

Digital Literacy and Resilience: How Can Professional Development Prepare Instructors to Succeed in Changing Times?

by

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COMMITTEE APPROVAL

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**Abstract**

Digital literacy is essential for societal participation, making it a crucial aspect of an educator's role. The importance of digital literacy corresponds with the rising demand for postsecondary digital education in Canada, alongside numerous changes from COVID-19, demographic shifts, and technological advancements, requiring educators to be resilient. However, there is a lack of data to inform decisions about instructor professional development. In this qualitative study, I investigated how digital literacy professional development can enhance the digital resilience of technical and vocational education and training (TVET) instructors in British Columbia. The technology acceptance model provides a context for understanding instructors' motivation to enhance digital pedagogy. I collected data through ten semi-structured interviews with faculty developers and instructors. Thematic analysis resulted in four key themes: the breadth of instructors' needs and competencies, TVET-specific professional development, critical digital literacy, and meaningful connections for resilience. The findings include recommendations and strategies for instructors, institutions, and provincial accreditation bodies to consider for future TVET instructor professional development initiatives.

*Keywords:* TVET instructors, digital literacy, professional development, digital resilience, digital pedagogy

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## **Chapter 1: Study Background**

The use of digital technology has become an everyday occurrence, and its proficient use is emerging as essential for empowered citizenship and education (B.C. Digital Learning Advisory Committee, 2023; Basilotta-Gómez-Pablos et al., 2022; Marín & Castañeda, 2023). Given this reality, digital literacy (i.e., the appropriate and efficient use of digital technology) is crucial, and there is increasing demand for the integration of digital technology in postsecondary education (B.C. Digital Learning Advisory Committee, 2023; Basilotta-Gómez-Pablos et al., 2022; Bates et al., 2017). However, there is a lack data to inform decisions about developing instructor training to support effectively integrating digital tools with teaching methods. Therefore, through my research I aim to inform future professional development that prepares instructors to teach in a digital age, specifically in the context of technical and vocational education and training (TVET) in British Columbia. I investigate instructors' challenges and shed light on professional development approaches that enhance instructors' digital resilience.

### **Digital Literacy**

Researchers widely acknowledge digital literacy an essential skill given its pivotal role in enabling individuals to participate in society (B.C. Digital Learning Advisory Committee, 2023; Marín & Castañeda, 2023), making it a vital aspect of an educator's role. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2022), digital literacy is considered a fundamental right in the 21<sup>st</sup> century. Digital literacy encompasses the ethical and effective use of digital technologies, tools, and communications across diverse work, education, and social contexts (B.C. Digital Learning Advisory Committee, 2023; Marín &

Castañeda, 2023). The recent COVID-19 pandemic heightened society's need for digital literacy, forcing a shift in education to emergency online teaching and learning, impacting all aspects of postsecondary education systems (B.C. Digital Learning Advisory Committee, 2023; Romero-Hall & Cherrez, 2022). In higher education, instructors play a pivotal role in integrating digital technologies into teaching methods, strategies, and approaches, collectively known as pedagogy, making digital literacy a critical aspect of their role (Basilotta-Gómez-Pablos et al., 2022; Martin et al., 2022; UNESCO, 2022; Weller et al., 2013). Postsecondary education faces numerous changes, not just from COVID-19 but also demographic, technological, and societal changes (Romero-Hall & Cherrez, 2022; VanLeeuwen et al., 2020).

### **Digital Education**

Increasingly, the importance of digital literacy corresponds with the rising demand for digital education and related services in postsecondary education in Canada (B.C. Digital Learning Advisory Committee, 2023; Basilotta-Gómez-Pablos et al., 2022; Bates et al., 2017). Digital education refers to a broad range of teaching and learning approaches that use digital technology, including in-person, blended, and fully online contexts (Bates et al., 2017; VanLeeuwen et al., 2020). Veletsianos et al. (2021) analyzed surveys of higher education institutions in Canada from 2017–2019 and claimed that there had been an increasing demand for digital education over the previous decade. The authors identified that most Canadian higher education institutions offer online and blended courses. This growth in digital education can be attributed to factors such as the increasing student demand for flexible learning options and improved accessibility, advancements in digital teaching technologies, and the recognition of

potential benefits such as enhanced student outcomes and cost management for institutions (Veletsianos et al., 2021). Furthermore, Veletsianos et al. (2021) emphasized the growing importance of faculty in the development of digital education, prompting Canadian postsecondary institutions to focus on enhancing faculty skills and knowledge in this regard because faculty are an essential factor in the growth and development of digital education.

Likewise, Basilotta-Gómez-Pablos et al. (2022) emphasized the global need to support instructors in effectively integrating digital tools with new pedagogies, especially for in-service instructors (i.e., instructors who are actively teaching). Brown et al. (2020) highlighted the urgent requirement for faculty professional development in Canada concerning the use of digital technology in education. Johnson (2019) investigated professional development for online teaching in Canada prior to the 2020 COVID-19 pandemic and found the top barriers to online learning were related to faculty effort, inadequate faculty training, and the acceptance of online learning by faculty. It is crucial for pedagogical training to extend beyond technology skills to help faculty understand the relationship between technology and pedagogy (Brown et al., 2020). In addition, Cooney (2019) suggested providing thoughtful support for experienced faculty to enhance their effectiveness in teaching in digital environments, considering that their specific needs and expectations may differ from those of new faculty. The requirements for professional development among faculty differ based on the subject area, the instructor's previous experience and career stage, and course modality (VanLeeuwen et al., 2020). It is important to recognize that faculty development needs are contextual, and approaches should be shaped by various factors such as culture and discipline (Marín & Castañeda, 2023).

### **Relevance of Professional Development**

Considering the importance of context, the need to enhance how digital technology is used in postsecondary education is particularly relevant in practical and experiential training programs, such as TVET (Basilotta-Gómez-Pablos et al., 2022; Marín & Castañeda, 2023; UNESCO, 2022). Additionally, UNESCO (2022) identified the need for TVET digital skills and competencies in a study that spanned several countries and claimed that TVET instructors face multiple challenges using digital tools and embracing digital education opportunities. Moreover, Kanwar et al. (2019) highlighted that TVET instructors need technical and digital skills along with a paradigm shift in traditional TVET teaching to embrace digital pedagogies—to shift from instructors to facilitators. In TVET, instructors and learners will need continual upskilling to keep up with industry changes, unforeseen technology advances, and the changing roles of instructors (Douse & Uys, 2019; Kanwar et al., 2019). To enhance TVET teaching practices, faculty must be supported to incorporate technology into their practice, and educators need advanced educational technology training, yet research on digital competence in TVET is scarce (Cattaneo et al., 2022; Kanwar et al., 2019a; Vinden, 2020; Vogt, 2014). To make evidence-based decisions regarding initiatives and investments in digital literacy professional development, it is necessary to gather more data (Brown et al., 2020; Carter et al., 2014).

In addition, while digital literacy and digital education have received attention for decades, with a focus on competency and confidence, more recently, there has been a shift toward promoting instructors' resilience and well-being (Passey, 2021; Wosnitza et al., 2018). B.C.'s Post-Secondary Digital Learning prioritizes educators' digital literacy and wellness across

all postsecondary environments, taking into account factors such as workload, safety in digital spaces, and professional development opportunities (B.C. Digital Learning Advisory Committee, 2023). Educators must be resilient and adaptable to sustain their well-being while adapting to changes in evolving digital technologies and the impacts of COVID-19 (Romero-Hall & Cherrez, 2022; Weller et al., 2013). Liu et al. (2022) suggested that teacher resilience is influenced by teacher competence in online teaching, implying that improved digital competence may lead to greater resilience in the face of adversity. As individuals integrate resilience into their digital competencies, it is likely to positively affect their performance, health, and well-being (Cassidy, 2016).

Numerous definitions of instructor resilience exist in the literature, which involves a range of cognitive, emotional, and behavioural factors that enable teachers to cope with stress and maintain well-being in the face of adversity (Barnová et al., 2023). In a study of public primary schools in Barcelona, Spain, Clarà (2017) characterized teacher resilience as the ability to positively adapt to challenging circumstances. Drew and Sosnowski (2019) proposed a new theory of teacher resilience in their study of postsecondary education in the US, defining it as the ability to adapt to and cope with demanding work conditions. They emphasized that resilience is a dynamic process influenced by both individual and contextual factors; resilience can be developed and strengthened over time through various strategies such as seeking social support, engaging in self-care activities, and developing coping skills. They claimed resilience is not a fixed trait but a set of skills and behaviours that can be learned and fostered through experience and practice. Kärner et al. (2021) introduced the concept of resilience competencies, which they

described as individuals' capacity to handle work-related demands and uphold well-being. These competencies encompass three aspects: adaptability (flexibility), receptiveness to change (dynamics), and rapid recovery (resistance). I recognize the complexity of the broad concept of resilience; consequently, the focus of this study is to explore digital resilience specifically, as discussed in Chapter 2.

Digital resilience, as an aspect of resilience, concerns an individual's readiness to adapt to various digital environments (Eri et al., 2021; Sun et al., 2022). Before the COVID-19 pandemic disrupted education, digital resilience was mainly linked to the information technology sector, particularly concerning cyber safety and security for organizations and institutions (Sun et al., 2022). However, Eri et al. (2021) expanded the concept of digital resilience to include the preparedness of learners and educators to overcome technological challenges, persist, and adapt to changes in higher education. Since the worldwide COVID-19 pandemic, the growing use of digital technology has resulted in a rise in webinar fatigue, technology-use anxiety, and digital burnout, primarily because of the challenges of maintaining clear work–life boundaries (Sun et al., 2022). Whereas digital literacy is about understanding and using digital tools wisely and responsibly, digital resilience goes a step further, encouraging changes in behaviours and attitudes to better navigate stress in digital environments (Sun et al., 2022). Sun et al. (2022) conducted a thematic literature review and noted that, although instruments such as the Connor–Davidson Resilience Scale (Connor & Davidson, 2003), the Resilience Scale for Adults (Friborg et al., 2003), and the Brief Resilience Scale (Smith et al., 2008) exist to measure general

resilience, they suggested that no specific instruments are currently available to measure digital resilience in individuals, particularly within educational settings.

Ang et al. (2022) conducted a systematic review of digital training aimed at building resilience to identify essential features for designing effective programs. Their broad study, spanning several countries and involving participants from diverse backgrounds, provided insights into individual resilience. They noted that existing general resilience scales typically rely on self-reported measures of an individual's perceived ability to cope and recover from adversity. While self-reported scales are easy to administer, they are limited by social desirability bias (responding in a way perceived as favorable) and recall bias (difficulty remembering past events) (Ang et al., 2022). The authors suggested that objective measures, such as biomarkers like salivary cortisol, could be valuable but are not widely adopted due to the high costs and complexity involved in collection and storage (Ang et al., 2022). As an alternative, Ang et al. (2022) proposed using indicators such as anxiety, depression, and stress symptoms to assess how individuals recover from adversity, offering a broader perspective beyond just measuring resilience. The study recommends further research to develop more specific and objective tools for measuring digital resilience.

In their systematic review, Ang et al. (2022) concluded that digital training significantly enhances resilience. They identified key components of effective digital resilience training based on American Psychological Association guidelines, which include: (1) cognitive flexibility, (2) optimism and cognitive appraisal, (3) problem-solving, (4) relationships, (5) self-efficacy, (6) self-esteem, and (7) self-regulation and coping. Essential features of digital resilience training

incorporate techniques such as cognitive flexibility, problem-solving skills, self-regulation, and fostering an optimistic mindset. Effective digital resilience training helps individuals build strong social support networks, equipping them to better cope with adversity and reduce symptoms of anxiety, depression, and stress. Evidence suggests that these approaches can improve overall mental health and resilience (Ang et al., 2022).

Similarly, Tran et al. (2020) confirmed a positive relationship between digital literacy and digital resilience, correlating with higher resilience levels. The challenges of digital overload, stress from digital mishaps, and negative experiences in new digital environments significantly impact individuals (Sun et al., 2022). Therefore, professional development programs for instructors must focus on building digital resilience to help them manage these challenges (Sun et al., 2022). This broader understanding of digital resilience reveals a gap in postsecondary education. Houlden and Veletsianos (2020) noted that COVID-19 exposed the unpreparedness of postsecondary education for a digital shift and highlighted the need to foster resilience in times of uncertainty.

### **Research Questions**

Consequently, in this study I explore how instructor digital literacy might prepare educators for the challenges they face in their profession and support instructor well-being, specifically within the context of TVET in British Columbia. The main research question guiding this study is: How can digital literacy professional development be designed to enhance the digital resilience of TVET instructors in British Columbia? To address this central question, I will explore several sub questions: What are the digital literacy needs and competencies of

TVET instructors? What are the digital education requirements of TVET institutions? What are the key features of digital literacy that will prepare TVET instructors to succeed while also supporting digital resilience?

