitive and universal to ensure that the opportunity to learn is open to all. In designing online training, it is important to consider the learner's zone of proximal development to ensure that the material is appropriately targeted and timely for the learner.

### 3.2.2 Teaching Pedagogies

Intercultural online learning involves understanding diverse pedagogical approaches, particularly the challenges that arise when learners from teacher-centred educational backgrounds are introduced to learner-centred and constructivist methods (Yu et al., 2019; Alqarni, 2022). For example, scaffolding, a concept derived from Vygotsky's (1978) work, is crucial in supporting learners who may struggle with self-directed online learning. Scaffolding provides structured, temporary support that gradually shifts responsibility from the teacher to the learner as their skills develop. This approach is particularly effective in integration training, where the goal is to enhance learners' agency in both language acquisition and their ability to navigate Finnish society, especially in the employment context (FNAE 2012; 2017).

Effective teaching in online integration training requires a dynamic blend of teacher-centred and learner-centred pedagogies. The use of scaffolding, as derived from Vygotsky's work, is a key strategy in this blended approach. In the early stages of learning, particularly when learners are new to the language and the online environment, a more teacher-centered approach may be necessary to provide the structure and guidance needed. As learners gain confidence and skills, the teacher's role evolves to facilitate more learner-centered and self-directed activities (van de Pol et al., 2010).

In addition to scaffolding, culturally responsive teaching methods are integral to this pedagogical approach. These methods involve recognising and valuing the diverse cultural backgrounds of learners and incorporating these perspectives into the curriculum and instructional practices. For example, integrating authentic materials that reflect the learners' cultures and experiences can ensure that learning

is more relevant and engaging. Furthermore, real-time interaction in the online classroom allows for immediate feedback and clarification, which is crucial for language development and cultural understanding (Byram 1997/2021; Hung & Nguyen 2022).

### 3.2.3 Entrepreneurial Mindset (EntreComp)

In addition to the previously discussed pedagogical principles, entrepreneurial skills play a vital role in integration training. These skills are not viewed as a direct path to starting a business, but rather as a mindset that strengthens learners' sense of agency, resilience, and ability to participate in society. The goals of integration training include improving employment prospects, encouraging active involvement in societal structures, supporting the recognition of opportunities, promoting initiative, and helping learners to build professional and social networks (FNAE 2012; 2017; 2022). These objectives address not only labour-market readiness but also the broader aims of social integration and empowerment.

Within the context of this research, entrepreneurship is not approached primarily as business creation or self-employment. Instead, emphasis is placed on the entrepreneurial mindset as a pedagogical orientation. This mindset cultivates qualities such as adaptability, initiative, problem-solving, and the ability to collaborate in diverse and changing environments (Bacigalupo et al., 2016). These competencies are essential for successfully navigating both the demands of working life and the wider processes of integration into a new society.

Supporting the development of this mindset requires that teachers adopt an entrepreneurial approach in their own pedagogical practice. This includes helping learners take responsibility for their own learning, encouraging them to identify and pursue meaningful opportunities, fostering creative and practical problem-solving, and building learners' confidence in situations of uncertainty (Gibb, 2005; Davis, 2022). Entrepreneurial thinking thus becomes a fundamental part of the teacher's professional skill set, particularly in online environments where learners are expected to work more independently.

Recent empirical research has confirmed the pedagogical value of this mindset. A systematic review by Bernadó and Bratzke (2024) highlights that mindset-oriented approaches increase learners' proactivity, engagement, and capacity for self-direction in various educational settings. A Finnish study by Joensuu-Salo, Viljamaa, and Varamäki (2022) further shows that sustainable entrepreneurship competence is positively associated with both the intention to pursue employment and with active societal participation. These findings suggest that entrepreneurial competencies support integration not only through economic activity but more broadly by enhancing learners' readiness to contribute to and navigate their new environments.

The EntreComp framework (Figure 5) (Bacigalupo et al., 2016) offers a useful structure for understanding and evaluating both the entrepreneurial competencies expected of learners and those required of teachers. It defines entrepreneurial competence in three main areas:

**Ideas and Opportunities**: Identifying and creating valuable opportunities, being creative, envisioning the future, valuing ideas, and acting ethically and sustainably.

**Resources**: Cultivating self-awareness, staying motivated, mobilising support, understanding basic financial concepts, and inspiring others.

**Into Action**: Taking initiative, planning, managing, coping with risk and uncertainty, collaborating, and learning from experience.

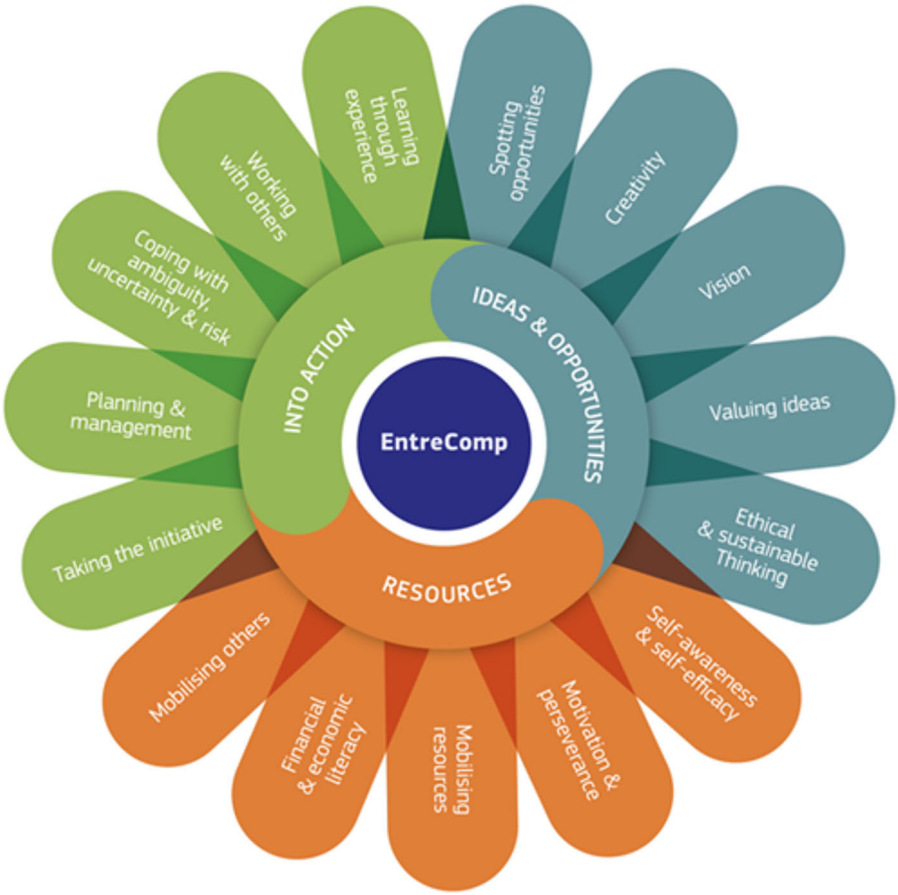



**Figure 5.** The European Entrepreneurship Competence Framework (EntreComp). Source: Bacigalupo et al. (2016). © European Union. Licensed under CC BY 4.0.

In the context of integration training, an entrepreneurial stance is conceptualised in this study as a response to systems in which outcomes are evaluated through institutional or financial performance indicators (Montonen & Lappalainen, 2017; ELY, 2018). In practice, this approach requires trainers to motivate learners to actively engage with working life and broader society. It also involves supporting them through transitional phases and building collaborative networks with employers and other stakeholders. This kind of engagement is often regionally dispersed in online training contexts, where educators must foster connections across geographic boundaries.

## 3.3 Content Knowledge (CK)

This section explores the domain of Content Knowledge (CK) as defined in the TPACK framework, focusing on the specific learning content areas that are essential in integration training. In this context, content knowledge encompasses not only subject-specific knowledge such as second language acquisition and working life skills, but also broader societal, cultural, and digital competencies that support learners' successful integration into Finnish society.

The content of integration training is not neutral or incidental. It is carefully selected and structured to equip adult immigrants with the tools they need for linguistic, economic, and social participation. This chapter highlights the central role of language learning, cultural awareness, entrepreneurial competencies, and digital and civic skills in achieving the holistic goals of integration. Each of these content domains contributes to building learners' capacity to act, adapt, and participate meaningfully in a new and complex environment.

Rather than being taught as separate subjects, these content areas are interwoven and mutually reinforcing. Their selection and pedagogical implementation are guided by national curricula, European competence frameworks, and the pedagogical and technological considerations addressed earlier in this study. This chapter also shows how these content domains informed the design of the digital learning artefact developed in this research, ensuring that the instruction is both pedagogically grounded and contextually relevant.

To deepen the theoretical grounding of content knowledge, this section also draws on Lee Shulman's theory of Pedagogical Content Knowledge (PCK). PCK refers to the specialized knowledge that teachers use to transform disciplinary content into forms that are comprehensible and meaningful to learners. It involves the ability to anticipate learner difficulties, select appropriate instructional strategies, and tailor explanations and materials to diverse learner needs (Shulman, 1986; 1987). Shulman's model forms the basis for more recent frameworks such as TPACK, but retains a critical role in conceptualizing teacher expertise in the intersection between content and pedagogy.

In the context of integration training, teachers must regularly exercise pedagogical content knowledge when delivering instruction to adult learners with varying levels of language proficiency, educational background, and familiarity with the subject matter. Empirical findings from this study show how PCK was reflected in teachers' design decisions, particularly in the integration of authentic and culturally relevant materials into the digital artefacts. For instance, work-life content was contextualized through the use of job-seeking scenarios, workplace communication models, and real-life textual genres, requiring teachers to adapt language and content in ways that made them accessible and relevant for learners. The co-design process further revealed how teachers modified scaffolding, interaction patterns, and language use in response to learner feedback and observed needs. These practices highlight the essential role of pedagogical content knowledge in shaping effective and inclusive learning in the digital integration training environment.