### **Definition of Key Terms**

In this section I clarify and define the terms used in this paper.

*Digital education* refers to teaching and learning activities that make use of digital technology as part of in-person, blended, and fully online learning contexts (VanLeeuwen et al., 2020).

*Digital literacy* is a person's knowledge, skills, and abilities for using digital tools ethically, effectively, and within a variety of contexts to access, interpret, and evaluate information, as well as to create and construct new knowledge, and communicate with others (B.C. Digital Learning Advisory Committee, 2023).

*Digital competence* encompasses digital literacy and the practical application of digital skills. It involves safe and critical use of digital technologies for learning, working, and participating in society, including skills in data literacy, communication, media literacy, digital content creation, digital security and well-being, intellectual property, problem-solving, and critical thinking (Europaea, 2018).

*Instructor resilience* refers to the ability to positively adapt and commit to professional growth despite challenges. It is influenced by individual, situational, and contextual characteristics providing either risk or protective factors. Muller et al. (2011) examined resiliency among pre-service and public-school K-12 teachers to describe six protective factors

that are important in maintaining resiliency in teachers as (a) purpose and expectations, (b) nurture and support, (c) positive connections, (d) meaningful participation, (e) life guiding skills (personal skills and strategies that help teachers manage stress and balance their professional and personal lives) and (6) clear and consistent boundaries. With access to personal, professional, and social resources, instructors can not only recover but also thrive, experiencing job satisfaction, self-belief, well-being, and sustained commitment to their profession (Wosnitza et al., 2018).

*Digital resilience* is the ability of individuals or organizations to identify and handle the risks and threats encountered while socializing, exploring, or working online, playing a crucial role in overcoming challenges in digital technology (Sun et al., 2022). Within educational contexts, the concept has broadened to encompass how learners and educators prepare to persist and adapt to technological challenges, and to navigate different or evolving digital environments (Eri et al., 2021). Sun et al. (2022) conceptualized digital resilience as “a circular process toward greater well-being in the form of behavioural performance and psychosocial functions when faced with threats, challenges, or adversity during the use of technologies” (p. 1). They identified five key attributes of digital resilience: understanding online threats, knowing solutions, acquiring knowledge and skills, recovering from stress, and advancing through self-efficacy.

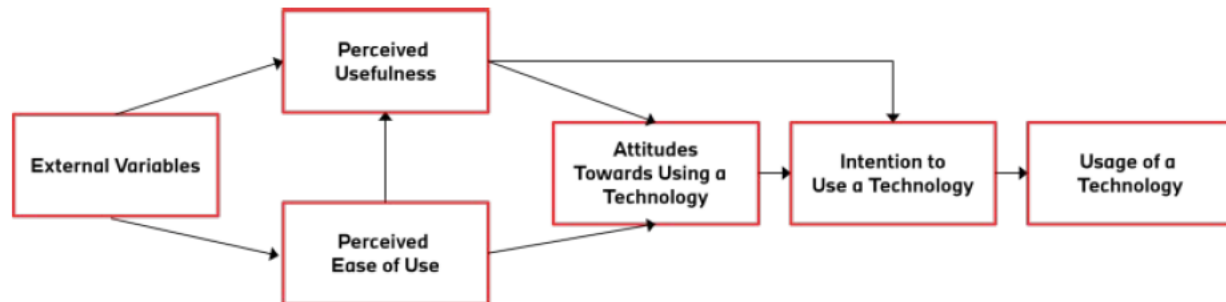
TVET offers education, training, and skills development for a wide range of occupations and sectors, often referred to as trades training in British Columbia. Vocational education aims to prepare students with skills for a specific craft, such as carpentry, plumbing, or hairdressing (Van Houtte, 2010). Available at multiple educational levels, TVET includes work-based learning and

ongoing professional development leading to qualifications while promoting lifelong literacy, numeracy, and citizenship skills tailored to local and national contexts (UNESCO, 2015). In B.C., SkilledTradesBC, formerly known as the Industry Training Authority (ITA), is a public sector organization funded by the B.C. government. It oversees skilled trades training, certification, and the apprenticeship system. (SkilledTradesBC, 2023). SkilledTradesBC sets the standards for programs, including classroom hours, duration of on-the-job training, program content, assessment strategies, and certification exams (SkilledTradesBC, 2023).

### **Theoretical Framework**

The technology acceptance model (TAM) is the theoretical framework used in this study to investigate the needs of TVET educators in B.C. and inform how digital literacy professional development can be designed to enhance their digital resilience. A theoretical framework provides the foundation for a study, offering a rationale for the problem statement, the formulation of research questions, the study design, and how a researcher interprets the data (Grant & Osanloo, 2014; Merriam & Tisdell, 2015). TAM provides a basis to explore factors such as perceived ease of use (PEU), perceived usefulness (PU), and behavioural intentions to use digital technology (Antonietti et al., 2022; Marangunić & Granić, 2015). Marangunić & Granić (2015) developed the TAM based on the theory of reasoned action by Ajzen and Fishbein (1975). The theory of reasoned action developed as digital technology was becoming an integral part of everyday life, and Ajzen and Fishbein (1975) looked at users' behaviour intentions and attitudes to gain an understanding of why technology is accepted or rejected (Marangunić & Granić, 2015). Subsequently, Davis (1989) extended the concept by introducing TAM, which

proposes that the user's motivation can be understood through three key factors: their perception of how easy the technology is to use, their perception of its usefulness, and their attitude toward its usage (Antonietti et al., 2022; Marangunic & Granic, 2015).

**Figure 1**

*The Technology Acceptance Model (Davis, 1989)*

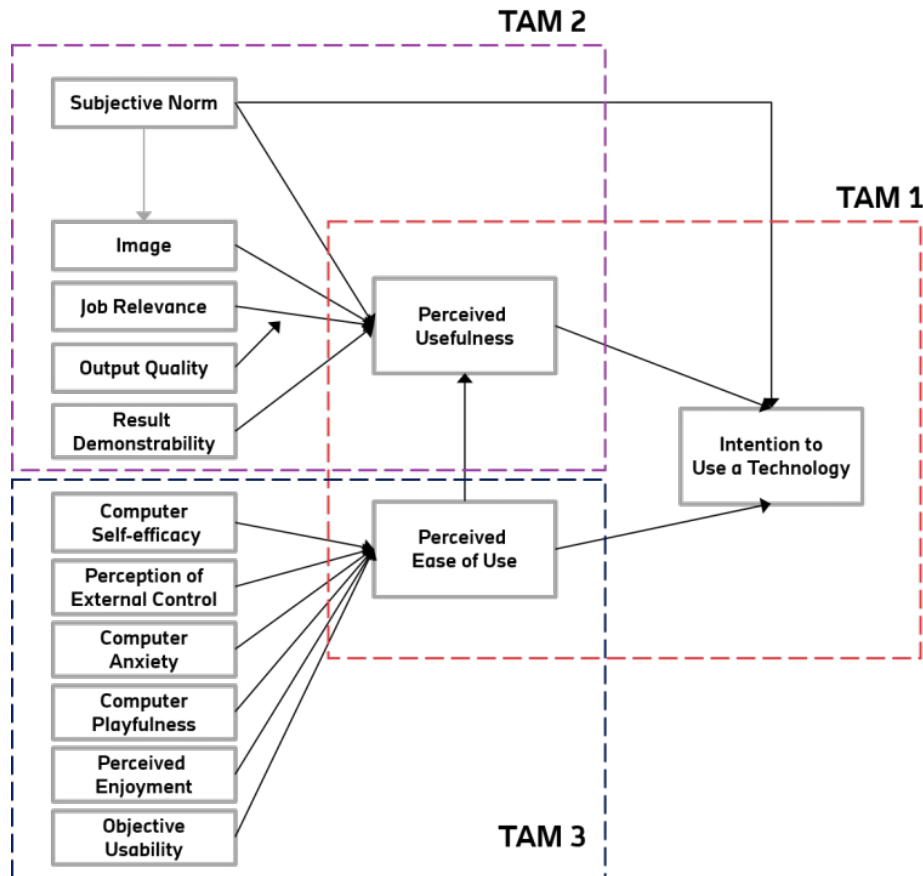
Note: The TAM predicts individual adoption in the workplace based on PU and PEU. PU describes the degree to which a person believes that their work performance can be increased by using technology. PEU refers to the perceived mental or physical effort required to use the technology. From *Technology Acceptance Model (TAM) – Innovation Acceptance Lab* by Stuttgart University of Applied Science, n.d. (<https://acceptancelab.com/technology-acceptance-model-tam>). Copyright n.d. by Stuttgart University of Applied Science. Reprinted with permission.

Davis and associates refined the TAM model (1996–2003) to replace *attitude* with *behaviour intention* because *attitude* did not fully explain PU and PEU (Marangunić & Granić, 2015). Additionally, they added external factors, referred to as *variables*, to the model. Importantly, Venkatesh (2000) extended the model, TAM 2, to identify two factors related to the variable *PEU*: anchors (general beliefs about computers) and adjustments (beliefs that are based on direct experience with the target system) (Marangunić & Granić, 2015). The TAM evolved to contend that people’s attitudes toward using technology are influenced by their beliefs regarding its PEU and PU, including external social factors (Marangunić & Granić, 2015; Venkatesh &

Bala, 2008). These attitudes, in turn, impact their intention to use the technology and ultimately determine their actual behaviour (Antonietti et al., 2022; Salleh et al., 2021). In 2008, Venkatesh and Bala expanded the model even further to develop a more complex model called TAM 3. This version acknowledges that an individual's decision to adopt technology is influenced not only by their own perceptions but also by social factors and external circumstances (Venkatesh & Bala, 2008). More recently, researchers have recognized trust and integrity as impacting PU and proposed they should be adopted into an extended TAM model (Rukhiran et al., 2023; Uche et al., 2021). Figure 2 illustrates TAM 1, 2, and 3 models.

**Figure 2**

*TAM 1, 2, & 3 – Simplified omitting moderators, Davis (1989); Venkatesh & Bala (2008); Venkatesh & Davis (2000)*



Note: The expanded TAM enhances the understanding of factors influencing technology acceptance (Antonietti et al., 2022; Marangunić & Granić, 2015). TAM 1 has two main factors: PU and PU. TAM 2 builds on TAM 1 to include social influences and an individual's cognitive processes (Marangunić & Granić, 2015). TAM 3 also expands TAM 1 by incorporating variables related to technology adoption beyond individual perceptions to include organizational factors and external influences within a broader context (Venkatesh & Bala, 2008). From *Technology*

*Acceptance Model (TAM) – Innovation Acceptance Lab* by Stuttgart University of Applied Science, n.d. (<https://acceptancelab.com/technology-acceptance-model-tam>). Copyright n.d. by Stuttgart University of Applied Science. Reprinted with permission.

### **Relevance of Technology Acceptance Model (TAM) for This Research**

I selected TAM for this research due to its wide applicability across various technologies and contexts and its repeated use in educational settings to assess teachers' willingness and motivation to integrate technology into their teaching method (Marangunić & Granić, 2015). As a theoretical framework, TAM was essential for my research on designing digital literacy professional development, providing a structured foundation that systematically connects to existing knowledge to understand and predict technology adoption behaviours among educators. By incorporating TAM, I systematically investigate the factors that motivate or hinder technology adoption, thereby developing implications for professional development programs. This approach not only supports the theoretical underpinnings of my study but also offers practical insights for enhancing the effectiveness of professional development initiatives.

Salleh et al. (2021) suggested that influencing teachers' beliefs about technology's PU and PEU is also important. TAM guides this research because it provides a basis to understand the various elements influencing teachers' willingness to integrate digital tools into their teaching practice, and this understanding is essential in creating effective teacher training programs (Antonietti et al., 2022; Salleh et al., 2021).

Researchers have not sufficiently explored the application of TAM to address teacher professional development in TVET (Antonietti et al., 2022; Salleh et al., 2021). This research

provided an opportunity for further investigation. Notably, both TAM's application in education and its research methodology have faced criticism, as outlined in the limitations.

### **Limitations and Delimitations**

This research was constrained by several limitations and delimitations, including: (a) generalizability, (b) time, (c) positionality, and (d) the TAM limits.

### **Generalizability**

There are two types of sampling: probability (i.e., random sampling that allows the researcher to generalize results to the general population) and non-probability sampling (Merriam & Tisdell, 2015). In qualitative research, the aim is not to take a broad view of the study results in a statistical sense (Merriam & Tisdell, 2015). Instead, researchers typically use purposeful sampling to gain insight from a selected sample from whom the most can be learned due to their particular experience and competence (Merriam & Tisdell, 2015).

In this study, I used purposeful sampling to gain insights from a selected group of experienced participants from public postsecondary institutions within the TVET context in B.C. It is important to note that the findings are not intended to be generalizable to all postsecondary educators and TVET training providers. The scope of this research is intentionally limited to public postsecondary institutions, and I do not aim to represent non-public institutions, school districts, or the entire TVET context in B.C. I established this delimitation to maintain a manageable scope and depth of analysis, ensuring a thorough exploration of the specific context studied.

A limitation of this study is that it primarily reflects the perspectives of faculty developers, with limited input from instructors, highlighting the need for future research to include and address instructors' viewpoints.

### **Time**

A notable limitation in this research study was the time constraint imposed by the Royal Roads University master's program schedule, which spans a 10-month period. In addition to the tight timeline, I had to conduct interviews outside of the postsecondary system's winter break and during the busy semester starting in January, limiting the time available for data collection and analysis. This limited time may have affected the depth and comprehensiveness of the research. Consequently, it was important to narrow the scope of the study to allow for a focused and intensive examination of the data collected within the given time frame.

### **Positionality**

No researcher can achieve complete objectivity in their study processes; however, it is important for a researcher to align their own positionality (i.e., bias or stance) with their research question and objectives (Merriam & Tisdell, 2015). My background as a TVET instructor, my work as a participant in provincial education committees, and my current role in a public higher education institution's teaching and learning center as a curriculum teaching and learning specialist (i.e., a faculty developer promoting excellence in teaching and supporting the professional development of faculty members) may have influenced my interactions with some of the research participants.

Additionally, my bias includes a strong belief in the necessity of continuous professional development for instructors. As a master's student in learning and technology, I view digital literacy as an essential and ever-evolving skill. I believe instructors play a crucial role in preparing students to become digitally literate citizens capable of thriving in society, today and in the future. To achieve this, instructors need to include technology in their teaching. Furthermore, I hold the view that work–life balance is important for the well-being and effectiveness of educators. Recognizing these biases, I aimed to approach this research with an awareness of my positionality, striving to mitigate its impact on data collection and interpretation.

To ensure the study's objectivity, I used strategies to minimize conflicts of interest. These included developing and using an interview guide to ensure participants were treated equally and the data were comparable across interviews. I also engaged in continuous practice of self-reflection and monitoring, keeping a reflective research journal of reflexive notes to track decisions and thought processes throughout the research, thereby maintaining a high level of vigilance against bias. Additionally, I wove verification strategies into the research process as described in Chapter 3.

### **TAM Limits**

Overall, the TAM explains instructors' technology adoption, yet the model has limitations. The TAM lacks the ability to conceptualize what it means to accept and integrate technology in learning contexts. Specifically, the model does not identify the types of professional knowledge about teaching and learning with technology that teachers need to

meaningfully integrate technology (Scherer et al., 2019). Moreover, Islam et al. (2014) found that the TAM was deceptively straightforward, potentially oversimplifying the complex factors influencing technology adoption in educational settings. Additionally, although the TAM has substantial empirical support, and is widely cited in literature as the model used to study technology acceptance, it does not consider emotional motivational factors (Taherdoost, 2018). The use of digital technology is not only for completing tasks but also for fulfilling emotional needs (Taherdoost, 2018). To address this limitation, I incorporated current literature in this study to provide a more holistic understanding of technology adoption in the educational context.

In summary, the ubiquity of digital technology and the increasing demand for digital education in Canada's postsecondary sector underscore the growing importance of digital literacy in the role of educators (VanLeeuwen et al., 2020; Veletsianos et al., 2021). Additionally, there is a recognized need to support faculty development in a context-specific manner while prioritizing well-being. The need to enhance how digital technology is used in postsecondary education is particularly relevant in practical and experiential learning, such as TVET (Basilotta-Gómez-Pablos et al., 2022; Marín & Castañeda, 2023; UNESCO, 2022). The focus of this study is to explore how digital literacy might support B.C.'s TVET instructors in facing the challenges they encounter in their profession and promoting instructor digital resilience.

## **Chapter 2: Literature Review**

In this chapter I provide a literature review grounding the study in existing knowledge. The literature review begins with an overview of TVET's teaching context, influences, and curricular culture. Next, I broadly examine the research topic of digital literacy professional development and teacher resilience. More specifically, the literature review encompasses the following areas: (a) digital literacy frameworks for teacher competence, (b) factors contributing to effective professional development, (c) criteria for assessing the effectiveness of professional development, and (d) factors to help TVET teacher overcome barriers and integrate digital pedagogies.

First, it is important to recognize that faculty development needs are contextual, and approaches should be shaped by various factors such as beliefs, culture, and discipline (Marín & Castañeda, 2023; Salleh et al., 2021). Therefore, I begin the literature review by situating the study, providing an overview of the teaching context, influences, and curricular culture of TVET.

### **Technical and Vocational Education and Training (TVET)**

TVET emerged during the first Industrial Age (Industrial Revolution) to offer education that balanced both knowledge and technical skillsets, addressing the evolving needs of the workplace (Vinden, 2020). TVET has retained the tradition of supporting economy and education, preparing individuals for specific professions, trades, or crafts based on occupational and employment needs (Cattaneo et al., 2022; Vinden, 2020). TVET developed in contrast to academic education, resulting in differing educational aims and perceptions; academic education was intended for intellectual development (the mind), whereas vocational focuses on skills (the

body) (Rose, 2005). Moreover, TVET has traditionally adhered to a view that considers training as a final outcome, employing teaching approaches that primarily focus on the one-way transmission of knowledge from instructors to students and the imitation of skills by learners (Kanwar et al., 2019; Mutohhari et al., 2021; Nyembe, 2022). Elements of today's TVET system still retain the hand–mind binary and didactic beliefs aligned with the needs of the 20<sup>th</sup> century (Kanwar et al., 2019; Vinden, 2020). Collectively, these beliefs are not helping individuals prepare for the constantly evolving world of work and lifelong learning of the 21<sup>st</sup> century (Kanwar et al., 2019; Mutohhari et al., 2021).

Amid the 21st century's rapid shifts, particularly post COVID-19, TVET faces unique challenges in preparing learners for a workplace centered on complex problem-solving (Heena & Nidhi, 2022; Mutohhari et al., 2021; Romero-Hall & Cherrez, 2022). Technology is integrated into all occupations, transforming career profiles and emphasizing the need for problem-solving skills (Kanwar et al., 2019; Mutohhari et al., 2021). In this era, TVET competencies require critical thinking abilities, creativity, collaboration, and an increasing focus on high digital literacy (Heena & Nidhi, 2022; Mutohhari et al., 2021). One factor restraining the digitalization of TVET education is the widespread issue of insufficient digital literacy of TVET teachers (Cattaneo et al., 2022; Seufert & Scheffler, 2016; Vinden et al., 2021). In particular, TVET teachers have significant difficulties in applying communication and collaboration skills and choosing digital technology (Drage, 2010; Gretch & Camilleri, 2020; Heena & Nidhi, 2022; Mutohhari et al., 2021). Addressing these specific professional development needs and fostering the necessary digital skills among TVET teachers is essential to overcoming the constraint of

insufficient digital literacy in the digitalization of TVET education (Gretch & Camilleri, 2020; Meyer et al., 2023).

TVET teachers have unique professional development needs due to their teaching context and the path they take to become educators (McGowan, 2023; Nyembe, 2022; Vinden et al., 2021). In Canada, many TVET instructors enter the education field as a second career after mastering a skilled trade certification and gaining work experience in their respective fields (Vinden, 2020; Vinden et al., 2021). For the most part, tradespeople, or journeypersons, undergo training on the job as an apprentice, which accounts for approximately 80%–85% of the apprentice time. The remaining 15%–20% of the time is dedicated to training at a college or another provider, and the entire apprenticeship and training process takes place over 4 years (Kanwar et al., 2019; Vinden et al., 2021). Professional development for TVET teachers goes beyond the requirement of learning to teach while teaching. It includes the need for development in both the specific trade domain and work-based competencies to understand the labour market (Vinden, 2020).

However, there is a lack of structure regarding teacher qualifications (Nyembe, 2022), and many practitioners believe that their years of industry experience and trade mastery make teacher education unnecessary (Vinden, 2020). These attitudes significantly influence teaching practices, leading TVET teachers to perpetuate a transmissive approach to teaching (Girardet & Berger, 2018). Nevertheless, teacher education plays a crucial role in challenging and transforming these direct transmission beliefs, to overcome resistance to change and encourage the adoption of more active strategies and innovative pedagogy (Girardet & Berger, 2018;

Vinden et al., 2021). Additionally, the ongoing professional development of in-service teachers is important to avoid going back to prior beliefs and practices (Girardet & Berger, 2018).

Although individual faculty development is crucial, the broader educational system and institutions are pivotal in steering the shift toward modern digital education (Cattaneo et al., 2022; Nyembe, 2022). The organization of TVET institutions often operates in a manner that promotes teacher interchangeability, enabling them to teach any class within a department while adhering to a prepackaged program (Girardet & Berger, 2018). As a result, this limits teacher autonomy and restricts opportunities for adopting new outcomes, applying differing strategies and deviating from established norms (Girardet & Berger, 2018). In addition, the TVET curriculum in Canada is standardized based on the occupational analysis of existing trades, and training resources (books and manuals) are provided by provincial training authorities—both are no longer appropriate (Kanwar et al., 2019; Vinden, 2020; Vinden et al., 2021). The prevailing TVET model, encompassing curriculum development, relies heavily on traditional vocational practices aimed at teaching what is already known and practised in industry rather than focusing on imparting the knowledge and skills needed for the present and an uncertain future (Taylor & Freeman, 2011; Vinden, 2020; Vinden et al., 2021).

In addition, institutions lack frameworks to influence the competent use of digital media (Seufert & Scheffler, 2016). The TVET system needs to explore the most effective ways to support and prepare teachers with the necessary knowledge and skills for the current workforce and an uncertain future and jobs that do not yet exist (Taylor & Freeman, 2011; Vinden, 2020; Vinden et al., 2021). Kanwar et al. (2019) proposed that technology integration plays a

significant role in promoting transformation and innovation in education. To foster innovation, it is essential for teachers to have digital literacy and competencies that enable them to effectively integrate technologies with pedagogy (Basilotta-Gómez-Pablos et al., 2022; Gretch & Camilleri, 2020).

### **Overview of Digital Literacy**

Digital literacy is an evolving concept encompassing various integrated skills and practices (conceptual, attitudinal, procedural, and ethical), empowering individuals and groups to participate and communicate efficiently in society's communicative environment (Marín & Castañeda, 2023). Although digital literacy is a widely employed term worldwide, the European context favours the concept of digital competence, which is used similarly (Fernández-Batanero et al., 2022). Tarraga-Minguez et al. (2021) supported this interpretation and claimed that digital competence is a multifaceted educational concept that encompasses various aspects related to the use of technology in teaching and learning. In this paper, I investigate both digital competence and digital literacy as related concepts, recognizing that competence goes beyond literacy or understanding to the application of technology (Europaea, 2018). Worldwide, digital teaching literacy or competence has been a priority in the educational literature with the aim of training and evaluating teachers (Marín & Castañeda, 2023).

### **Competencies for Digitally Literate Educators**

Several models have emerged as common approaches for assessing, enhancing, and supporting educators' digital teaching competency through continuous professional development (Guggemos & Seufert, 2021; Marín & Castañeda, 2023; Tarraga-Minguez et al., 2021). These

models include: (a) information and communication technologies; (b) International Society for Technology in Education (ISTE) standards for educators' (c) digital competence framework for educators (DigCompEdu); and (d) synthesis of qualitative evidence model (Marín & Castañeda, 2023). The most common framework among them is DigCompEdu (Cattaneo et al., 2021).

Guggemos and Seufert (2021) advocated for the technological pedagogical content knowledge (TPACK) model over the generic DigCompEdu for in-service teachers' professional development; emphasizing the integration of technology into teaching, TPACK is action-based in nature and focused on teacher attitudes and informal learning. The digital learning strategy for B.C.'s postsecondary system presents priorities and recommendations (B.C. Digital Learning Advisory Committee, 2023) and proposes digitally literate educators' competencies as follows:

- assesses and selects digital technologies, considering ethics, accessibility, available technical support, affordability, and learner cognitive load;
- facilitates learners' access to assistance in utilizing campus-wide technologies;
- offers precise guidelines on the technology's usage, providing technical assistance, and furnishing learners with support resources when introducing new technology;
- actively searches for and selects technologies that promote Indigenous self-determination, incorporating Indigenous knowledge and cultural expressions; and
- collaborates with teaching and learning centres (or equivalent entities) to guarantee the accessibility and inclusivity of online course materials, assessments, and activities. This involves ensuring that materials uploaded online adhere to accessibility protocols, such as Web Content Accessibility Guidelines; verifying that links are functional and not broken;

and creating course sites that are user-friendly and easy to navigate, among other considerations.

### **Challenges and Professional Development**

The challenges of digitalizing TVET education depend on the digital capabilities of teachers (UNESCO, 2022), and there is interest in professional development that prepares faculty to teach in digital education contexts (B.C. Digital Learning Advisory Committee, 2023; Bates, 2019; VanLeeuwen et al., 2020). Pedagogical training must go beyond teaching technology skills to focus on helping faculty integrate technology and pedagogy and encourage critical reflection among educators (Brown et al., 2020; VanLeeuwen et al., 2020).