### 3.3.1 Learning Content Areas

Content knowledge in integration training is multi-faceted, encompassing key areas such as second language acquisition, communication skills, and an understanding of Finnish working life, entrepreneurial culture, and institutional structures (FNAE 2012; 2017; 2022). These areas are not taught in isolation but are deeply interwoven, reflecting the holistic goals of integration training to support learners' societal participation, employability, and empowerment.

Language and communication are foundational content domains, as they enable access to other forms of knowledge and interaction in both educational and professional contexts. In addition, familiarity with Finnish work culture—including rights and responsibilities in the labour market, typical workplace practices, and entrepreneurial opportunities—provides learners with the tools to navigate and participate meaningfully in their new environment.

In this research, these content areas are not only part of the curriculum but also central to the design decisions made in developing digital learning artefacts. Understanding how these content domains are selected, structured, and presented in online environments is crucial for evaluating the pedagogical relevance and effectiveness of integration training.

### 3.3.2 Language Learning

Language learning is at the core of integration training, as language proficiency is essential for effective communication, social participation, and access to employment opportunities. In this context, language teaching is not just about

learning the mechanics of a new language but is deeply intertwined with cultural elements. Effective language instruction integrates cultural norms, values, beliefs, and practices into the learning process. This approach ensures that learners not only acquire linguistic skills but also develop an understanding of the cultural context in which the language is used (Gibbons, 2015). For example, using authentic materials that reflect the learners' future social and work environments helps them to better understand and engage with the cultural aspects of language use.

Learning a second language becomes easier when learners use a language to learn content other than the language that is being learned (Gibbons, 2015). Language and culturally aware teaching integrate cultural elements, such as knowledge about the country's institutions, into the instruction. A language and culturally aware teacher recognize her or his own attitudes, can be open, curious, and willing to question cultural norms, accept different perspectives, dare to challenge, and be ready for uncomfortable interactions. Real-time interaction in online learning facilitates language and culturally aware teaching as misunderstandings can be resolved immediately (Hung & Nguyen, 2022; Byram, 1997/2021). In integration training, this means integrating cultural norms, values, beliefs, and practices into the language being learned and using authentic materials

Language learning online has been studied in contexts where learning is voluntary, such as elective language courses at universities (e.g., Lenkaitis, 2019). Learners find teaching in groups, teacher-led learning, and chats and other channels that encourage interaction to be the most effective (Ilin, 2019; Osman & Herring, 2009). By designing effective collaboration opportunities, learner autonomy increases. For example, studying in groups via video conferencing enhances learners' language awareness and individual language learning in various conversational contexts (Lenkaitis, 2019). Teacher support for self-directed learning behavior is emphasized in online language learning (Pan, 2023; Hung & Nguyen, 2022). Students are aware of the potential of ICT for their learning and their technological self-efficacy (Ilin, 2019; Arrosagaray et al., 2019), which should be considered in designing education tailored to the needs and skills of the target group.

Moreover, language-aware teaching recognizes that learners come from diverse linguistic backgrounds and may face unique challenges in acquiring a new language. This requires a flexible and inclusive approach to content delivery, ensuring that the instructional materials and methods are accessible to all learners, regardless of their starting point. Real-time interaction in the classroom further enhances this process by allowing for immediate clarification and reinforcement of language concepts, making learning more effective and meaningful (Byram, 1997/2021; Hung & Nguyen, 2022).

### 3.3.3 Entrepreneurial competencies

Entrepreneurial competencies form a critical content area in integration training. However, in this context, the focus is not on preparing learners to become entrepreneurs in the traditional sense, but rather on fostering an entrepreneurial mindset — a set of transferable skills and attitudes that support agency, adaptability, and active participation in working life and society.

The contemporary labour market increasingly values skills such as creativity, initiative, problem-solving, collaboration, and the ability to cope with uncertainty. These are all competencies that benefit not only aspiring entrepreneurs but anyone navigating dynamic and evolving professional environments. In integration training, these skills are essential for empowering learners to take initiative, recognize and act upon opportunities, and build networks that support their long-term integration and employability.

The EntreComp framework (Bacigalupo et al., 2016) provides a structured model for identifying and developing these competencies. It outlines key areas such as generating ideas and opportunities, mobilizing personal and external resources, and translating intentions into action. These areas are aligned with the goals of integration training, which seeks to strengthen learners' capacity for autonomy, resilience, and engagement.

Incorporating entrepreneurial thinking into the curriculum (FNAE 2012; 2017; 2022) encourages learners to adopt a proactive and future-oriented approach to their integration journey. This includes learning to navigate institutional systems, make informed choices, take calculated risks, and contribute meaningfully to the economy and community. By emphasising entrepreneurial competencies as part of content knowledge, integration training helps prepare learners not just for employment, but for broader societal participation and lifelong learning.

### 3.3.4 Cultural Awareness

Cultural awareness is integral to both language learning and work and entrepreneurship culture, as it enables learners to navigate social and professional environments more effectively. In integration training, cultural content is woven into the curriculum to help learners understand the societal norms and values of their new environment (FNAE 2012; 2017; 2022). This includes familiarising them with the legal, educational, and economic systems of the host country, as well as the social etiquette and practices that are common in both personal and professional interactions.

Understanding cultural differences and similarities enhances learners' ability to communicate and collaborate with others from diverse backgrounds. It also prepares them for the cultural challenges they may encounter in the workplace or community

settings. By integrating cultural awareness into the curriculum, educators help learners build the intercultural competence needed for successful integration (Byram, 1997/2021; Lantolf & Thorne, 2006).

Online learning is well-suited for intercultural communication because video, audio, and chat connections can bring together people from different backgrounds in equal interaction (Byram, 1997/2021). The teacher acts as a facilitator of interaction online and must recognize the intercultural context, creating an inclusive learning environment where cultural issues are handled sensitively and appropriately, encouraging learners to do the same. Learners are encouraged to reflect on their own cultural assumptions, experiences, and learning processes (previously cited).

Pedagogical methods that promote cultural reciprocity, global thinking, and intercultural competence are also essential in fostering inclusive online learning environments. These methods, coupled with real-time interaction, help resolve misunderstandings quickly and reduce stress and social isolation among learners (Mutahi & Gazda, 2019; Hung & Nguyen, 2022). Additionally, inclusive teaching practices must integrate cultural elements, such as norms, values, and beliefs, into the language learning process, using authentic materials to create a culturally aware and responsive educational experience (Byram 1997/2021).

### 3.3.5 Other Content Areas

Beyond language, work-life and entrepreneurial skills, and cultural awareness, integration training may also include other relevant content areas, such as digital literacy, civic skills, and vocational skills (FNAE 2012; 2017; 2022). These areas are tailored to the specific needs of the learners and the demands of the local labour market. For instance, digital literacy is increasingly important in today's technology-driven world, and teaching these skills ensures that learners can effectively engage with digital tools and platforms, both in their studies and in the workplace (Vuorikari et al., 2022).

On the other hand, civic skills help learners understand their rights and responsibilities as members of their new society, fostering a sense of belonging and participation. Vocational skills training, which may be offered in conjunction with language learning, provides learners with practical skills that directly enhance their employability and economic prospects.

Content knowledge in integration training is comprehensive and interconnected, covering language learning, employability, entrepreneurship, cultural knowledge, and other essential areas. By integrating these content areas, educators can provide learners with the knowledge and skills they need to succeed in their new environments. This holistic approach ensures that integration training not only meets

the immediate linguistic needs of learners but also prepares them for long-term success in the labour market and society.

This chapter has presented the theoretical foundations and operational principles that form the knowledge base of this research. Grounded in established research, these frameworks were carefully selected to inform the design and implementation of the integration training. The emphasis on pedagogical models, such as language-aware instruction, inclusive learning design and entrepreneurial thinking, ensures that the educational strategies are aligned with the overarching goal of supporting learners' linguistic, social and professional development. Together, these elements constitute the core of the design approach applied in this study.

# 4 Data and Methodological Approaches

This chapter outlines the methodological foundations of the study by describing the research design, data collection strategies, analytical approaches, and ethical considerations. The aim is to provide a transparent account of how empirical material was generated and analysed, and how these methodological choices support the research objectives.

The first section describes the different types of data collected over several phases and explains the use of multiple qualitative approaches, including action research, case study methodology, thematic analysis, and content analysis. Each method is discussed in relation to its relevance within the broader research process and its suitability for addressing the specific questions posed in the sub-studies.

In addition to these analytical approaches, the chapter introduces Design Science Research (DSR) as the overarching methodological framework. DSR was selected to guide the development and evaluation of design artefacts in an iterative and context-sensitive manner. It provides a flexible structure for integrating research, practice, and design in a real-world educational setting.

The six-phase model used to organise the artefact development and data utilisation process is presented in detail, illustrating how the interplay between empirical work and design evolved over time. The chapter concludes with a discussion of the ethical principles that informed the study, including procedures related to informed consent, participant involvement, and data protection.

## 4.1 Data Collection and Analytical Methods

This research draws on a diverse and extensive dataset collected throughout the multi-year design process of online integration training. The data consists of interviews, surveys, observations, digital learning environments, and development documentation, providing a comprehensive understanding of both the current state and developmental potential of online integration training.

The data was collected over several years, across five articles, and reflects iterative cycles of analysis and design. Both public and confidential sources were

used, such as national curricula (FNAE 2012; 2017), national indicator reports, internal planning documents, continuous feedback from course participants, implementation plans, teacher training data, and course websites. An overview of data sources and their distribution across the five articles is presented in Table 2.