### **Professional Development**

In the broad context of higher education across several countries, Sims and Fletcher-Wood (2021) suggested that teacher professional development is most effective when it is sustained, collaborative, and subject-specific; draws on external expertise; is practice-based; and garners teacher buy-in. Within the TVET context, time and lack of employer support for teachers have emerged as the most significant obstacles to their professional development (Cattaneo et al., 2022; Drage, 2010; UNESCO, 2022; Vinden, 2020). Notably, TVET teachers showed a strong willingness to engage in professional development if provided with dedicated time within their schedule and opportunities for collaboration (Drage, 2010). Vinden (2020) and Cattaneo et al. (2022) explained that TVET teachers' workload differs from academic programs, with more teaching hours and less professional development support, making workload a critical factor influencing digital competence development. Moreover, a significant barrier to professional

development is the lack of motivation stemming from the perception that professional development does not cater to individual and subject-specific needs in TVET (Drage, 2010; Nyembe, 2022).

In a global study by UNESCO (2022), TVET teachers identified the lack of relevant digital content as a barrier to participation in professional development. Drage (2010) and Kanwar et al. (2019) suggested that TVET teachers were more likely to participate in digital literacy professional development that helps them to (a) expand the use of technology in instruction to provide flexibility; (b) develop critical thinking and problem-solving skills in students; (c) foster teamwork skills in the classroom and beyond; (d) integrate work-based learning; and (e) learn in group-based environment to facilitate peer-to-peer approaches. Additionally, financial incentives, recognition, validation, and standards may help to improve professional development (Drage, 2010; Kanwar et al., 2019). Additionally, flexible, remote, and informal learning opportunities are important (Kanwar et al., 2019). Currently, most teachers acquire their knowledge of using digital media for learning through informal learning processes; these informal learning experiences should be integrated into TVET professional development to foster a school culture of collaborative learning, where educators can learn together and from each other (Kanwar et al., 2019; Seufert & Scheffler, 2016). McGowan (2023) suggested that technical education teachers' professional development should be tailored to each teacher's needs and strategically organized for optimal outcomes. This is particularly important given the diverse range of skilled trades, technical competencies, and varied teaching and learning

environments in TVET, which require professional development to address specific requirements and overcome barriers to effective digital literacy integration (Nyembe, 2022).

Researchers have highlighted sociodemographic factors, such as age, gender, and teaching experience, as significant to the professional development of teachers' digital competency; this is particularly evident in their self-perception of digital competence (Grande-De-Prado et al., 2020; Rubach & Lazarides, 2021). In a Spanish higher education case study, Grande-De-Prado et al. (2020) discovered that men were more likely to perceive themselves as competent in using digital information and communication technology. Rubach and Lazarides (2021) delved into the gender differences debate regarding higher education teachers' digital competency beliefs. Their findings suggested that male teachers often view themselves as more adept at analyzing, reflecting, and creating digital content. By contrast, Drage (2010) theorized that specialized opportunities might improve male teachers' understanding and utilization of reflection for professional growth and instructional enhancement in the context of TVET. Although the topic of gender and digital competence has been extensively researched, consensus remains elusive (Grande-De-Prado et al., 2020). However, teachers' beliefs about teaching methods and their basic computer skills impact their technology adoption in education (Rubach & Lazarides, 2021). The role of gender, especially in TVET, where women constitute only about 5% of skilled workers in Canada (Frank & Frenette, 2019), warrants further exploration.

Another significant factor in tailoring digital literacy professional development is teachers' years of experience (Drage, 2010). Effective teacher education should encompass diverse learning experiences (Girardet & Berger, 2018). Additionally, age is instrumental when

devising collaborative learning experiences. For instance, Liu et al. (2022) assessed teacher competence in online teaching during the COVID-19 pandemic. Their findings suggested that younger instructors have greater online teaching capabilities than older instructors; however, they would benefit from bolstering their resilience. Meanwhile, professional development could provide older educators with more opportunities to sharpen their online teaching skills to capitalize on their resilience (Drage, 2010).

The COVID-19 crisis has further accentuated the importance of digital literacy in higher education. In response, the B.C. Ministry of Post-Secondary Education and Future Skills launched the B.C.'s Post-Secondary Digital Learning Strategy in 2021. This initiative underlines the urgent need for further research, especially concerning the impact of technology-enhanced learning on educators' well-being (B.C. Digital Learning Advisory Committee, 2023).

### **Instructor Digital Resilience**

Instructors' well-being is an essential requirement for providing high-quality education and training (Sappa et al., 2019). Understanding teachers' resilience, which refers to their ability to remain engaged and content in the teaching profession despite its demanding nature, provides valuable insights into identifying the challenges and resources influencing their well-being (Sappa et al., 2019). Liu et al. (2022) found that teacher competence influences teacher resilience, making it vital to strengthen the cultivation of teacher competence in digital teaching. Enhancing teachers' pedagogical knowledge and self-confidence is essential because believing in their abilities boosts resilience and well-being, especially during challenging times such as the COVID-19 pandemic (Liu et al., 2022).

To develop teacher resilience, Baldwin and Rosier (2017), emphasized the importance of teacher training curricula that prepare educators to be flexible and able to respond to unpredictable issues as they arise. Strengthening TVET teachers' self-efficacy beliefs (confidence in their ability to use technology) and influencing their perceptions of the usefulness and ease of use of technology can impact their intentions to integrate technology into their instructions (Salleh et al., 2021). Finally, professional development plays a vital role in developing teaching practices that support and foster resilient relationships among professionals, promoting collaboration in designing and developing digital learning experiences (Brown et al., 2020).

### **Preparing for the Future**

Overall, the TVET system, originally designed for the Industrial Age, faces challenges adapting to the 21st-century workplace (Vinden, 2020). Although historically focused on vocational skills, modern work demands a blend of technical expertise, digital literacy, critical thinking, and creativity (Kanwar et al., 2019; Vinden, 2020; Vinden et al., 2021). A significant hurdle is the prevalent digital literacy gap among TVET educators in Canada, many of whom transition from trades without formal pedagogical training (Kanwar et al., 2019; Taylor & International Journal of Applied Engineering and Management Letters (IJAEML) Freeman, 2011; Vinden et al., 2021). Institutional structures further exacerbate these issues by limiting educator autonomy and sticking to outdated, standardized curricula (Flinn, 2020; Girardet & Berger, 2018). To modernize, there is an urgent call for enhancing digital competencies among educators and reimagining institutional norms for the evolving nature of work (Basilotta-Gómez-Pablos et

al., 2022; Gretch & Camilleri, 2020). British Columbia's digital learning strategy outlines priorities for digitally competent educators; the challenges of digital education largely hinge on teachers' capabilities, underscoring the need for training that integrates technology and pedagogy while fostering educators' critical reflection (B.C. Digital Learning Advisory Committee, 2023; Brown et al., 2020). The COVID-19 pandemic underscored the importance of digital literacy, emphasizing the need to study its impact on educators' well-being (B.C. Digital Learning Advisory Committee, 2023; Brown et al., 2020; Passey, 2021). Building resilience and boosting confidence in digital teaching is paramount, with professional development playing a pivotal role in preparing faculty to teach in the digital education context (Brown et al., 2020; Liu & Chu, 2022; Rubach & Lazarides, 2021).

In conclusion, research on teacher professional development for digital education in Canada is sparse (VanLeeuwen et al., 2020). Furthermore, there is a noted lack of research on TVET pedagogy (Lucas, 2014). In this study I aim to inform future professional development by evaluating the digital literacy of TVET instructors in B.C., and appraising factors and strategies that foster effective professional development and teacher resilience. For this research I used the TAM as a theoretical framework to explore instructors' capacity for integrating digital tools into teaching. The literature review underscores the contextual nature of faculty development needs in TVET, emphasizing the challenges of adapting to the 21st-century workplace and the importance of digital literacy, professional development design considerations, sociodemographic factors affecting digital competency, and instructor resilience. The limited

research on teacher professional development for digital education in Canada highlights the need for further investigation.

### **Chapter 3: Methodology and methods**

In Chapter 3, I outline the research methodology and methods used in this qualitative study to address the research question: How can digital literacy professional development design enhance the digital resilience of TVET instructors in British Columbia? I detail and explain the methods used in this study and the tools for collecting data, including how I gathered and analyzed the data. Also covered are the reliability, validity, and trustworthiness of the data collection tools and activities, along with the ethical considerations involved.

#### **Methodology**

In qualitative research, research quality relies on selecting an appropriate methodology and carefully interpreting findings to ensure credibility, including validity and reliability (Gill et al., 2008; Johnson & Christensen, 2014a; Leung, 2015). I used a qualitative approach in this study to investigate the research questions about instructors' digital literacy professional development, aiming to understand educational issues and participants' perspectives (Johnson & Christensen, 2014a). A qualitative approach is appropriate for this study because it involves exploring lived experiences without relying on numerical data or calculations, focusing instead on understanding individual perspectives (Aspers & Corte, 2019). There is a wide range of qualitative research traditions, such as narrative research, phenomenology, grounded theory, ethnography, case study, and participatory action research (Merriam & Tisdell, 2015).

I applied an interpretive phenomenological approach to address my research questions because it creates opportunities to learn from the experiences of others and recognizes my role as a researcher (Neubauer et al., 2019). Phenomenology is a branch of philosophy and a research

approach focused on understanding people's lived experiences (Gill, 2020). Phenomenological researchers aim to communicate the essence of an experience or phenomenon in rich detail (Merriam & Tisdell, 2015). Various philosophers have developed different types of phenomenology, each rooted in distinct philosophical traditions (Neubauer et al., 2019). Edmund Husserl is credited with establishing descriptive phenomenology, which seeks to describe the essence of experiences (Gill, 2020; Neubauer et al., 2019). This approach, also known as transcendental phenomenology, emphasizes describing experiences without offering explanations and aims to set aside hypotheses and preconceptions (Gill, 2020; Neubauer et al., 2019). It involves the process of *epoché* or bracketing, where the researcher intentionally suspends their biases to better understand participants' perspectives (Husserl, 1970).

In contrast, interpretive phenomenology, or hermeneutic phenomenology, developed by Martin Heidegger, extends beyond description to interpret the meaning of experiences (Neubauer et al., 2019). It acknowledges that lived experiences are fundamentally connected to social, cultural, and political contexts (Neubauer et al., 2019). A key aspect of interpretive phenomenology is the role of the researcher, recognizing that the researcher cannot be entirely unbiased. The researcher plays an active role in uncovering and interpreting meaning (Neubauer et al., 2019). Interpretive phenomenology aligns with my research inquiry into perceived instructor needs, drawing on the experiences of professional development and the perceived ease of use (PEU) and perceived usefulness (PU) of digital technologies. It also acknowledges that my role is not neutral in the interpretation process, but I can address potential biases through reflexivity (Neubauer et al., 2019).

In phenomenological research, interviews are the primary method of data collection, allowing researchers to explore the elements, patterns, and relationships that shape the meaning of an experience (Merriam & Tisdell, 2015). For this study, I gathered data through interviews with participants who had lived experiences of engaging in professional development, as well as those with experience in designing and implementing professional development programs. The findings were then categorized and combined into general themes (Merriam & Tisdell, 2015).

### **Selecting a Sample**

Typical of qualitative research, I used purposeful sampling (non-random) because I selected the sample based on my judgment rather than random selection. Patton (2015) defined purposeful sampling as selecting information-rich cases that provide deep insights and understanding of key issues relevant to the study, rather than aiming for broad generalizations. I combined a purposeful criterion and convenience sampling to invite study participants from public institutions on the Skilled Trades B.C.'s approved list of TVET training providers, as well as individuals from Vancouver Community College's Provincial Instructor Diploma Program and BCcampus, who offer TVET instructor professional development. The primary reason for this decision is rooted in my phenomenological approach in this study, with which I seek to gain understanding from a chosen sample that offers the greatest learning potential due to their specific experience and expertise (Merriam & Tisdell, 2015).

### **Recruitment**

To begin the recruitment process, I started by identifying the Skilled Trades B.C.'s TVET training providers, which include school districts, non-public, and public providers. I choose to

invite participants from all the public providers within higher education institutions as follows: BCIT, Camosun College, Coast Mountain College, College of New Caledonia, College of the Rockies, Kwantlen Polytechnic, Nicola Valley Institute of Technology, North Island College, Northern Lights College, Okanagan College, Selkirk College, Thompson Rivers University, University of Fraser Valley, Vancouver Community College, and Vancouver Island University (SkilledTradesBC, 2023).