**Table 2.** Overview of data sources and the time period covered in the article.

| Overview of data sources and the time period covered in the article | | |
|---|---|---|
| **Paper** | **Time period** | **Data used** |
| **I** | 2015-2019 | Course Websites (22, 2015-2021)<br>Curriculum Guidelines 2012<br>Curriculum Additions 2017<br>Ongoing Feedback from Courses, Notes<br>Development Materials (3 development days)<br>Implementation Plans (3)<br>Individual Study Plans (329 students)<br>Internal Guidelines<br>OPAL Feedback (329 students)<br>Presentations in ELY Centre, 10 (2015-2019)<br>Report 2019 National Indicators (329 learners)<br>Observation Material from Workshop: 5 sheets and workshop plans |
| **II** | 2020 | Interviews: 11 semi-literate learners, 2 native language instructors, 1 teacher |
| **III** | 2019 | Surveys: 21 initial and final surveys for teacher trainees |
| **IV** | 2021 | Interviews: 8 teachers |
| **V** | 2015-2021 | Course Websites (22, 2015-2021)<br>Curriculum Guidelines 2012<br>Curriculum Additions 2017<br>Ongoing Feedback from Courses, Notes<br>Development Materials (3 development days)<br>Implementation Plans (3)<br>Individual Study Plans (329 students)<br>Internal Guidelines<br>OPAL Feedback (329 students)<br>Presentations in ELY, 10 (2015-2019)<br>Report 2019 National Indicators (329 learners)<br>Report 2021 National Indicators (630 learners)<br>Observation Material from Workshop: 5 sheets and workshop plans |

### 4.1.1 Methodological Positioning: Action Research and Case Study Orientation

The research can be characterized as situated at the intersection of Design Science Research (DSR) and action research, with elements of case study methodology. The

artefact development followed an iterative process embedded in the real-world context of online training for immigrants, combining the practical problem-solving orientation of DSR (Peffers et al., 2007) where the researcher was simultaneously involved in developing, observing, and analysing the training environments. This aligns with the principles of action research (Baskerville, 1999), which emphasises solving practical problems while generating knowledge through iterative cycles of planning, action, and reflection.

At the same time, the research includes features of a qualitative case study, particularly in its in-depth exploration of a specific phenomenon – the online integration training system – within its real-life context. This positioning justifies the use of multiple data sources and methods to build a holistic understanding.

### Analytical Approaches and Rationale

Given the variety of data and its developmental nature, multiple analytical approaches were employed across the different phases of the research. These methods were selected based on their suitability to address specific research questions and data types, and they reflect both data-driven and theory-informed orientations, depending on the phase and purpose.

### Thematic Analysis

Thematic analysis (Aronson, 1995; Nowell et al., 2017) was used particularly in Article III, which examined feedback from teacher trainees. The method allowed for identifying recurring patterns, concepts, and themes that informed the development of new artefact features and pedagogical practices. The thematic approach was particularly useful in processing qualitative survey data and interviews, enabling the emergence of participant-driven insights.

### Content Analysis

In Article IV, qualitative content analysis (Galletta & Cross, 2013; Schreier, 2012) was applied to teacher interview transcripts. This method facilitated the identification of key elements related to teachers' practices, challenges, and development needs in online integration contexts. The analysis was partly guided by theoretical constructs, such as the TPACK framework, reflecting a theory-driven orientation.

### Continuous Feedback Analysis

In Articles I, II, and V, feedback collected throughout the training cycles was analysed using iterative, collaborative techniques, such as group discussions and visual methods (e.g., sticky note clustering). This participatory analysis supported the DSR process by enabling rapid identification of practical development needs and co-created solutions. These methods are aligned with action research principles, where collective reflection feeds into real-time improvements.

### Analysis of Digital Traces

Digital course materials, discussion forums, and assessment data were systematically reviewed to reconstruct the development history of the artefacts and analyse learners' interaction patterns. This documentation analysis helped assess how artefacts were used in practice, contributing to understanding their functionality and usability (Articles I, II, V). This type of analysis was largely data-driven and grounded in the specific digital context of the training.

### Inductive and Theory-Guided Reasoning

The analytical process alternated between inductive (data-driven) and deductive (theory-guided) approaches, depending on the research question and phase. In the early design phases, inductive reasoning dominated, especially when exploring learners' and teachers' needs. Later phases incorporated theoretical lenses, such as the TPACK framework, communities of practice, and design science theory, to guide the interpretation of findings and situate the artefact within broader pedagogical discourses.

This methodological pluralism reflects the logic of Design Science Research, where rigorous inquiry is embedded in iterative development, and both practical relevance and theoretical grounding are pursued in parallel.

## 4.1.2 Data Limitations

The study identified some challenges and improvement suggestions. To improve data accuracy in future studies, more precise documentation and standardised data collection methods could be utilized. National indicator reports on online implementation were not ultimately used for quantitative data analysis as originally planned, due to significant shortcomings, such as internal system changes by the service provider. Simultaneously, discussions began both within the research context and at the level of state administration concerning the appropriateness of the national indicators and whether they measured the aspects of integration training that truly

matter (e.g., Ruuskanen & Väänänen, 2022; Kurki et al., 2017). Existing indicators consistently portrayed the training as unsuccessful, raising concerns about whether these metrics adequately reflected the complexity and goals of integration training.

The design of survey and interview questions could be refined to gather more detailed information, particularly on data security and participants' individual experiences and engagement methods. The close familiarity of the participants and interviewees provided insight and depth of expertise in the interviews but also risked biased interpretations. In future studies, the use of external interviewers could balance these perspectives.

## 4.2 Design Science Research (DSR) as the Methodological Framework

Design Science Research acts within a pragmatic research paradigm, and studies the development of solutions for practical real-life problems (Hevner et al., 2004). Using DSR allows for the creation of relevant research on useful artefacts in the information society (Baskerville et al., 2018). Initially employed in the research of information systems, DSR has evolved into a research paradigm examining technology at the intersections of various social, societal, and behavioural dimensions (Peffers, 2007; Baskerville, 2018). The popularity of DSR has expanded across multiple fields, leading to the development and refinement of theories and recommendations (e.g., Peffers et al., 2007; 2006).

The aim of DSR, through the use of DSR methods, is to examine how an artefact should be designed to be necessary, useful, and meet the requirements set by its usage environment. Designing online education involves a process where problems are defined, and the solution involves developing and shaping the educational service, continuously evaluating and testing it (Peffers et al., 2007). While plain design creates artefacts, DSR also answers questions about the artefacts and their environment by employing a combination of research methods in a project's different stages (Johannesson & Perjons, 2014, p. 77).

DSR operates within a pragmatic paradigm, addressing real-life problems by creating artefacts—such as models, methods, or systems—that offer practical solutions. The process follows a six-phase model (Peffers et al., 2007):

**Problem Identification and Motivation**: Recognising a critical issue and its relevance, laying the foundation for subsequent design work.

**Objectives of a Solution**: Establishing clear goals based on stakeholder needs and environmental factors.

**Design and Development**: Collaboratively creating and refining the artefact, ensuring it is user-centered and effective.

**Demonstration:** Implementing the artefact in a real-world setting to test its functionality and gather feedback.

**Evaluation**: Analysing feedback to assess the artefact's effectiveness and identify areas for improvement.

**Communication**: Sharing findings and the final design with the broader community for knowledge dissemination and potential adoption.

This iterative process ensures continuous improvement and adaptation of the artefact to meet evolving user requirements.

In my research, DSR is emphasised, particularly in the technological design of integration training artefacts. However, Action Research (AR) is also employed, especially when active participation and collaboration with stakeholders are required, such as in the research involving semi-literate immigrants. AR complements DSR by focusing on practical problem-solving within specific contexts (Baskerville, 1999; Iivari & Venable, 2009). This integration of DSR and AR methodologies allows for both the development of innovative solutions and the advancement of theoretical understanding (Peffers et al., 2007).

Peffers et al. (2007) have highlighted the potential for DSRM to be used in structuring AR, suggesting that the methodologies can be conceptually and methodologically integrated to enhance the research process. This combination offers flexibility and a comprehensive approach to addressing both practical and theoretical challenges in educational design.

The Design Science Research methodology (DSRM) provides a structured framework for tackling design challenges, from problem identification to solution development and evaluation (Peffers et al., 2007). This approach integrates scientific knowledge with practical application, facilitating innovative solutions for the technological design of integration training. DSR emphasises both artefact creation and the theoretical conceptualisation of design, contributing to the prescriptive knowledge base that aims to enhance human capabilities (Baskerville et al., 2018). Peffers et al. (2007) also present a widely recognized DSR framework that legitimises the goals, processes, and outcomes of research within information society studies. In integration training, this evolving framework is essential for addressing the unique needs of adult immigrants, fostering not only language skills but also interactivity, cultural integration, and access to employment and education.

## 4.3 Design Artefacts and the Six-Phase Development Process

The Design Science Research (DSR) process in my research is structured around the creation and evaluation of artefacts through a systematic and iterative methodology. DSR provides a framework that encompasses stages from problem identification to solution development and evaluation, focusing on how artefacts should be designed to meet specific needs and improve technological and social environments (Peffers et al., 2007; Baskerville et al., 2018). In my research, I utilise three types of artefacts that support the development and evaluation of integration training. In this section, I examine the artefact design process through the lens of six iterative steps (Peffers et al., 2007) and introduce the data used in the research papers.

### Educational IT Artefact and Meta-Artefacts in DSR

In my research, an educational IT artefact (see Figure 6) was developed to support the online implementation of integration training, focusing on enhancing language learning and work-life skills. This artefact was created using a co-design and user-centered approach, ensuring it addressed the specific needs of both learners and teachers. The development process involved active researcher participation, often incorporating Action Research (AR) to complement the Design Science Research (DSR) methodology. This collaboration was essential for ensuring that the solutions were both relevant and practical (Baskerville et al., 2018).

The DSR approach emphasises the creation of artefacts that are both innovative and functional, aimed at solving real-world problems in technological environments (Hevner et al., 2004). The research process begins with identifying a problem, followed by designing and developing an artefact to address that issue. The project progresses through a series of iterative cycles, where the artefact is continuously tested, evaluated, and refined based on feedback (Gregor & Hevner, 2013).

In this research, three types of artefacts were created: the educational IT artefact, a meta-artefact, and a social sub-artefact. The meta-artefact, which emerged during a sub-study with teacher trainees, is a conceptual framework guiding the design and implementation of the IT artefact. It supports the practical construction of tangible artefacts and helps systematise knowledge that can be applied across different contexts (Iivari, 2015). This meta-artefact also paved the way for the development of a micro-credential in teacher training, emphasising the integration of technology in online learning, which constitutes the second meta-artefact of this research (Hunt et al., 2020).