After identifying the TVET training institutions, I curated a list of faculty developers from the institutions' teaching and learning centres by conducting an internet search for publicly available contact information. In this study, "faculty developers" refers to individuals who support instructors with teaching skills and professional development. Typically, faculty developers design and facilitate workshops, provide individual consultations and coaching, assist with curriculum and instructional design, and help faculty integrate educational technology into their teaching. Following this, I conducted an online search to find email contacts for Vancouver Community College and BCcampus. I then had a contact list of faculty developers who support TVET instructors. Subsequently, I developed a contact list of TVET instructors using the same process of compiling contacts from the TVET training institution websites (all publicly available information). Using publicly available information was important to the recruitment process because it reduced the likelihood of bias in selecting participants and ensured compliance with ethical guidelines related to maintaining the privacy and data protection of participants.

Finally, I emailed invitations (refer to Appendix C: Letter of Invitation) to all the individuals on the curated contact list of faculty developers who support TVET instructors and

TVET instructors (totalling forty-three faculty developers and hundred and five instructors). Participants expressed their willingness to participate by email reply. I then scheduled mutually agreed interview times and emailed all participants a request for informed consent (see Appendix A). I selected the first five faculty developers who accepted the invitation from different institutes and the first two TVET instructors who accepted the invitation from different institutions and trades. Additionally, I invited two purposefully selected participants from entities supporting TVET professional development in B.C., Vancouver Community College and BCcampus, to participate in the study. Finally, I selected one faculty developer based on a referral (snowball sampling) because of their significant experience working with TVET instructors. In total, I interviewed ten participants (eight faculty developers and two instructors) from eight organizations.

Mocănașu (2020) analyzed the literature on adequate sample sizes for qualitative research across various contexts, including master's theses, and suggested that there is no consensus on sample size. In the context of interview-based qualitative research, Adler and Adler (2012) recommend that graduate students focus on a small sample size, typically six to twelve participants. This study's sample size of ten participants aligns with Adler and Adler's recommendations. Factors influencing my decision included the time available for data gathering, the feasibility of the study, and institutional boundaries. Specifically, the timeframe for conducting interviews required that participants be available in January and February 2024. As a master's student, I had to gather data, analyze it, and write papers in under a year. I considered feasibility, as I am a new researcher learning the process. As Adler and Adler (2012)

recommended, student researchers should choose a setting where they already know the people and are familiar with the context, accordingly I selected a research context in which I had prior familiarity. Lastly, I designed the recruitment process to include individual instructors (micro), faculty developers who work within institutions (meso), and participants from provincial professional development entities (macro) to provide a broad perspective on digital literacy professional development initiatives and instructor digital resilience.

### **Study Participants**

I interviewed a total of ten participants, including eight faculty developers and two instructors, from eight different organizations. The study participants were a diverse group of faculty developers from post-secondary teaching and learning centers (TLCs), responsible for professional development in areas such as teaching, course and program support, curriculum development, technology integration, and leadership mentorship within institutions. Participants included an educational developer, a dean of learning and teaching, an associate vice president of teaching and learning, an instructional associate and an educational developer. Vancouver Community College (VCC) and BCcampus also provide support services to enhance teaching, learning, and educational technology across post-secondary institutions in the province. The three participants from VCC and BCcampus were leaders in organizing and promoting professional development opportunities for trades instructors, helping them stay current with teaching methods, industry trends, and technologies. The group of faculty developers included four women and four men. Finally, two skilled trades instructors, one welding instructor and one hairdressing instructor, participated in the study—one man and one woman.

## **Interviews**

Gill et al. (2008) categorized three types of research interviews: structured (fixed questions, quick but not in-depth), unstructured (open-ended, time-consuming, ideal for initial investigations), and semi-structured (predefined questions with scope for further exploration). I gathered data for this study through semi-structured interviews, using an interview guide (refer to Appendix B: Interview Guide) to investigate the research questions because semi-structured interviews are a powerful tool for gathering in-depth meaningful data from interviewees (Ruslin et al., 2022), with a structure that provided flexibility for participants to share relevant information (Gill et al., 2008). I informally tested the interview guide questions with a colleague, a TVET instructor, to identify potential misunderstandings, and make necessary adjustments to improve clarity before interviewing the research participants.

I conducted the interviews between January 11 and February 8, 2024, via the video conference platform Zoom, using my Royal Roads University student account, so there were no geographic constraints in interviewing participants. With the participants' permission, I recorded the Zoom interview sessions, and the transcripts were automatically generated with Zoom's transcription tool. Royal Roads students' account cloud recordings and transcripts are stored in Canada to comply with Royal Roads University data privacy requirements and ensure the integrity of the research data.

The interviews, which lasted up to an hour, were guided by 10 open-ended questions to ensure comprehensive discussions of each topic. This duration allowed me to ask follow-up clarifying questions and accommodate unexpected yet relevant discussions. After each interview,

I downloaded the transcripts onto an encrypted drive for secure storage. Immediately after each interview, I documented my initial thoughts and feelings, along with key insights from the interview, in my research journal. My research journal had two parts: (1) dated handwritten notes using my password-protected reMarkable (a paper-like digital tablet), and (2) a large whiteboard on my home office wall as a visual device where I made shortened versions of my notes, which were memos to myself about what I was learning.

Subsequently, I reviewed the transcripts to improve their accuracy by listening to the interview recordings to correct any inconsistencies and misinterpreted language. I cleaned the data to clarify acronyms and remove repeated words, filler words, and jargon. I also verified and corrected the formatting, paragraphs, sentences, punctuation, and spelling. Additionally, I anonymized the data to ensure that research participants could not be identified in the text. The data files were then ready for analysis.

### **Data Management and Analysis**

Next, I reread all the transcripts to familiarize myself with the data and manually journaled a list of keywords that encapsulated my initial thoughts and observations. These initial steps laid the groundwork for using NVivo Release 1.5.1 (940) software (QSR International, Melbourne-Australia), a qualitative data analysis software application. I uploaded the cleaned and anonymized interview transcripts into NVivo for thematic analysis.

### **Reflexive Thematic Analysis**

I analyzed the data using Braun and Clarke's (2019, 2020) reflexive thematic analysis method, rooted in their 2006 thematic analysis process. Braun et al. described thematic analysis

as an independent qualitative descriptive approach as a technique for recognizing, examining, and documenting patterns within data (2006). This method prepares researchers with core skills essential for various qualitative analysis forms (Byrne, 2022). I used reflexive thematic analysis in this study for several important reasons. It provided a flexible, systematic, and reflective approach to analyzing qualitative data, resulting in trustworthy data interpretations.

Braun and Clarke (2006) initially outlined a six-phase process for thematic analysis: (1) familiarization with the data by reviewing it thoroughly and noting key details; (2) generating codes as concise labels that encapsulate the data's essence; (3) theme generation by clustering coded data into themes or subthemes, ensuring they are pertinent to the research question; (4) reviewing potential themes by critically assessing them in relation to the data and research queries; (5) defining and naming themes, ensuring they contribute meaningfully to the findings' narrative; and (6) finalizing the report by arranging themes logically to create a seamless narrative. Since 2006, Braun and Clarke's methodology has evolved into what is now called reflexive thematic analysis (Byrne, 2022). This updated method emphasizes the researcher's active role in creating knowledge and codes to reflect the researcher's interpretation of patterns in the data (Braun & Clarke, 2019). Reflexive thematic analysis combines the dataset, theoretical assumptions, and the researcher's analytical skills. The process of coding and developing themes is flexible and evolves during analysis (Braun & Clarke, 2019). A key aspect of reflexive thematic analysis is that the researcher's role and input are essential, inevitable, and integral to the process (Devine, 2021).

### **Organizing the Data**

In keeping with the reflexive thematic analysis process, I organized the data by going through the interview scripts line-by-line and assigning codes to segments of the text that appeared significant or interesting using NVivo, a qualitative data analysis software. I used a word or short phrase as a code to capture the essence, ideas, and meaning of a piece of text data (Jones, 2024). Codes were descriptive (what was happening), interpretive (what it meant), or pattern-based (commonalities across the data). Thematic analysis is an iterative process, so I undertook the coding process several times. I began by coding the interview transcripts into numerous individual codes. These codes were then grouped based on similarity in an Excel spreadsheet, allowing for refinement and the identification of broader themes and subthemes. I then summarized the codes in tables (see appendix, Tables 1–4) with representative quotes. I selected representative quotes from the interview transcripts to illustrate and support the identified themes, providing actual examples and ensuring the themes were grounded in the data. I present the findings in Chapter 4.

### **Validity**

I chose the semi-structured interview format because it can bolster validity, allowing participants to express their views in their own words, offering context that captures an authentic representation of their perspectives (Gill et al., 2008; McGrath et al., 2019). Although the flexibility of semi-structured interviews introduced variability in responses, I mitigated this challenge by adhering to a clear set of interview guidelines (Gill et al., 2008; McGrath et al., 2019). I prioritized participants' perspectives by using their exact words to reduce the risk of

altering or misrepresenting the study's conclusions (Muzari et al., 2022). I achieved this through detailed data collection and transcription processes, including verbatim transcription, and I confirmed the transcripts (as described in the earlier data collection section) to enhance validity.

A well-known method for strengthening the internal validity (or credibility) of a study is triangulation, which generally involves four types: the use of multiple methods, multiple investigators, multiple theories, and multiple sources of data (Merriam & Tisdell, 2015). In this study, the thesis supervisory team reviewed the themes and subthemes. I used multiple data sources to strengthen internal validity; I collected data by interviewing people with different perspectives, namely instructors and faculty developers from a range of institutions and organizations. Validity ensures research alignment with sound methods; it can be enhanced by corroborating results from different data sources and methods, thereby strengthening interpretations and conclusions (Johnson & Christensen, 2014a; Leung, 2015).

### **Reliability**

In qualitative research, reliability refers to the degree to which research findings can be replicated and produce similar results (Leung, 2015; Merriam & Tisdell, 2015). Replication by other researchers, even with some variations such as using different participants, should yield comparable evidence, thereby strengthening the reliability and robustness of the findings (Johnson & Christensen, 2014b). For reliability, I clearly document each step of the research process in a way that allows other researchers to explain how I arrived at the study results. To do this, I kept a detailed written research journal to write my reflections, questions, and decisions while collecting and analysing data.

**Trustworthiness**

For meaningful and useful research results, the researcher must demonstrate that the data analysis has been conducted in a consistent, systematic, and thorough way by disclosing the methods of analysis in detail. This enables the reader to evaluate if the research is credible (Lorelli et al., 2017). To demonstrate my research process and build trustworthiness, I described my procedure of engaging in reflexive practice with journaling; provided a detailed description of the research context; followed the reflexive thematic data analysis process; and explained how themes were identified, including the coding process, in the earlier section (Chapter 3: Methodology).

**Ethical Considerations**

The research adhered to Royal Roads University's Research Ethics Policy Number 1003, which includes compliance with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans, the Tri-Agency Framework: Responsible Conduct of Research, and relevant Freedom of Information and Protection of Privacy Legislation. Participant confidentiality was consistently maintained, with all personal and identifiable information anonymized to ensure privacy. I obtained informed consent from every participant prior to their involvement, ensuring they were aware of the research purpose, procedures, potential risks, and their right to withdraw at any point without any repercussions. Moreover, I stored data securely to prevent unauthorized access.

In summary, the research method for this study involved semi-structured interviews and purposeful sampling to ensure a diverse range of perspectives. Semi-structured interviews

provide a balance between predefined questions and the flexibility for participants to express their views. Through the sampling strategy I targeted instructors and individuals from teaching and learning centres (faculty developers) to gather micro- and meso-level insights from public TVET training providers in British Columbia. Additionally, interviews included representatives from provincial-level entities, with the aim to capture a macro view of professional development initiatives. I performed data analysis through reflexive thematic analysis, supported by NVivo software, following the method outlined by Braun and Clarke (2006, 2019).

### **Chapter 4: Findings and interpretation**

The main research question guiding this study is: How can digital literacy professional development be designed to enhance the digital resilience of TVET instructors in British Columbia? I considered three sub-questions in identifying themes: (1) What are the needs and competencies of TVET instructors? (2) What are the digital education requirements of TVET institutions? (3) What are the key features of digital literacy that will prepare TVET instructors to succeed while also supporting digital resilience? In the following chapter I report the research findings and consider why the findings are important. I will interpret the research findings within the broader context of existing research and through the lens of the TAM to understand how instructors come to accept and use technology.

#### **Findings**

I identified four major themes through the data analysis:

- (1) The breadth of instructor needs and competencies, with subthemes including digital tools and pedagogy,
- (2) TVET-specific professional development, which includes subthemes, time, and instructor identity,
- (3) Critical digital literacy, and
- (4) Meaningful connections for resilience, with boundaries and flexibility as subthemes.

Tables 1–4 in Appendix D summarize each theme, along with its component subthemes, codes, and representative quotes. In the following section, I describe the themes in detail.