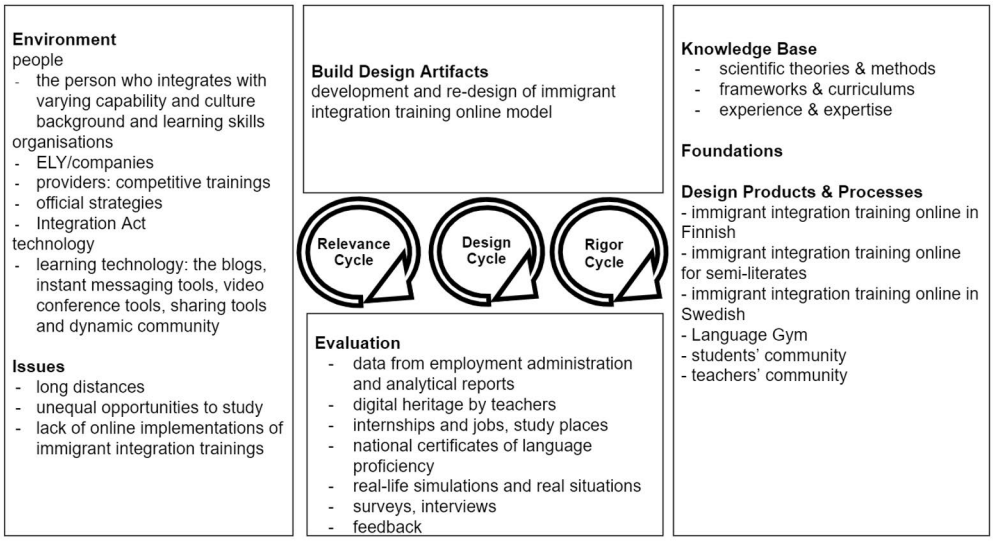



**Figure 6.** Exploring the design of immigrant integration training online. The process is divided into three cycles: the Relevance Cycle, the Design Cycle, and the Rigour Cycle (according to Hevner, 2007).

## Social Sub-Artefacts

The concept of a social sub-artefact extends the idea of an artefact to include its social implications (Leoz & Petter, 2018). A social sub-artefact refers to the social structures that operate within and around the technological artefact, influencing and being influenced by it. These structures can be existing networks or new communities formed through the use of the artefact. The adaptability of both the technological artefact and the social structure is crucial for the successful integration of the two (Leoz & Petter, 2018).

In the context of online integration training, the social sub-artefact includes the community of educators and learners who interact within the digital learning environment. This community represents a traditional social structure that has adapted to the online context, with teachers collaborating in designing and delivering instruction. The research examines how this social structure evolves and sustains itself, providing insights into changes in the teaching profession and the resilience required from educators in an online environment.

This research utilized Leoz & Petter's (2018) framework to explore the social aspects of the problem and define objectives for the social sub-artefact, based on extensive interview data with teachers. This data was critical in understanding how the social structure within the artefact operates and how it can be further developed to support effective online education.

### Demonstration and Evaluation

The artefacts were tested and refined through workshops and pilot programs, involving student teachers and semi-literate learners. Continuous feedback was collected and analysed to improve the design and functionality of the artefact. This iterative process ensured that the final design was not only effective in achieving its educational goals but also adaptable to the needs of its users.

This research gained valuable insights into the types of technology and social structures that best support online education for culturally diverse student groups. The findings contribute to the broader field of educational technology design, offering practical solutions and theoretical advancements that can be applied in similar contexts.

In the following section, I examine the artefact design process through the lens of six iterative steps (Peffers et al., 2007) and introduce the data used in the research papers.

### Six iterative steps

*1. Problem Identification and Motivation*

The initiation phase of this study focused on the initial design of the integration training artefact, guided by Hevner's design cycles (RQ1a). During this phase, the first version of the artefact was developed, laying the foundation for subsequent iterations. The research employed the Design Science Research Methodology (DSRM) approach to conceptualise the entire training artefact. This process involved brainstorming sessions and a thorough review of relevant reports, research articles, theoretical frameworks, and existing laws and practices related to integration training.

The data used in the initiation phase included curriculum guidelines, national indicator reports, and various digital traces from previous courses. These sources provided a comprehensive understanding of the current state of online integration training and helped identify key areas for improvement. This data was crucial in shaping the first version of the artefact, designed to comply with the Finnish Act on the Integration of Immigrants and relevant educational standards.

*2. Objectives of a Solution*

The defining objectives phase aimed to determine how the artefact should be further developed to meet the needs of its users, particularly semi-literate immigrants (RQ2). The research utilised both Action Research (AR) and Design Science Research (DSR) methodologies to explore these needs. Data collection included background

information on learners, observations, and interviews with both learners and teachers.

Additionally, this phase focused on understanding the social structure of online integration training and identifying what is required to enhance teacher collaboration and support semi-literate learners (RQ2 & RQ4ab). Teacher interviews were particularly important in this phase, providing insights into the challenges and opportunities of online training from the educators' perspective. The data collected from these interviews and observations was thematically analysed to inform the development of the artefact, addressing research questions related to accessibility, collaboration, and the role of entrepreneurial features in online teaching.

*3. Design & Development*

The design and development phase centered on the iterative creation and refinement of the integration training artefact. This phase utilised DSR methodology, incorporating continuous feedback from previous phases and new insights gained during workshops and testing. The research involved co-design with educators and learners (RQ2, RQ3, RQ4ab, RQ5) to ensure the artefact was user-centered and met real-world needs.

Data collected during this phase included observation materials from workshops (RQ3, RQ5), individual study plans, and course websites. These sources provided detailed insights into how the artefact functioned in practice and where improvements were needed. The data was analyed ussing content and thematic analysis, which helped fine-tune the design and enhance the artefact's effectiveness for the target audience.

*4. Demonstration*

The demonstration phase involved implementing the artefact in a real-world setting to evaluate its functionality and gather feedback. This phase included workshops with student teachers (RQ3) to understand their experiences in the design process. Additionally, a case study focused on the artefact's use among semi-literate immigrants (RQ2) and assessed how well the artefact supported these learners. Lastly, this phase included three iterations (Paper V) of the standard integration training online implementation (RQ5), exploring the continuous, long-term, cyclical, and iterative co-development of the training design.

Data collected during this phase included feedback from learners, student teachers, interviews with semi-literate learners, and observations from workshops. The demonstration allowed the research team to monitor how the artefact performed in the Finnish educational environment, identifying strengths and areas for improvement.

*5. Evaluation*

The design evaluation phase focused on assessing the artefact's effectiveness and impact based on feedback and data collected during the demonstration phase. The research used a combination of continuous feedback collection, content analysis, and thematic analysis to evaluate the artefact's success in achieving its goals. This phase also involved comparing the original and latest versions of the artefact to understand its development over time (RQ5).

Data used in this phase included final surveys from student teachers, development materials from co-design sessions, digital traces from online courses, and discussions with financier. These sources were critical in evaluating the artefact's usability, accessibility, and overall effectiveness, providing insights for future iterations.

*6. Communication*

In the final phase, the research findings were communicated to the broader community. This included sharing the final version of the artefact and the results and implications of the study through academic publications, presentations, and reports. The communication phase ensured that the knowledge gained from the research was effectively disseminated, influencing the broader field of educational design and integration training.

The data acting during this phase included all previously collected information, which was summarised and presented in a way thaso that it highlighted the key findings and their significance for both theory and practice. This phase also involved feedback from stakeholders on the research outcomes, which was incorporated into the final documentation and presentations.

**Table 2.** Research design following the six-phase DSR method.

| DSR Stage | Description | Methods | Paper/RQ | Artefacts | Data Sources |
|---|---|---|---|---|---|
| Initiation | Defining the initial concept and context for the online integration training artefact, including its purpose and scope. | DSRM, Brainstorming | RQ1a: How to design fully online integration training based on the Finnish Act on the Integration of Immigrants?<br>RQ1b: How well does the fully online integration training succeed in terms of participants' language level?<br>RQ1c: How well does the fully online integration training succeed in terms of participants' employment?<br>RQ1dHow well does the fully online integration training succeed in terms of participants' career pathways? | 1st version of the integration training artefact | Curriculum guidelines, national indicator reports, digital traces from previous courses |
| Defining objectives | Setting clear objectives for the development and improvement of the artefact, especially for semi-literate learners and teacher collaboration. | Action Research (AR) + DSR, Interviews, Observations | RQ2: How can an accessible and successful digital education service be produced for semi-literate immigrants in Finland to promote integration and inclusion?<br>RQ4a: What is required for teachers' collaboration in online training promoting the integration of adult immigrants?<br>RQ4b: How entrepreneurial features contribute to the social structure of online teachers? | Objectives for adapting the artefact to semi-literate learners and enhancing teacher collaboration | Background information on learners, teacher interviews, thematic analysis of observations |
| Design & Development | Developing and refining the artefact based on the set objectives and feedback, focusing on creating a user-centered and culturally responsive design. | Co-design, Field Studies, Workshops | RQ2<br>RQ3: What experiences did student teachers have about participating in the design process? | Educational IT artefact, Meta-artefact (Micro-credential for teacher training) | Observation materials from workshops, individual study plans, course websites |

| DSR Stage | Description | Methods | Paper/RQ | Artefacts | Data Sources |
|---|---|---|---|---|---|
| Demonstration | Testing the artefact in real-world settings, including workshops with student teachers and a pilot with semi-literate learners. | Design Case, Pilot Programs, Continuous Feedback Collection | RQ2<br>RQ5: How can entire online immigrant integration training be created that supports inclusion and integration? | Refined educational IT artefact, Updated meta-artefact | Learner and student teacher feedback, semi-literate learner interviews, workshop observations |
| Evaluation | Analysing the effectiveness and impact of the artefact, considering user feedback, and identifying areas for further development. | Thematic Analysis, Content Analysis, Continuous Feedback | Linked to all RQs, especially RQ2, RQ4ab, and RQ5 | Evaluated and improved versions of the educational IT artefact and social sub-artefact | Final surveys from student teachers, development materials from co-design sessions, digital traces, financier discussions |
| Communication | Disseminating the research findings, sharing the developed artefacts, and contributing to the broader knowledge base in the field of educational technology design. | Academic Publications, Presentations, Knowledge Dissemination | All RQs | Final versions of the artefacts, including the educational IT artefact, meta-artefact, and social sub-artefact | Summary and presentation of all previously collected data, stakeholder feedback on research outcomes |

## 4.4 Ethical Considerations

Throughout the research process, strict adherence to the basic ethical principles concerning research of the Finnish National Board (TENK, 2019) was maintained. Participation in the studies was entirely voluntary, and all participants were informed of their involvement in the research and gave their consent for their data to be used for research purposes. Before data collection, participants were informed about the key objectives of the research, and the information provided was identical for all participants. The data was handled anonymously, and participants were aware of this during data collection.