## **The Breadth of Instructor Needs and Competencies**

### **Digital Tools**

First, the anticipated theme, the *breadth of instructor needs and competencies*, captured participants' responses to the question "What are the needs and competencies of TVET instructors?" According to the participants, the top educational technologies used for teaching and learning (subtheme: *digital tools*) include institutional learning management systems (LMSs), video, PowerPoint, Word, Excel, Zoom, artificial intelligence (AI), and response systems (i.e., online polling and quizzing). Faculty Developer 6 said that instructors must be "able to navigate the learning management system and use the learning management system for grading," and Faculty Developer 7 stated that instructors "need good video skills." Further, fundamental digital skills are needed, including proficiency in document applications (such as MS Office Email, Word, Excel, and PowerPoint), file management, and organizational skills in digital environments. Additionally, skills in connecting to appropriate online resources, using search engines, sharing documents, and collaborating on online documents (e.g., SharePoint and Teams) are essential. As highlighted by Faculty Developer 2, "but as our curriculum, materials, and everything, move more and more onto platforms . . . communication and the ability to use the tools is absolutely necessary."

The findings regarding the needs and competencies of TVET instructors align with the trends identified in Canadian postsecondary education by Johnson (2023). According to Johnson

(2023), the leading technologies used for teaching and learning are institutional LMSs, video conferencing tools like Zoom, online polling and quizzing platforms, recorded lectures, and online video demonstrations. Additionally, Vinden et al. (2021) surveyed TVET instructors in British Columbia and found that 24.3% of participants perceived their lack of digital skills as a barrier to teaching in digital education contexts. Overall, the participants recognized that TVET instructors need a wide range of digital literacies and competencies. However, the data reveal competency gaps in fundamental digital skills, including proficiency in document applications like the MS Office suite, file management, and organizational skills in digital environments. Some instructors need to improve basic computer skills; others require proficiency in program-specific digital tools to remain up to date in their fields. As an example, Faculty Developer 8 explained:

I think one of the things is that the use of technology is across the board. It's a mile wide and an inch deep. I still run across trades instructors who do not know how to attach an attachment to a file. I have people who teach, who still cannot figure out how to put a hyperlink in a form posting.

Participants frequently mentioned that certain digital competencies, literacies, and access issues are assumed to be possessed by TVET instructors, which may not be accurate, as evident from Faculty Developer 4's statement: "I've worked with amazing people who can't find the backspace on their computer, and their children do their email for them." Drawing on the TAM, instructors with foundational digital skills are more likely to perceive new technologies as easier to use and build upon their competencies. Supporting this interpretation, Ursavaş (2022)

suggested that individuals with greater experience are more likely to have positive perceptions of both the ease of use and the usefulness of new technologies. This finding is significant because it underscores the importance of TVET instructor digital literacy professional development programs addressing multiple competency levels, including basic and trade-specific digital technology tools. However, digital literacy extends beyond technical skills, encompassing a deeper understanding of how to select and integrate technology appropriately (Knight et al., 2023).

### **Digital Pedagogy**

Moving beyond technical skills, digital literacy encompasses a deeper understanding of how to appropriately select and integrate technology with the intention of enhancing teaching and learning (Knight et al., 2023; Martin et al., 2022). The subtheme *Digital pedagogy* represents a range of pedagogical competencies that TVET instructors need, such as assessment design, collaborative practices, creating student engagement, designing seamless user experiences, and constructing teaching and learning resources. Faculty Developer 3 provided insight into the complex skills that TVET instructors need to teach effectively by integrating content, technology, and disciplinary expertise with evidence-based pedagogy.

I think TPACK, the technology pedagogical content knowledge framework, is crucial.

It's really important to recognize that instructors who are teaching these programs have expertise in content and disciplinary expertise. . . . You have to marry your disciplinary expertise with technology to become an effective technology-based teacher. (Faculty Developer 3)

Faculty Developer 7 further illustrated this theme by pointing out that although instructors may know how to use a digital tool, such as PowerPoint, they may lack the skills needed to integrate it meaningfully.

A lot of instructors are being told to teach the theory online and do the practice face-to-face. . . . But they struggle to find engaging ways to deliver that information in an online setting. They know it's not effective to dump slides on people and talk for an hour, but they don't really know how else to do it. (Faculty Developer 7)

The research findings contribute to the ongoing discourse on the topic that TVET instructors need to expand their role beyond content expertise and technical skills. Kanwar et al. (2019) highlighted the critical need for TVET instructors not only to acquire technical and digital skills but also to undergo a fundamental shift from traditional teaching methods to digital pedagogies. The shift requires transitioning from the role of traditional instructors to facilitators, a complex process of educational change (Kanwar, 2019; Martin et al., 2022). In digital education, especially in online environments, facilitation skills are critical to student success (Martin et al., 2020). Additionally, Vinden et al. (2021) claimed that in 21st-century learning, instructors are no longer merely expected to deliver lectures from a stage; instead, they are encouraged to engage directly with their students and facilitate a more interactive educational experience. The challenges teachers face with their technological professional development arise from shortcomings in educational approaches, where the focus remains on transmissive rather than transformative teaching methods (Montero-Mesa et al., 2023). Consistent with previous studies, the data in this study support the idea that TVET instructors require proficiency in digital

pedagogy to facilitate learning across various modalities and engage learners successfully.

Additionally, instructor professional development initiatives should make educational theory and frameworks transparent to guide instructors in the appropriate selection and integration of digital technology, particularly TPACK.

Making educational frameworks visible and clear is important in supporting instructors' transition to digital pedagogy by enhancing the PU and PEU of technology. From the TAM viewpoint, providing structured guidance and support through these frameworks not only facilitates technology adoption but also aligns it effectively with pedagogical goals, thereby improving educational outcomes (Stuttgart University of Applied Science, n.d.). However, Johnson (2023) suggested that upskilling in digital literacy and preparing to teach in digital education environments should not be the sole responsibility of individual instructors; institutions need to share the responsibility. Considering institutional roles, I characterize the requirements of TVET institutions in terms of digital education in the following theme.

### **TVET-Specific Professional Development**

I derive this second theme, TVET-specific professional development, with subthemes of *Time* and *Instructor Identity*, from the analysis of participants' responses to questions regarding TVET institutions' digital education requirements. TVET programs are structured to meet the requirements of SkilledTradesBC, formerly known as the ITA. In particular, SkilledTradesBC standardizes TVET programs. Funded by the provincial government, this public sector organization regulates skilled trades training, certification, and the apprenticeship system. SkilledTradesBC sets standards for various programs, including classroom hours, on-the-job

training duration, program content, assessment strategies, and certification exams. These factors pose challenges and constraints to advancing digital literacy in TVET institutions across British Columbia.

### **Time**

Institutions face challenges in scheduling professional development within restrictive TVET schedules, limiting opportunities for instructors' professional development. When asked about the most significant barriers to integrating digital technologies into TVET, a Faculty Developer 1 responded: "You know their schedules are very restrictive compared to instructors in other parts of the college. . . . It has been a challenge to meet trades instructors where they're at because of the way their programs are structured." The issue of limited time was a recurring response, as echoed by Faculty Developer 4: "They don't have time to get anything new shoehorned into their courses, which has to follow the line reading, you know of what they're doing for SkilledTradesBC," and Faculty Developer 2 said, "I think one of the biggest barriers is time, faculty time in learning and adopting technology because of the contact hours. . . . TVET instructors are teaching 25 hours per week." Previous researchers concur with this finding; authors of other global studies have claimed that time, including the lack of employer support for teachers, has emerged as the most significant obstacle to professional development within the TVET context (Cattaneo et al., 2022; Drage, 2010; UNESCO, 2022; Vinden, 2020). This is important for the design of professional development because it highlights the need for flexible and accessible options. To effectively support TVET instructors, professional development

programs must be structured in a way that accommodates their demanding schedules and instructors need support from their institutions.

In contrast, although many participants described time as a barrier to TVET professional development, one individual's perspective stood out: "I hear a lot that there's not the time to attend and come for help, but I'm always wondering if there's something underneath that, or is it something else?" (Faculty Developer 3). From the TAM perspective, the lack of time to learn new technology can be understood in terms of PEU and PU. First, if individuals perceive that learning to use new technology will be time-consuming or difficult, they may be less likely to accept new digital practices. Second, even if an individual recognizes the benefits of adopting digital pedagogies, they may weigh the importance of their time against the expected benefits or the PU.

Determinants of PU in adopting digital technologies are also influenced by the subjective norm, which is a belief that the majority of influential individuals support the system, and job relevance is the belief that digital technology is applicable to their job (Venkatesh & Davis, 2000). This implies that TVET program requirements not only determine structure, content, and assessment but also influence instructors and institutions in determining what they perceive to be of value. Participants referred to the value of digital literacy, which is neither integrated into program outlines nor recognized by institutions and external bodies. As illustrated by Faculty Developer 4, digital literacy

should be a whole new unit. It should be ongoing like a systemic part of the framework. I just feel that when you've got those external bodies coming, they don't know how to assess it. They don't know how to bring it in.

Consequently, digital literacy remains largely a hidden curriculum.

Recognizing the need for updating, *SkilledTradesBC's 2023–2026 Strategic Plan* aims to modernize B.C.'s apprenticeship and trades system, aligning it with technological advancements and evolving labour market needs (SkilledTradesBC, 2023). For institutions, this means working in collaboration with external bodies such as SkilledTradesBC, program articulation committees, and community partners to explicitly include digital literacy outcomes in TVET program outlines and professional development initiatives. Additionally, professional development design must account for both external and internal instructional structures and recognize the unique needs of TVET instructors.

Another organizational barrier that affects instructors' digital literacy and resilience is organizational policy. For illustration, Faculty Developer 8 suggested how institutional policies can influence the perception of control.

Sometimes, IT policies are hostile to good pedagogy. Oh, just try putting Padlet on a school system without having to pay for it? And they'll say, well, we don't have a licence for that. Well, I want to use it. Or I want to use an online debating software. Nope, we can't do that because there's no way. We do not want to install that.

This is a significant point because the extent to which users feel they have control over the successful use of a technology is influenced by their belief in the organization's technical

support, available resources, and supportive organizational policies; this is a construct of the TAM as described by Venkatesh and Bala (2008). In light of these findings, professional development cannot be designed in isolation; it can only be designed with the perception of external control in mind.

### **Instructor Identity**

Other significant barriers to enhancing digital pedagogy in TVET programs include instructors' perceptions of expertise (or identity), the lack of required professional development incentives for instructors, and limited access due to the lack of digital infrastructure.

TVET institutions frequently hire instructors who often transition from other skilled trade work experience without prior teaching experience or formal teacher education, making it even more difficult to advance digital teaching and learning (Vinden et al., 2021). Faculty Developer 4 articulated that the perception of trade or vocational expertise influences instructors' PU of professional development.

It's the perception of who has expertise in what; professors and instructors in all their disciplinary areas have spent years becoming competent and developing that deep level of disciplinary expertise, but we know that doesn't always mean that they know how to teach it. (Faculty Developer 4)

Once hired, some TVET institutions require instructors to complete the Provincial Instructor Diploma, but incentives are often lacking, as pointed out by Faculty Developer 3: "It's also the fact there's not a lot in the way of reward or incentive to income." Faculty Developer 5 explained

that both the perception of expertise, along with the lack of incentives and institutional hiring practices, all work together as barriers to professional development.

The problem with a lot of trades faculty is they get caught up in this mindset, that: 1) this is just a job and 2) I'm an expert. I don't need to learn or grow anymore and they're paying me a good wage to teach something that I could teach in my sleep. If you want me to do that, it's going to cost you.

With this study I contribute to the literature by providing further evidence that TVET teachers have unique professional development needs due to their teaching context and the path they take to become educators (Mcgowan, 2023; Nyembe, 2022; Vinden et al., 2021). In Canada, many TVET instructors enter the education field as a second career (Vinden, 2020; Vinden et al., 2021), and the lack of structure regarding teacher qualifications contributes to the belief that their years of industry experience and trade mastery make teacher education unnecessary (Nyembe, 2002; Vinden, 2020). Noonan (2019) suggested that professional development can be designed to be flexible and adaptive, acknowledging that instructor identities develop throughout their career. Training providers offer most existing professional development programs as single, unconnected events, lacking clear alignment in training objectives and program activities (Zhou et al., 2023). Consequently, it is essential to develop a comprehensive training system that offers systematic support for the ongoing development of vocational teachers. This is especially important now, as new concepts, methods, and technologies continually emerge (Zhou et al., 2023). The findings of this study, in conjunction with the literature, suggest that professional development should be designed to be continuous.

Moreover, from a TAM perspective, professional development can be incentivized to influence determinants of PU, including subjective norms and job relevance (Venkatesh & Bala, 2008). When users see direct rewards and advantages, incentives can emphasize the practical benefits and added value of technology. For the design of digital literacy professional development, this means that rewards and recognition can increase motivation.