The research used extensive data, including both public and confidential sources. Public sources included curricula and national indicator reports for 630 training participants. Confidential sources included course feedback, implementation plans, digital footprints in the learning environment, development materials, learning outcome assessments, and interviews. Presentations and some interviews were also available for research purposes to other researchers.

Strict ethical practices were followed in handling the data. Interviews and surveys were transcribed after data collection, and participants' names were replaced with codes. Given the small number of participants in workshops and interviews, the risk of identifying participants was higher. Interviewees are completely anonymised in the publications. This was accounted for in the reporting, and care was taken to avoid any reporting that could harm the participants.

All data was stored in a secure university network folder, and only the authors had access to the data. The studies did not involve any physical interference, deviations from informed consent, research on children under 15 without parental consent, exceptionally strong stimuli, long-term mental harm with greater risk than daily life, or endangering participants' safety (see Finnish National Board on Research Integrity, 2019). Therefore, the studies did not require ethical pre-evaluation in Finland.

In Sub-study II, some participants were under international protection, so their anonymity was more strictly protected, and only Ahola knew the identities of the learners. Research permits were collected with interpreters to ensure participants understood the nature of the research. In Sub-study III, research permits were collected with the initial survey, and participants were asked to complete the surveys with nicknames to protect anonymity. In Sub-study IV, the identities were known to the authors, but it was possible to handle the data so that individuals could not be identified from the research articles. All research permits are stored in a secure university network folder.

The research also considered participants' comfort and safety. Discussions with learners were always held in familiar environments, either in person or with a familiar small group. In Sub-study II, a familiar native language instructor was

present, which improved the quality of the discussion and provided a deeper understanding of the subjects being studied. This approach also enhanced the ethical nature of the research and the well-being of the participants.

In my dissertation research, I have used artificial intelligence ethically by following the University of Turku's guidelines on AI in research. I have ensured transparency by documenting the use of AI in the research process and have avoided inputting confidential, personal, or unpublished research data into AI tools. AI has been used solely in the summary section of the dissertation for language correction, as well as for organizing and summarizing ideas. However, all analytical interpretations and conclusions remain entirely my own responsibility.

# 5 Results

This chapter presents the dissertation's results through the lens of five peer-reviewed articles. The structure is linked to the research questions (see Chapter 1.3, Table 1) and follows the thematic order of the articles, offering a unified interpretive framework. The first section brings together Articles I and V, both of which investigate artifact design and its pedagogical implications. These articles focus on the same design process: Article I describes how co-design reveals key design decisions in the educational context, while Article V deepens this by showing how the artifacts' design shapes teachers' understanding and practices.

The remaining sections of the chapter each correspond to one article and reflect distinct yet interconnected aspects of the research:

Section 5.2 discusses Article II, which focuses on the accessibility and inclusion of semi-literate learners in online integration training.

Section 5.3 presents Article III, which investigates the development of teachers' digital pedagogical competence through continuing education.

Section 5.4 is based on Article IV and explores how collaboration among teachers contributes to change within the professional learning community.

## 5.1 Artefact Design and Pedagogical Perspectives

This research began by defining the requirements for a fully online integration training programme referred to as the artefact documented in Paper I. The aim was to create an accessible, inclusive, and pedagogically grounded implementation of integration training that could reach participants across a wide geographical area. As there were no existing models of similar scale in Finland at the time, both teaching and studying in a fully online format represented new experiences for those involved. The design of the artefact ultimately shaped the everyday practices of a diverse group of teachers and learners.

The research questions addressed in this section are:

**RQ1a.** *How to design fully online integration training based on the Finnish Act on the Integration of Immigrants?*

**RQ5.** *How to create entirely online immigrant integration training that supports inclusion and integration?*

To answer this question, the research process followed the three cycles of design science research (DSR): the relevance cycle, the design cycle, and the rigour cycle (see Chapter 4.3). Paper I focused on identifying the design requirements in close collaboration with practitioners and learners, while Paper V examined how the evolving artefact influenced pedagogical thinking and teacher agency throughout the development process.

The relevance cycle included data from collaborative workshops with teachers, which helped identify core challenges and opportunities for digital implementation. Teachers described uncertainty and even resistance at the beginning of the process, highlighting the lack of existing models and the need for shared pedagogical understanding. Paper V shows that participating in the co-design process led to a gradual shift in thinking: teachers began to perceive the artefact not only as a technical structure but as a pedagogical space that required conscious decisions about learning, interaction, and support.

The design cycle focused on iterative prototyping, where different solutions were tested and adjusted through feedback from teachers and learners. This process contributed to the formulation of key design principles, which form the foundation of the artefact:

Key Design Principles (derived from Paper I):

1. Accessibility: The learning environment needed to be easily navigable and usable for both learners and teachers. Accessibility was considered on three levels:
   - *Linguistic accessibility:* use of clear and simplified Finnish, visual supports, and multilingual glossaries
   - *Pedagogical accessibility:* scaffolded tasks and materials that accommodated varying levels of literacy and digital skills
   - *Technological accessibility:* mobile-friendly design, low bandwidth requirements, and intuitive user interfaces
2. The Teacher's Role: The role of the teacher shifted from content provider to facilitator and guide. Learning was supported through structured scaffolding, regular interaction, and formative feedback—rather than relying on independent study alone.
3. Interaction: The artefact enabled both formal and informal interaction essential for language learning and social inclusion. Synchronous sessions,

peer collaboration, and discussion forums promoted meaningful engagement and networking.

Paper V further demonstrated how the co-design process itself became a form of professional development. Teachers reported increased confidence in digital pedagogy, greater ownership of the training model, and a stronger alignment between their pedagogical values and practices. The artefact functioned as more than a delivery mechanism: it became a reflective tool that challenged teachers to re-examine assumptions about integration, inclusion, and learning in digital environments.

Findings related to RQ1a (Papers I & V):

- Designing a fully online integration training programme required a pedagogical reorientation, not merely technical adaptation.
- Co-design processes empowered teachers to collaboratively shape inclusive practices and develop a shared pedagogical vision.
- The artefact's accessibility, structure, and interaction features supported meaningful participation and learning for learners with diverse backgrounds and needs.
- Teachers' roles evolved throughout the process, resulting in increased professional agency, collaboration, and reflective practice.

Although the primary focus here is on RQ1a, the design and early implementation phase also generated preliminary insights relevant to the following research questions:

**RQ1b.** *How well does the fully online integration training succeed in terms of participants' language proficiency?*

**RQ1c.** *How well does the fully online integration training succeed in terms of participants' employment outcomes?*

**RQ1d.** *How well does the fully online integration training succeed in terms of participants' longer-term career pathways?*

Initial observations suggest that the learning outcomes of the online training were equivalent to, or in some cases slightly higher than those of traditional classroom instruction. Learners benefited from their existing skills and experiences, which were taken into account already in the early design phase. The flexibility of the online model made it possible to reach participants in remote areas and to tailor content and support to different learner profiles.

By the end of the programme, the majority of students had reached their target language proficiency and reported progress toward employment and study goals.

These findings suggest that, when designed with a strong pedagogical foundation, online integration training can be at least as effective as in-person delivery particularly when accessibility, interaction, and guidance are thoughtfully embedded in the design.

## 5.2 Accessible and Inclusive Online Training for Semi-Literate Learners

The research focused on developing an accessible and successful digital education service for semi-literate immigrants in Finland to promote integration and inclusion. The goal was to create an empathetic and interactive digital learning environment designed for learners with weak literacy skills.

The key research question was:

**RQ2.** *How to produce an accessible and successful digital education service for semi-literate immigrants in Finland to promote integration and inclusion?*

The research used a case study method to investigate online education for learners with low literacy skills. The research emphasized empathetic digital design aimed at creating an engaging and enjoyable experience for semi-literate learners. The approach included key elements that made the learning process empowering, comfortable, and safe for users with limited literacy.

From the perspective of the key aspects of DSR, the research considered the relevance cycle in designing and implementing the digital education service for a specific group of semi-literate immigrants requiring anonymity. The design cycle involved an iterative process to develop and refine the empathetic digital learning environment. The rigour cycle produced additions to the research data by evaluating the effectiveness of the digital education service in improving literacy skills and promoting integration.

The results showed that empathetically and carefully designed interactive digital environments could be both engaging and effective for semi-literate learners. Despite their limited literacy skills, these learners were able to use mobile devices smoothly in online learning. Teaching literacy, especially strengthening knowledge of the Latin alphabet (FNAE, 2012; 2017), was straightforward when the learning design was accessible, and learners could navigate digital learning environments effectively.

In practice, all necessary materials were prepared on tablets for the learners, and all extraneous content was removed from the devices (see Paper II). Learners reported that online learning was easy and that they had achieved their individual

goals in literacy advancement by the end of the training. The success of the experiment highlighted the pedagogical strength of teacher-led support, where responsibility was gradually transferred more to the learners (Hung & Nguyen, 2019). The teacher needed to be consciously empathetic, present, trustworthy, and sensitive to the required redesign of the training. Previous experiences in co-designing online training significantly contributed to positive outcomes. Additionally, the research emphasized the importance of a sociocultural, learner-centered approach in designing effective online education experiences for individuals with low literacy skills.

## 5.3 Continuing Education in Online Pedagogy for Teachers

The research presented in Paper III investigates the experiences of teacher trainees as they participate in the online teaching design process.

The primary research question was:

**RQ3.** *What experiences did student teachers have of participating in the design process?*

Paper III reveal that teacher trainees' beliefs about teaching and learning play a major role in their pedagogical choices. However, their initial perspectives evolved significantly through hands-on experience in online teaching, particularly as trainees engaged in experimental training that encouraged practical applications of online pedagogy in a supportive environment. This training not only improved their attitudes toward digital teaching methods but also enhanced their technological self-efficacy, leading to a higher likelihood of incorporating technology into their teaching practices.

Key findings emphasize that teacher trainees' technological-pedagogical self-efficacy covers subject mastery, effective communication, and proficient use of technology. For language learning, the results underscore that learning takes place in the learner's zone of proximal development, even in online environments, highlighting the need for teachers to be well-equipped to provide timely support. Designing an interactive learning environment that technically facilitates spontaneous questions was shown to be beneficial for learners.

Furthermore, the research's co-designed meta-artefacts, developed through iterative feedback cycles, includes comprehensive guidelines and best practices for managing online education settings. Despite the challenges in validating such an abstract tool, the meta-artefact demonstrates the potential for use in teacher training

and professional development, particularly in building competencies for online pedagogy and technological-pedagogical self-efficacy (TPACK).

Finally, insights from the co-design evaluation process indicate that the six-phase DSR process supports the continuous development of learning design by adapting to shifts in teaching attitudes and practices. While the meta-artefact is ready for implementation, further funding is required to integrate advanced features like automation, adaptability, and AI-based learning analytics.

## 5.4 Teacher Collaboration and Change in the Learning Community

In this sub-study IV, the focus was on examining teachers' collaboration and the impact of an entrepreneurial mindset on the social structure of online educators. The core of the study was a community of teachers that formed a social sub-artefact.

The research posed two key questions:

**RQ4a**. *What is required for teachers' collaboration in online training promoting the integration of adult immigrants?*

**RQ4b**. *How entrepreneurial features contribute to the social structure of online teachers?*

Interviews were used to delve deeper into the relevance cycle, gaining a better understanding of environmental factors. The interviewees were the core target group, namely teachers who work with the design daily. The interviewed teachers had been working with the artefact for two to six years at the time of the interviews and taught the Finnish language as well as partly work-related studies.

The research revealed that the teacher community functioned ideally as an entrepreneurial, dynamic, and collectively learning community; however, the findings also uncovered challenges within this model, highlighting areas of vulnerability in such a community structure.

The findings showed that teachers' collaboration and entrepreneurial mindset are key factors in the success of online education. Individual and collaborative resources, antifragility and resilience, and an entrepreneurial mindset help create a dynamic and learning community capable of responding to the challenges and opportunities of online education.

**Individual Resources**: Teachers observed significant benefits in online teaching, such as location independence and flexibility. This allowed work and study without daily commuting. Critical skills for online teachers included self-confidence, soft skills, and empathetic understanding of social needs. Teachers benefited from the

calm working environment and the ability to differentiate instruction. Although forming close relationships online took time, community and trustful interaction strengthened over time.

**Antifragility, Resilience, and Environmental Impacts**: The new online teaching environment required teachers to be flexible, learn new skills, and endure constant changes. Initial challenges included IT issues and building trust online. The workload increased rapidly, reducing creativity and enthusiasm. The pandemic tested teachers' uncertainty tolerance and risk-taking ability as they had to quickly adapt to changing online teaching while maintaining pedagogical quality.

**Collaborative Resources**: The virtual coffee chat acted as a virtual teachers' lounge, creating a sense of belonging and camaraderie. This informal space allowed for sharing personal and professional matters. Teachers preferred working in small teams to collaboratively plan future teaching. The informal nature of the chat encouraged creativity and innovation but required balancing participation and solitude.

**Entrepreneurial Mindset**: Teachers demonstrated entrepreneurial traits such as self-awareness, self-confidence, and motivation. The community encouraged risk-taking and seizing opportunities. Collaboration and an open-minded approach within the teacher community fostered innovation and trust. Technology required constant improvisation, and high-quality online teaching required a balance between structure and adaptability. Collaboration helped identify suitable methods and pedagogical solutions for distance learners.

# 6 Discussion

This research renews insights into education and learning research by focusing on the design and co-development of integration training implemented online. Drawing on design research, the themes significant to the study have been further refined. Moreover, examining the design of education and the practices of educational actors has brought to light areas for development that might otherwise have remained unnoticed. These research findings represent a real-world context and can therefore contribute to informed political decision-making.

My dissertation described how the online implementation of integration training grounded in communicative action can be designed and evaluated, and how the teacher's role in such training evolves. The focus was particularly on empathy-based design, co-design, and the roles of an entrepreneurial mindset and technological integration in the learning process. Additionally, the research examined how various learner backgrounds, such as low literacy and the lack of digital skills, can be effectively addressed in the design of inclusive online training.

Filling this research gap does not solve all the problems of integration training. However, it does provide an insight into the kind of future-oriented problem-solving needed in Finland's integration training field, given that the demand and pressure to organise training online is growing.

In this chapter, I have organised the discussion topics under thematic headings. Then, I discuss the limitations of the research. Finally, I summarise the discussion topics and offer suggestions for future essential research and provide recommendations for implementing online integration training in the future.

## 6.1 Designing for Inclusion: Empathy and Pedagogical Responsiveness

This research adopts an empathy-informed approach to pedagogical design, with particular attention to the needs, experiences, and perspectives of learners and teachers in online integration training.

Rather than positioning empathy as a separate methodological orientation, this research draws on principles of empathy-based design that focus on learners' abilities, needs, and timely support (Hashim et al., 2019; Fuller, 2012). In online

education, it is important to build opportunities for informal interaction in addition to actual teaching sessions, so that learners experience a sense of informality and can ask questions and discuss spontaneously. The teacher's role as a facilitator of interaction is central, and they must plan and implement various interaction opportunities. In addition, technological solutions must be easily accessible for both teachers and learners. To enable the teacher create a welcoming online education setting, the work environment must be comfortable and pleasant for the teacher.

This research challenges the assumption that online education is not suitable for learners with weak literacy skills. On the contrary, literacy and language skills can be studied smoothly online when education is designed according to the learner's digital skills and the teacher understands the learner's desire. Research has found that teacher-learner interaction and building a trusting relationship are crucial (Wang, 2014). An inclusive approach to online learning considers learners' diverse backgrounds and offers a meaningful pathway toward social participation and employment.

According to the literature, technology-mediated, interactive education can enable learners to network with peers (cf. Tseng & Yeh, 2013) and provide education and guidance related to language learning and employment. As such, teachers need to network with local employers and companies and support learners in networking within their own communities. Although the design of the learning environment should encourage employers to participate and interact directly with immigrants, so far, the teacher acts as a bridge between the learner and employers.

The findings from this research highlight that before experiencing online teaching, teacher trainees were sceptical about online learning (III). However, trainees noted that the technological design features had supported informal interaction and humour which in turn had helped to create a positive learning atmosphere. The use of interactive applications enabled intercultural communication (Mutahi & Gazda, 2019; Hung & Nguyen, 2022). For example, in this research, the use of videos, memes, and emojis were in constant use and had a significant impact on creating a positive atmosphere (Paper IV).

The teacher's role was especially important in the early stages, where teacher-led guidance (scaffolding) helped learners adopt new learning methods. As referenced earlier, when learners become familiar with the individual learning environment through guided support, responsibility gradually shifts to them (van de Pol et al., 2010). The background variables of participants participating in integration training vary significantly, as do their digital skills (Paper IV). For example, advanced computer users quickly adapted to the start of their studies, while those with weaker device skills took more time to orient themselves.

For teachers new to online education, the biggest challenge was familiarising themselves with the online teaching environment. This requires time and practice,

and new online teachers may initially find interaction situations uncomfortable compared to traditional classroom teaching (Papers III and IV). Over time, however, teachers learned to navigate these new dynamics, recognising that learners needed time to process spoken language, formulate responses, and engage actively in digital spaces. Experienced integration trainers were especially attuned to these needs.

DSR (Design Science Research) is inherently analytical and evaluative. This research integrates empathy-informed design thinking into DSR by focusing on how inclusive and responsive pedagogical approaches can be embedded in artefact development. The results of the empathy-based design are presented in the following chapters, where the concept is explored through the lenses of learner diversity, learning accessibility, technological integration, and the learning community.

### 6.1.1 Learning Design for Diversity

My research suggests that the effectiveness of online integration training for language and culture learning is shaped primarily by the availability of teacher and guidance resources, rather than by whether the training is delivered online or in person. Investing more resources into teachers for on-line education is important when there is a need to organise industry-specific and competency-based integration training over a wide geographical area. If the goal is truly to employ immigrants who have completed the training (FNAE, 2012; 2017; 2022), allocating resources to education and guidance should not be a problem.

The importance of building trust as a foundation for a successful learning process has been emphasized in prior research (Wang, 2014; Tseng & Yeh, 2013). Given this, teachers need time familiarise themselves with individuals so they can understand the learners' skills. Although in the short term this does not save teacher resources, in the long term resources are saved, especially if learners identify pathways to employment and can avoid repeatedly taking the same courses year after year. Additionally, tailoring individual learning paths helps learners achieve targeted outcomes and participate more actively, as noted in prior research (Bernacki et al., 2021).

My findings reveal that to promote learning, pedagogical discourse and providing opportunities for interaction are particularly challenging but essential for new online teachers. However, the online environment can facilitate the development of deep teacher-learner relationships, making this process more achievable. Differentiation online has proven to be effortless when learners from different fields and skill levels can be grouped across regional boundaries (V).

Teaching language and culture themes close to the learner's everyday life accelerates language acquisition. Profession-specific education is the best option for many, as their greatest dream is to find employment. Contents related to children's

lives and daily interactions in their communities can also provide the key to a successful learning experience and language development. Empathy-based technological design, combined with a strongly present teacher, promotes learning and community online.

It is well-documented that teachers of integration training are typically highly educated pedagogues qualified to teach specific subjects (Suomenopettajat Ry). Integration training prepares individuals for the workforce and active citizenship (FNAE 2012; 2017; 2022). My research highlights that when integration training is conducted online, the teacher's role shifts more to that of a facilitator and advisor rather than a traditional teacher. The teacher's task is to create communication opportunities, connect learners, and help them network and operate within their living environments.