Finally, institution facilities and community digital infrastructure are limiting the advancement of digital literacy, particularly outside of B.C.'s lower mainland and Southern Vancouver Island. Several participants in the study voiced concerns about these challenges. For example, Faculty Developer 2 shared that a "barrier is the facilities on campus." Likewise, Instructor 1 said, "You really need a computer, and you need a good internet connection, which is also pretty questionable, especially when you live outside of the main city. There's lots of places here where having a video conference is almost impossible."

The findings confirm disparities in high-speed internet and mobile cellular access across Canada, with only 42.9% of households on First Nations reserves and 59.5% in rural/remote areas having access to minimum connection speeds (Office of the Auditor General of Canada, 2023). Williams (2021) underscored the urgent need for affordable high-speed broadband internet in First Nation communities in British Columbia. This lack of connectivity means that many First Nations and remote communities cannot access online education and work. However, equal access through infrastructure alone is not sufficient to ensure meaningful participation in TVET education because individuals may face digital literacy changes. As a result, institutions and external bodies need to acknowledge the lack of high-speed connectivity to promote and

support digital connectivity. Furthermore, digital literacy professional development should be shaped to support instructors in diverse settings, recognizing the unique challenges faced by those in remote and First Nations communities. In addition to improved digital infrastructure, critical digital literacy also plays a role in enabling people to engage with and leverage digital technologies.

### **Critical Digital Literacy**

The third predetermined theme evolved from questions concerning the key features of digital literacy that will prepare TVET instructors to succeed while also supporting digital resilience. Critical digital literacy enables instructors and students to navigate digital tools and environments effectively. It allows them to critically assess and integrate technology into their teaching and learning while understanding the societal implications and power dynamics in digital spaces (Darvin, 2017).

Regarding core digital literacy, one participant's response stood out to me. Faculty Developer 3 emphasized the importance of critical digital literacy, articulating, "I feel like everything is core . . . because it's such a fluid and dynamic entity. What you think is core now isn't core later. The baseline competency would be a critical understanding . . . which tools work best and why." Similarly, Faculty Developer 7 described the intricate challenges involved in integrating digital technology with pedagogy: "For teachers in general, the constantly changing issues around privacy and copyright and creative commons and what information am I allowed to collect? . . . Professional development programs could really provide that emphasis."

Similarly, Johnson (2023) analysed trends in Canadian postsecondary education and identified upholding academic integrity as one of the foremost challenges in teaching and learning. This study supports Johnson's findings, emphasizing the need for professional development programs that enhance academic integrity. Relatedly, researchers have explored the dimension of perceived ethics within an extended TAM theoretical framework. For example, Ferrell et al. (2023) and Ly and Ly (2022) examined how ethical considerations influence intentions to use digital technology from the perspective of TAM. They argued that ethics is a key construct in the adoption of technology. This suggests that critical digital literacy, which equips instructors to maintain academic integrity, is needed for the adoption of digital pedagogy. Moreover, a favourable attitude toward digital tools positively impacts the likelihood of their use. Therefore, professional development must emphasize both academic integrity and the ethical selection of digital tools.

In addition, I identified attitude (i.e., flexibility and openness) as a core feature of digital literacy that supports digital resilience, as evidenced by the participant's comments such as: "One is to allow yourself to be human and make mistakes. Try it, at least try it. Take a risk and try something new" (Faculty Developer 8)"; and "being open to change, open to new things, and also looking after yourself" (Instructor 2). Additionally, Faculty Developer 4 said that resilience would be a "willingness to learn and not be completely upset and destroyed by technology." Johnson (2019) examined professional development for online teaching in Canada before the 2020 COVID-19 pandemic and identified faculty effort and the acceptance of online learning as significant barriers. In the context of the TAM, attitude is a crucial construct for technology

adoption; individuals with a more favourable attitude toward technology are more likely to use it (Farrell et al., 2023). Considering attitude within the TAM framework, attitude determines PEU because it characterizes various qualities and emotions, such as computer self-efficacy, computer playfulness, and computer anxiety (Venkatesh & Bala, 2008). These characteristics influence the intention, adoption, and sustained use of technology (Venkatesh & Bala, 2008). As suggested by Venkatesh and Bala (2008), professional development designed with useability and enjoyment in mind can positively influence PEU. Additionally, professional development interventions that are hands-on (user participation) and are supported by management and peers can all positively influence digital literacy initiatives (Venkatesh & Bala, 2008). In summary, I identified attitude in the findings as a core digital literacy skill and an important aspect of resilience. Building on these insights, supporting resilience overlaps with the next theme: the importance of connecting to support resilience.

### **Meaningful Connections for Resilience**

I built the fourth and final theme, *meaningful connections for resilience*, from questions regarding how digital literacy profession development can be designed to enhance the digital resilience of TVET instructors. The theme represents participants' views on the importance of connection and collaboration, meaning in one's teaching practice, and supporting instructors in setting boundaries and practising flexibility.

First, the findings suggest that collaboration is essential for professional development that supports resilience. Supporting this theme, Faculty Developer 4 explained, "Being able to collaborate online with others has been very helpful for professional well-being and resilience. .

.. Digital literacy is about collaboration,” and Faculty Developer 5 said, “A collaborative effort between people in the department, I think, would really help.”

From the TAM perspective, collaboration influences the PU of digital technology by mediating the subjective norm. Individuals perceive the technology as useful because it is used by peers and other important individuals to them (Venkatesh & Bala, 2008). Additionally, collaboration as a key feature of professional development is supported in the literature. Professional development plays a vital role in developing teaching practices that support and foster resilient relationships among professionals, promoting collaboration in designing and developing digital learning experiences (Brown et al., 2020). Further, Esterhazy et al. (2021) reviewed 48 peer-reviewed qualitative studies from several countries on professional development to evaluate ways in which faculty might improve their teaching quality to support students’ learning. The authors found that the literature emphasized that faculty collaboration, functioning as a community, is widely reported to have a positive effect on teaching and learning. This means that professional development can build on a framework of collegial faculty development, for example mentorships, communities of practice, and informal digital networks.

Further, the data suggest that connection to the meaning of teaching is another element of resilience. Several participants illustrated insights about resilience and meaning, notably: “It all starts with our heart, the value system that we have” (Faculty Developer 5) and “To maintain your curiosity and maintain love for what you’re doing. Keep hold of the sense of meaning that teaching brings . . . the resilience comes from the sense of connection and meaning in what we do” (Faculty Developer 7). The findings support studies in various contexts showing that digital

literacy has a positive effect on emotions and meaning, such as perceived enjoyment and ease of technology use (Liu et al., 2022; Nazari-Shirkouhi et al., 2023). A foundation in digital literacy enables instructors to focus on meaningful aspects of their teaching practice. Moreover, to enhance digital resilience, professional development should extend beyond technology skills to also support faculty in blending technology with teaching methods while encouraging critical reflection (Brown et al., 2020; VanLeeuwen et al., 2020).

### **Boundaries**

Establishing boundaries enhances emotional health by protecting teachers from becoming overburdened with their responsibilities. By setting clear distinctions between work hours and personal time, instructors can maintain a healthier balance between their professional and personal lives (Healey, 2023). The data suggest that connecting to self or self-care, particularly in setting boundaries, is significant to professional development and enhances instructors' resilience. As described by Faculty Developer 8, evolving digital technologies make boundaries more porous:

Technology is constantly changing. You have to maintain some sort of boundaries for how it's going to be used . . . maintaining well-being. I'm just thinking about cell phones. That technology has really changed instructor access. And I think that students have an expectation of 24-7 access now.

The B.C. Digital Learning Strategy proposed human-centred approaches to enhancing digital literacy. The well-being of educators and staff is prioritized and supported across all modalities and settings in postsecondary education. This commitment addresses factors such as workload,

professional development opportunities, safety in digital environments, health and well-being supports, and trauma-informed policies (B.C. Digital Learning Advisory Committee, 2023). Maintaining trustworthiness and transparency by making expectations clear and maintaining boundaries are foundations of trauma-informed teaching and learning principles (Carello & Thompson, 2022). Therefore, it can be inferred that digital literacy professional development should take a trauma-informed approach, teach trauma-informed practices, and provide resilience training. However, a systemic approach is required to truly embed these practices across the TVET professional development because resilience applies not only to individuals, but also to social systems and organizations (Kärner et al., 2021). This was illuminated by Faculty Developer 3:

I think instructor resilience means there are problems with the organization or with the structures. . . . It's a little bit like the canary in the coal mine. It tells us a little bit about the culture and the context in which that instructor is working . . . maintaining well-being, developing, continuing with your professional growth, and staying positive, optimistic, and hopeful have assumed privileges with it. So, I think it's important to recognize that. Finally, intersecting with earlier findings on *attitude* as a feature of critical digital literacy, a common participant perspective on resilience is the importance of instructors' *flexibility* (i.e., openness and adaptability). Faculty developer 1 said, "I think one of the key things that shows resilience is the ability to not get locked into a particular way of doing things, because that's just how it's done." Likewise, Faculty Developer 6 voiced "They don't just say no to a new . . . they have an openness to learn from someone who might have more knowledge in a particular field."

To reiterate, professional development programs can emphasize flexibility and openness, encouraging instructors to adapt and embrace new teaching methods and technologies. By making training hands-on and highlighting practical benefits, instructors will find new technologies easier to use and more valuable. Additionally, promoting peer learning and collaboration can help share knowledge and enhance the PU of these technologies.

To sum up, in Chapter 4 I presented the findings of my investigation into digital literacy professional development that can enhance the digital resilience of TVET instructors in British Columbia. I identified four major themes: the breadth of instructor needs and competencies, TVET-specific professional development, critical digital literacy, and meaningful connections for resilience. Key findings include the necessity for instructors to master both basic and trade-specific digital tools and the importance of digital pedagogy. Professional development should be continuous, flexible, and supported by institutional policies, addressing both technical skills and the ethical use of digital tools. Collaboration, connection to the meaning of teaching and setting boundaries are essential for fostering resilience. The study highlights the need for systemic support in professional development to ensure TVET instructors can adapt to evolving digital landscapes and maintain their well-being.

## **Chapter 5: Discussion**

I identified four major themes through this research that have implications for professional development design to enhance the resilience of TVET instructors: (1) the breadth of instructor needs and competencies, (2) TVET-specific professional development, (3) critical digital literacy, and (4) meaningful connections for resilience. Following is a brief discussion of the research sub-questions and the significance of the research findings, leading to recommendations for the main research question: How can digital literacy professional development be designed to enhance the digital resilience of TVET instructors?

### **What Are the Digital Literacy Needs and Competencies of TVET Instructors?**

The data suggest that TVET instructors' needs and competencies are complex, particularly regarding digital literacy. Professional development programs can address a range of competency levels, from basic digital skills to trade-specific digital technology tools. This is significant because it enables instructors to incorporate digital technologies effectively into their teaching practices. Consistent with the literature, the research data highlight that TVET instructors need proficiency in digital pedagogy to successfully facilitate learning across various modalities and engage students. Professional development initiatives should make educational theories and frameworks, such as TPACK, transparent. This guidance is essential for the appropriate selection and integration of digital technologies, ensuring that instructors can effectively enhance their teaching strategies and improve student outcomes.

### **What Are the Digital Education Requirements of TVET Institutions?**

TVET institutions must meet SkilledTradesBC's guidelines and standards. Given the demanding and structured schedules of TVET programs, professional development for instructors must offer flexible and accessible options to fit these schedules. Collaboration with external bodies such as SkilledTradesBC, program articulation committees, and community partners is essential to effectively incorporate digital literacy into program outlines and professional development initiatives. Institutions can encourage and incentivize continuous professional development, highlighting the practical benefits and added value of technology to boost motivation. Additionally, digital literacy professional development can consider both external and internal instructional structures and address the unique needs of TVET instructors. The design of these initiatives can also account for the perception of external control, influenced by organizational and technical support, resources, and policies, as emphasized by the TAM.

### **What Are the Key Features of Digital Literacy That Will Prepare TVET Instructors to Succeed While Also Supporting Digital Resilience?**

Key features of digital literacy that will prepare TVET instructors to succeed and support digital resilience include an emphasis on academic integrity and ethical tool selection. Professional development can be designed to enhance usability and enjoyment, making technology easier to use and more engaging. Hands-on, participatory interventions supported by management and peers are crucial. Additionally, acknowledging connectivity issues and tailoring programs for diverse settings, including remote and First Nations communities, is important. Faculty collaboration through mentorships, communities of practice, and informal digital networks positively impacts teaching and learning. Digital literacy foundations can focus on

meaningful teaching practices, blending technology with pedagogy, and encouraging critical reflection. Programs can also incorporate trauma-informed practices and resilience training, recognizing that resilience is a characteristic of both individuals and social systems. Emphasizing flexibility, openness, peer learning, and collaboration can help instructors adapt to and embrace new technologies and teaching methods.

### **How Can Digital Literacy Professional Development Be Designed to Enhance the Resilience of TVET Instructors in B.C.?**

Based on my research, my recommendations focus on enhancing digital literacy and resilience among educators in TVET through the following initiatives.