### 6.1.2 Accessible Design

To ensure that learners could easily use the devices and log into them with minimal effort, the accessibility of technologies was designed to be user-centred (I, II, V). My research highlights that as a result of learners receiving comprehensive support to use the technology during orientation, the threshold for asking for help with IT problems was minimised. To ensure accessibility and inclusivity, the orientation for using the technology began at each learner's skill level, providing equal opportunities for everyone to progress (cf. Lowenthal & Lomellini, 2023). Additionally, context-appropriate dimensions for accessibility were defined: linguistic, pedagogical, and technological accessibility, to better identify whether the design was accessible to the user. Prior research also supports the value of continuous feedback collection during the course and responding to the feedback in the learning design benefits learners (Rienties et al., 2017). My research found that feedback from students was consistently used to select applications and modify and redesign the activities, interactions, and pedagogy to be more intuitive within the available applications (IV).

Previous studies have emphasised the importance of designing interactive and accessible online learning environments (Mutahi & Gazda, 2019) and to balance synchronous and asynchronous learning. For example, asynchronous spaces, such as always-available discussion forums, were found to amplify all voices and ensure the inclusivity of the learning environment (Cervatiuc, 2019). My research further suggests that group and individual guidance sessions help ensure that learning objectives are clear and understandable. Moreover, learning is supported by using translators and providing instructions to learners in their native languages.

The research highlights that online learners benefit from articulating the training environment, including the online learning platform, in the target language from the

outset. This practice not only enhances language acquisition but also improves learners' digital skills (IV), aligning with previous findings by Gibbons (2015). My findings emphasise that accessible and inclusive design must be embedded into the training from the outset, as suggested by Fennelly-Atkinson (2022). My research identified the dimensions of linguistic, pedagogical, and technological accessibility that are essential to consider in the design of learning environments. Prior research has noted that the needs of learners from diverse backgrounds must be addressed through these dimensions (Fennelly-Atkinson, 2022), while my findings underscore the crucial role of teachers as facilitators of interaction to ensure inclusivity.

When learning through technology, my findings show that technological accessibility is a key dimension, particularly in ensuring smooth navigation and functionality. Prior studies have noted the importance of linguistic and interactive accessibility in language learning, while pedagogical accessibility, as identified in my research, refers to the adaptability of education to an individual's learning culture. This includes designing integration training that accommodates learners' progression levels and zones of proximal development, as described in educational theory (Lantolf & Thorne, 2008). My findings further indicate that even experienced educators in integration training face the challenge of placing themselves in the position of a heterogeneous group of learners and considering how seemingly unattainable things can gradually become accessible to the learner.

In accessible online learning design, my research highlights the critical role of mediation and multisensory approaches, aligning with prior findings (Lantolf & Thorne, 2008). My research emphasizes that accessible design should incorporate clear text, intuitively perceivable visual layouts, and consistent design elements, even when created by different instructors. This ensures that learners can easily navigate and locate what they need on the screen. My findings also suggest that culturally sensitive design, including the use of appropriate colours, shapes, and clearly differentiated elements, enhances navigation and comfort. Furthermore, incorporating sound or speech into the design contributes to accessibility.

Finally, my research emphasises that learners' perceptions of the design are heavily influenced by how the teacher presents themselves within the online environment. This finding underscores the importance of teachers as active participants in creating a sense of accessibility and inclusivity in the learning experience.

### 6.1.3 Technological Integration and Capabilities

Technological skills are crucial for ensuring a seamless learning experience. The need for various online training programs will not disappear, even as the responsibility for integration training shifted to municipalities (Ruuskanen, 2024).

Integration services are becoming more digitalized to offer targeted training, such as vocational or academic language education, across regional boundaries (MEAE, 2024). Additionally, there will be a mandatory final test for integration training, conducted in a digital learning environment (FNAE, 2024). My research emphasises that this shift necessitates the inclusion of digital skills training in the curriculum, as learners must be prepared to log in, navigate, and succeed in such an environment.

My findings suggest that technology serves not only as a tool for interaction but also as a medium for conveying emotions, information, and connection. For many learners, their first encounter with online education can be intimidating and uncomfortable because it raises numerous questions about usability and accessibility. My research argues for a shift from technology-centric thinking to a learner-centred approach, emphasising the type of learning required and the usability needs of learning tools. Similarly, technological design must be approachable for teachers. Prior research underscores the importance of teacher induction and guidance in using online applications (Badia et al., 2018), and my findings confirm that these elements play a significant role in fostering teacher confidence and effectiveness.

It is well-documented that new teachers require time to familiarize themselves with integrating technology and pedagogy in a new environment (Badia et al., 2018). My research builds on this, showing that when teachers bring their individual resources into the digital community and begin to collaboratively develop teaching practices, their strengths and potential become more apparent. Technology facilitates informal communication channels and provides quick ways to seek support from the community. Additionally, unified teaching practices, as identified in my research, enhance mutual assistance and collaborative planning among teachers, continuously improving their technological-pedagogical self-efficacy.

The development of teachers' competencies is a critical focus of teacher education programs. As highlighted by the Digital Competence Framework for Educators (Redecker, 2017), comprehensive training that integrates technological and pedagogical skills is essential. This framework provides a structured foundation for supporting teachers in using digital technology not only as a technical tool but as a means to innovate and enhance educational practices. However, while the framework emphasizes technological proficiency, my research suggests that its components must always be contextualized with pedagogy and the specific skills being taught. Furthermore, I argue that it is essential to evaluate the relevance of digitalization in acquiring particular skills to ensure that learning remains meaningful and effective.

In integration training, my research demonstrates that tools and platforms must be chosen based on learners' skills and requirements, linking to active citizenship in a digital society. Learners need access to platforms that clearly display daily

schedules, offer chat functionality for communication with peers and teachers, and provide online classroom spaces. Since such comprehensive systems were not available in 2015, my research shows that practical solutions were built using popular and affordable applications already familiar to users. While these systems could not be technically integrated, manual efforts such as linking and guiding, created user-friendly learning environments tailored to the demands of specific groups. My findings further suggest that an ideal system would incorporate interactive features, learning analytics, and adaptability, guiding both learners and teachers according to their individual desire and preferences.

### 6.1.4 Entrepreneurial Learning Community

The teacher community that emerged online in 2015, as explored in sub-study IV, has been flexible and innovative from the outset, as it was not reliant on traditional face-to-face interactions. My research highlights that this community exhibited a strong culture of collaboration and entrepreneurial thinking, meaning that teachers shared knowledge, ideas, and resources with one another. This continuous innovation supports learner-centred education and professional development. Teachers possess advanced Technological Pedagogical Content Knowledge (TPACK), which combines subject matter, pedagogy, and technology, enabling effective online teaching.

The community places a strong emphasis on social and emotional support. My findings indicate that informal discussions, such as the virtual "coffee chat," and mentoring models foster a sense of community and provide emotional support to teachers. Additionally, the community is highly adaptable and responds swiftly to changes and new challenges, which is particularly important in online education, where technologies and learners' demands can evolve rapidly. Continuous feedback collection and its use in improving practices ensure that the community stays up-to-date and can offer the best possible support and education.

From the teachers' perspective, the design encouraged them to act entrepreneurially: to take risks, be curious, and continuously reflect on their work (Gibb, 2005). As a result, teachers' technological-pedagogical self-efficacy grew continuously, along with their collective TPACK knowledge. The mentoring structure fostered natural peer learning and collaboration. Although building interaction and trust in online design requires significant resources, my findings indicate that this investment resulted in a flourishing community (Leoz & Petter, 2018), where learners, teachers, and support staff formed a vibrant, dynamic, and entrepreneurial community.

Previous research has suggested that integration trainers will increasingly need to work with actors from other institutions in the future (Montonen & Lappalainen,

2017). There has been concern that as teachers move into the corporate world, they will turn into consultants (Kurki et al., 2017; Montonen & Lappalainen, 2017). My research, however, presents a market-based integration training teacher community whose teachers identify as educators (cf. Montonen & Lappalainen, 2017), despite continuously developing work-oriented online training as a team and as a learning community. As the research results show (IV), however, teachers' work resources are extremely stretched, with group sizes having to be increased due to price competition. It is clear that as group sizes grow, teachers have less time to focus on high-quality individualized teaching, planning, and guidance. Not only does this weaken learning outcomes, but also negatively impacts the success metrics of training, such as language proficiency and subsequent placement (employment) and feedback as well as teachers' perceptions of their own efficacy and well-being. It is therefore paramount that teachers' workloads are not further tightened but rather that the long-term effects are better recognized and investments made in smaller group sizes and individualized learning. Teachers' well-being can be improved by providing adequate resources and support, such as native language guidance, and creating community environments where teachers can share experiences and learn from each other.

The social and emotional aspects of teaching are well-documented to influence the effectiveness of collaboration among teachers (Yeh et al. 2021; Badia et al. 2018). My research supports these insights, highlighting that trust, empathy, and a willingness to collaborate among teachers lead to new innovations and rapid development. Previous studies note that the work community benefits from humble leadership (Ho & Bryant, 2020), where teachers are trusted and given the freedom to ideate, sufficient resources to operate and experiment with new ideas, and personal support to address challenging situations, uncertainty, and unexpected changes or when the workload becomes too heavy.

My research demonstrates that when the collective potential of teachers is harnessed, the community works motivatedly and efficiently in teaching and is keen to develop it collaboratively. The community places a strong emphasis on social and emotional aspects, recognizing the importance of trust, empathy, and community among teachers. Informal interactions, shared experiences, and collective emotions play a significant role in maintaining a supportive and resilient community.

## 6.2 Limitations and Generalisability

The limitations of the research pertain to factors that affect the generalisability and interpretation of the results. Firstly, the sample size was limited, which may restrict the generalisability of the findings. The limitations of the research pertain to factors that affect the generalisability and interpretation of the results. The sample might not

represent all immigrant groups or educational environments, and the composition of the sample, such as age, gender, educational background, and language proficiency, may be imbalanced, potentially influencing the findings. Additionally, since DSR (Design Science Research) is conducted in real-world settings, the entire research process cannot be pre-planned in a predetermined manner. The iterative nature of DSR allows for adjustments and improvements to be made in subsequent iterations, making it possible to address unforeseen challenges and refine the research outcomes over time.

Data collection methods, such as interviews, surveys, and observations, are susceptible to subjective perspectives and interpretations that may affect the objectivity of the findings. Self-assessments and surveys, in particular, might contain respondents' biases and expectations, which could distort the results. Additionally, the reliance on technology-based learning solutions represents a limitation, as their suitability and usability may vary greatly depending on the users' technological literacy. The accessibility of technology and infrastructure (such as internet connectivity) can also vary, affecting users' ability to participate in education.

Another limitation relates to the diverse cultural backgrounds and levels of language proficiency among immigrants. This can influence how they experience and benefit from empathy-based learning solutions. For example, the quality and availability of linguistic support services can vary, impacting learning outcomes. In addition, the research was conducted in Finland, so the generalisability of the results to other countries and cultures may be limited. Differences in educational systems and policies can also affect how well the findings and recommendations apply to other contexts.

The duration of the research might also limit the assessment of long-term effects. Changes in learners' career paths and integration may only become apparent over the long term, and the lack of continuous follow-up might prevent precise conclusions about the long-term impacts of the education. Methodological limitations relate to the subjective nature of the analytical methods used, such as thematic and content analysis, which can affect the interpretation of the results. Additionally, the application of the DSR method might limit the use of some traditional qualitative or quantitative research methods.

Based on these limitations, future research should expand the sample size to include various immigrant groups and larger sample sizes to make the findings more generalisable. By utilising a mixed-methods approach that combines qualitative and quantitative methods the comprehensiveness and reliability of the findings could be enhanced. Long-term follow-up studies are necessary to evaluate the long-term effects of education on learners' integration and career paths. Cross-cultural comparisons in similar integration training programs in different countries and cultures are needed to understand how the findings and recommendations apply to

different contexts. Additionally, developing and evaluating technological solutions that are more accessible and user-friendly for diverse learner groups is an important future research topic.

## 6.3 Trustworthiness of the Research

The trustworthiness of this research has been considered throughout the research process in alignment with principles of qualitative research and design-based methodology. Given the nature of design science research (DSR), the evaluation of trustworthiness requires attention to both the quality of the design artefacts and the rigour of the research process itself. The following dimensions—credibility, transferability, dependability, and confirmability—are used as a guiding framework to assess the trustworthiness of the study (Lincoln & Guba, 1985).

Credibility refers to the plausibility and truthfulness of the findings. This research's credibility was strengthened through prolonged engagement with the field and iterative data collection across multiple phases of artefact design and implementation. The use of triangulation—across data sources (e.g. teacher interviews, learner feedback, design artefacts), methods (e.g. co-design workshops, surveys, document analysis), and perspectives (teachers, learners, institutional stakeholders)—ensured that interpretations were grounded in diverse viewpoints. Member checking was conducted informally throughout the co-design process, as participants had opportunities to reflect on and react to preliminary interpretations in workshops and follow-up sessions.

Transferability relates to the extent to which the findings may be applicable in other contexts. While this research focuses on the Finnish integration training system, the detailed description of the educational context, artefact design process, and participant backgrounds allows readers to make informed judgments about the relevance of the findings to other settings. The emphasis on pedagogical accessibility, teacher agency, and collaborative design offers principles that can be considered in other adult education or integration training contexts, especially where digital delivery is being explored.

Dependability concerns the consistency and stability of the research process. The research followed a clearly documented process through its six-phase design model (see Chapter 4.3), ensuring traceability between research objectives, artefact iterations, data sources, and analytic procedures. All phases of the research were recorded through design logs, workshop documentation, and analytic memos. Changes in design or research focus were always linked to empirical developments and systematically documented.

Confirmability addresses the degree to which the findings are shaped by the participants and the data, rather than researcher bias. To support confirmability, the

research maintained an audit trail of design decisions and analytic interpretations, making explicit the iterative reasoning that led from data to findings. Reflexive awareness was integrated into the research process, particularly in the dual role of the researcher as both facilitator and investigator. Potential biases were addressed through peer debriefing and critical discussions with co-authors and supervisors throughout the project.

In summary, the trustworthiness of the research has been supported through methodological transparency, iterative engagement with participants, and continuous reflection on the evolving role of design in shaping both knowledge and practice. The use of design science research as a framework allowed for a dynamic and context-sensitive inquiry while maintaining systematic rigor in data collection and interpretation.

## 6.4 Recommendations for Practitioners

As responsibility for integration training in Finland shifted to municipalities in 2025, many municipalities have needed to develop new educational infrastructures and service ecosystems to support integration. The need remains for both classroom-based and online implementations. Based on these recommendations, education designers can consider key issues in designing integration training. The recommendations apply not only to online implementations but also as tools for organising classroom implementations. These recommendations benefit a wide range of practitioners, including teachers, education designers, integration coordinators, technology developers, policymakers, mentors, and researchers, by providing actionable strategies for creating effective, inclusive, and sustainable integration training programs

1. **Empathy as a design orientation**: The design should consider learners' individual requirements and backgrounds, and their empathetic identification. Interaction situations should be built so that learners feel comfortable and confident. Here, the role of teachers is crucial role in guiding and encouraging interactions.
2. **Technological Integration and Support**: Technological tools should be prepared and configured in advance so that learners can use them easily without complex logins. Continuous technical support is essential, and learners should be offered personal guidance when needed. Technological solutions should be scalable and durable.
3. **Teacher Training and Support**: Teachers should be provided with continuous professional development and support in developing technological and pedagogical skills. Microcredentials are an effective way

to complement skills. Teachers' entrepreneurial mindset, such as risk-taking, curiosity, and continuous self-reflection, should be encouraged. Mentoring and peer learning models support teachers' professional development and collaboration.

4. **Cultural Awareness and Multilingual Support**: The design and implementation of training should consider learners' multicultural backgrounds. Cultural sensitivity helps build trust and promote learning. Providing multilingual support allows learners to receive study support in their native language, facilitating understanding and engagement.
5. **Social and Emotional Support Structures**: A virtual community is important, and informal discussions and shared experiences foster a sense of belonging and support the well-being of teachers and learners. Building trust and empathy between teachers and learners is key, and this can be achieved by providing continuous support and resources.
6. **Long-Term Impact Monitoring**: Tracking learners' career paths and quality of life after training helps assess the long-term benefits and impacts of the training. It is important to be open to unexpected learning outcomes, because the goals were based on traditional training but emerged due to the novel pedagogical integration and co-design of the technological learning environment. Educational policies and strategies should utilize research findings, especially emphasizing the importance of empathy-based and accessible digital learning solutions. Comparing different policy models and strategies and evaluating their impacts can provide valuable information for decision-making. Currently, long-term follow-up data is sparse and scattered, even from the perspective of national indicators.

These recommendations offer a comprehensive approach to help education providers, teachers, and policymakers create effective and accessible integration training programs that support the success of learners and teachers in a digital learning environment.

# 7 Conclusions and future research directions

This research demonstrates that an empathetic approach to design significantly enhances the accessibility and effectiveness of online integration training, fostering inclusive learning environments that accommodate diverse learner needs.

An empathetic approach to design is foundational in enabling universal access to participating in online learning. When learners of all backgrounds are invited to join the learning community, understanding diversity—including different cultures, educational backgrounds, and functional capacities—is essential. With sufficient knowledge about diversity, it becomes possible to create an accessible learning design. This process requires integrating technologies and usability considerations that account for individual learning backgrounds and demands. At its best, successful design fosters a thriving, entrepreneurial learning community.

Technological development is an essential part of the future of integration training. Utilizing new technologies such as artificial intelligence, virtual reality, and mobile applications can significantly improve learning experiences and outcomes. Continuous technological advancements offer opportunities to create increasingly diverse and accessible learning solutions that meet the requirements of various learner groups. Researching and implementing these innovations are key factors in developing sustainable and scalable integration training. Applying artificial intelligence in online training, especially in the context of personalised support and teaching, is a growing research area. The ethical and practical impacts of artificial intelligence on education and learning also require attention.

The impact of social and emotional support structures on the well-being and learning outcomes of learners and teachers requires deeper research. Developing new social and emotional support strategies and evaluating their impacts are necessary steps. Future research should examine the impact of collaborative networks on the success of integration training. Peer learning and collaboration with other learners can significantly support learning. Studies could focus on the formation of networks and their effects on learning experiences and outcomes. The long-term effects of empathy-based design on learning outcomes and well-being also require deeper examination.

Cultural awareness and consideration of multiculturalism are important research areas. Teachers' cultural awareness and ability to engage with diverse learners can impact the quality of education. The impact of multilingual support on learning outcomes and learner engagement should be studied in more detail. Comparing different multilingual learning models can provide valuable information on their application in various cultural and linguistic contexts. The development of technological self-confidence in teachers and learners and its effects on learning environments are also important research topics.

Entrepreneurial skills are one key area of research. Integration training should explore how the entrepreneurial abilities and competencies of integration trainers and trainees can be promoted. This can support immigrants' employment and active participation in society, providing them with new economic opportunities.

The sustainability and scalability of the educational model are crucial for long-term success. It is important to research how current online teaching models can be geographically expanded to new areas and target groups. Utilizing research findings in the development of educational policies and strategies is important. Emphasizing empathy-based and accessible digital learning solutions can create new policy models that support the integration and inclusion of immigrants. Comparing different policy strategies and evaluating their impacts can provide valuable information for decision-making. Follow-up studies on learners' career paths and quality of life after training offer insights into long-term benefits, supporting the development of new innovative practices.

By addressing these areas, future research can build upon the foundations laid by this dissertation, contributing to the development of more effective, inclusive, and sustainable integration training models that meet the diverse needs of learners and support their successful integration into society. Two key research directions include exploring how emerging technologies can be effectively integrated into online integration training to enhance personalised support, learner engagement, and accessibility. Additionally, future studies should examine the long-term impacts of empathy-based design on learning outcomes, well-being, and the societal inclusion of learners, to provide insights that can inform the development of scalable and sustainable integration training models.

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