#### **Recommendations**

**Recommendation 1: Design professional development opportunities to address multiple competency levels,** including fundamental digital skills. This is important because TVET instructors have varying levels of digital proficiency. To achieve this, create progressive training programs that cover basic to advanced digital skills such as document applications, file management, organizational skills, search engine use, document sharing, and online collaboration. By drawing on the TAM, ensure the training increases PEU and PU, making the adoption of digital tools smoother and more effective for instructors.

**Recommendation 2: Create professional development initiatives that make educational theories and frameworks transparent.** This is important because clear guidance helps instructors select and integrate digital technologies effectively. To do this, professional development programs should include detailed explanations and examples of TPACK in action.

Integrate hands-on workshops and collaborative sessions where instructors can apply the framework to real-world teaching scenarios, thereby reinforcing their understanding and ability to use digital tools in their classrooms. This approach will leverage the principles of the TAM to increase PEU and PU, facilitating smoother technology adoption.

**Recommendation 3: Develop facilitation practices to shift traditional teaching methods to digital pedagogy.** TVET instructors need proficiency in digital pedagogy to effectively facilitate learning across various modalities and engage students. Digital pedagogy is an emerging concept that involves using digital technologies to enhance teaching and learning (Maor, 2017). It is rooted in the theories of constructivism (Dewey, 1929; Piaget, 1980; Vygotsky, 1962) and connectivism (Siemens, 2005). Constructivism suggests that learners build knowledge through engaging learning in active and reflective experiences, with teachers acting as facilitators who guide active student engagement (Bada & Olusegun 2015). Connectivism highlights the importance of digital networks in supporting the sharing and personalization of learning experiences and encourages educators to adopt strategies that foster networked learning environments and lifelong learning (Alam, 2023). Consequently, faculty development should model active and collaborative or networked learning such as group discussions, reflection, role-playing, building relationships by treating participants as peers and co-learners, sharing values, understanding goals and beliefs, peer support activities, and integrating interactive multimedia, simulations, games and social media into faculty learning (Aithal & Aithal, 2023; Perry & Booth, 2024).

**Recommendation 4: Plan flexible and accessible professional development programs**

to accommodate TVET instructors' demanding schedules and ensure they receive the support they need from their institutions. To realize this, offer training sessions at various times using a range of delivery modalities, making sure that the content is directly relevant and immediately applicable to their teaching context. Additionally, institutions and external bodies need to acknowledge the lack of high-speed connectivity and promote and support digital connectivity. To do this, institutions can work in collaboration with external bodies such as SkilledTradesBC, program articulation committees, BCcampus, and community or industry partners. This approach can include developing digital literacy outcomes in TVET program outlines and professional development initiatives, accounting for both external and internal instructional structures, and recognizing the unique needs of TVET instructors.

**Recommendation 5: Design continuous and sustained professional development**

Ongoing training is important to support sustained growth and adaptability in digital literacy. Institutions should offer incentives to influence perceived usefulness, subjective norms, and job relevance. For example, institutions can create welcoming campus spaces for professional learning, set clear expectations for faculty engagement in professional development, clearly communicate how this engagement aligns with position or job descriptions and evaluation systems, and provide rewards and recognition. Without clear messaging, faculty may receive mixed signals about whether they should allocate their already limited time to professional development (Flaherty, 2003). By applying the Technology Acceptance Model (TAM), institutions can help make faculty feel supported through technical assistance, available

resources, and supportive organizational policies. Examples of such policies include dedicated funding, time allocation, financial incentives, standards, validation, and recognition for development activities; access to resources and training; and support for work-life balance may help to improve professional development.

**Recommendation 6: Emphasize academic integrity and ethical selection of digital tools** in professional development. This is important to ensure that instructors make responsible and informed choices when integrating technology into their teaching. To do this, design professional development programs with useability and enjoyment in mind, as suggested by Venkatesh and Bala (2008), to positively influence PEU. Include hands-on interventions that encourage user participation and are supported by management and peers. This approach will enhance digital literacy initiatives by making technology adoption more engaging and effective.

Professional development programs can facilitate conversations about the ethical considerations when selecting digital technologies including access, equity and inclusion, data ethics (i.e. data privacy, consent, bias and the ethical use of information), academic integrity and truth, copyright, environmental impacts, power, and implications of technologies on culture societies and employment. There are several models that can be helpful as reflective tools to consider technology's role in teaching and learning, and to emphasize the ethical selection of digital tools. For instance, SECTIONS, TPACK, SAMR and developing AI literacy models. The SECTIONS model for selecting digital technology in education consists of Student needs, Ease of use, Cost, Technical support, Integration, Outcomes, Novelty, and Scale, providing a comprehensive framework to evaluate and choose effective educational technologies (Bates,

2019). TPACK (Technological Pedagogical Content Knowledge) is a framework that emphasizes the intersection of technology, pedagogy, and content knowledge, and SAMR (Substitution, Augmentation, Modification, Redefinition) is a model that categorizes the levels of technology integration in education, ranging from simple substitution of traditional tools to redefining tasks in ways that were previously unimaginable (University of Calgary, n.d.). The AI literacy framework suggests four levels: (1) Understand AI, (2) Use & Apply AI, (3) Analyze & Evaluate, and (4) Create AI (Ng et al., 2021).

**Recommendation 7: Promote collaboration and resilience in professional development** by building faculty collaboration through mentorships, communities of practice, and informal digital networks. Implement this by extending professional development beyond technology skills to blend technology with teaching methods, encourage critical reflection, and incorporate trauma-informed practices and resilience training. Emphasize flexibility, openness, peer learning, and collaboration to help instructors adapt to and embrace new technologies and teaching methods. Also, institutions need to acknowledge that resilience is not only a characteristic of individuals but also of social systems and organizations (Kärner et al., 2021) and need to consider a comprehensive approach that supports digital literacy and resilience, enabling instructors to focus on meaningful aspects of their teaching practice.

In conclusion, in this chapter I proposed recommendations for designing professional development to enhance the resilience of TVET instructors, informed by the research findings summarized as four themes: (1) the breadth of instructors' needs and competencies, (2) TVET-specific professional development, (3) critical digital literacy, and (4) meaningful connections

for resilience. These findings recognize the importance of continuous, flexible, and accessible professional development programs that integrate educational frameworks, promote active learning, and support digital literacy. By incorporating incentives, fostering collaboration, and recognizing the unique challenges faced by instructors in diverse settings, institutions can create a supportive environment that enhances both digital resilience and prepares TVET instructors to succeed.

## **Chapter 6: Research Implications**

### **Summary of Findings**

In this qualitative study I investigated how digital literacy professional development can enhance the digital resilience of TVET instructors in British Columbia. I collected data through semi-structured interviews with faculty developers and instructors and identified four themes through the data analysis: (1) the breadth of instructor needs and competencies, (2) TVET-specific professional development, (3) critical digital literacy, and (4) meaningful connections for resilience. The TAM provided the context for understanding instructors' motivation to enhance digital pedagogy. Based on the findings, I made seven recommendations:

- (1) Design professional development opportunities to address multiple competency levels.
- (2) Create professional development initiatives that make educational theories and frameworks transparent.
- (3) Develop facilitation practices to shift traditional teaching methods to digital pedagogy.
- (4) Plan flexible and accessible professional development programs.
- (5) Design continuous professional development.
- (6) Emphasize academic integrity and ethical selection of digital tools.
- (7) Promote collaboration and resilience in professional development.

### **Implications**

There is a rising demand for postsecondary digital education due to numerous changes, including COVID-19, demographic shifts, and technological advancements (Basilotta-Gómez-Pablos et al., 2022; VanLeeuwen et al., 2020). Given the shift in the workplace and the

expectations for digital literacy for graduates when they enter the workplace, faculty are an essential factor in the growth and development of digital education and play a significant role in advancing it. Brown et al. (2020) highlighted the urgent requirement for faculty professional development in Canada concerning the use of digital technology in education. However, without enhancing faculty skills and knowledge in this regard, the demand cannot be met (Veletsianos et al., 2021). Similarly, Johnson (2019) investigated professional development for online teaching in Canada prior to the 2020 COVID-19 pandemic and found the top barriers to online learning were related to faculty effort, inadequate faculty training, and the acceptance of online learning by faculty. However, there are insufficient data to guide decisions regarding professional development for TVET instructors (B.C. Digital Learning Advisory Committee, 2023; Basilotta-Gómez-Pablos et al., 2022; Bates et al., 2017); in particular, research on digital competence and pedagogy in TVET is scarce (Cattaneo et al., 2022; Vinden, 2020; Vogt, 2014). The results of this study are significant within the existing body of knowledge because they address a gap in the research by providing data on the needs and competencies of TVET instructors, as well as the digital education requirements of TVET institutions.

Additionally, numerous changes and demands in postsecondary digital education in recent years require educators to be digitally resilient. B.C.'s Post-Secondary Digital Learning initiative emphasizes the importance of educators' digital literacy and well-being across all postsecondary settings, considering factors such as workload, digital space safety, and professional development opportunities (B.C. Digital Learning Advisory Committee, 2023). Digital literacy involves understanding and using digital tools wisely and responsibly, whereas

digital resilience encourages behavioural and attitudinal changes to better navigate stress in digital environments (Sun et al., 2022). Teacher resilience is impacted by their proficiency in online teaching, indicating that better digital competence could enhance their resilience when confronting difficulties (Liu et al., 2022). Educators must be resilient and adaptable to sustain their well-being while adapting to changes in evolving digital technologies (Romero-Hall & Cherrez, 2022; Weller et al., 2013).

Furthermore, this research offers practical recommendations for individual instructors (micro-level), institutions (meso-level), and external bodies such as Skilled Trades BC (macro-level) for designing TVET instructor professional development programs that enhance their digital resilience. The potential impact of this study includes improving the digital skills and resilience of TVET instructors, leading to more effective and engaging digital education in TVET institutions. By addressing the specific needs and competencies of instructors, and providing situated recommendations for different levels, this study can help institutions develop comprehensive professional development programs. This, in turn, can enhance the quality of education, better prepare students for the digital workforce, and support the overall advancement of digital education within the TVET sector. Additionally, by influencing external bodies like Skilled Trades BC, the study's findings can contribute to broader policy changes and funding allocations that support ongoing digital literacy and resilience training. On a societal scale, equipping teachers with these skills ensures that they can effectively impart digital literacy to their students, which is crucial for individuals to fully engage and participate in society (B.C. Digital Learning Advisory Committee, 2023; Marín & Castañeda, 2023).

### **Future Research**

In light of this study, several directions for future research can further enhance the understanding and implementation of effective digital literacy professional development for TVET instructors. First, the role of gender, especially in TVET, where women make up only about 5% of skilled workers in Canada (Frank & Frenette, 2019), needs further qualitative investigation. Researchers have suggested that men are more likely to see themselves as competent in using digital technology (Grande-De-Prado et al, 2020) and male teachers often feel more adept at analysing, reflecting, and creating digital content (Rubach & Lazarides, 2021). This is significant because teachers' beliefs about teaching methods and basic computer skills significantly impact their technology adoption in education (Rubach & Lazarides, 2021). Given the low percentage of women in skilled trades in Canada, understanding the barriers and opportunities for women in TVET is critical. Second, Sun et al. (2022) highlighted the absence of specific tools for measuring digital resilience and noted its unique aspects within educational settings, while Ang et al. (2022) demonstrated that digital training, incorporating components such as cognitive flexibility and problem-solving, significantly enhances resilience and reduces symptoms of anxiety, depression, and stress, emphasizing the need for more specialized tools to assess digital resilience. Future quantitative researchers should focus on defining digital resilience more clearly and developing reliable tools and metrics to assess it effectively. Third, much of this research represents the views of faculty developers, and future research is needed to address the gap in instructors' perspectives. Finally, future qualitative and quantitative researchers should investigate how the TAM can be expanded to include individual and

organizational wellness as factors impacting PU. Understanding these factors can provide a more comprehensive view of how digital tools are adopted and used in educational settings.

### **Conclusion**

Instructors play an essential role in meeting the growing demand for postsecondary digital education, driven by COVID-19, demographic shifts, and technological advancements. Faculty development in digital technology is crucial, yet there are inadequate data to inform professional development, leading to training and acceptance issues. This study fills a research gap by providing insights into the needs and competencies of TVET instructors and institutions. The B.C. Post-Secondary Digital Learning initiative stresses the importance of educators' digital literacy and well-being. Improved digital competence can enhance instructors' digital resilience, which is crucial for adapting to evolving technologies. This study offers practical recommendations for individual instructors, institutions, and bodies (such as Skilled Trades BC) to design professional development programs that enhance digital resilience. The implication of the research recommended includes enhanced digital skills and resilience among TVET instructors, leading to more effective digital education, better preparation of students for the digital workforce, and support for advancing digital education in the TVET sector. Influencing external bodies can drive policy changes and funding for ongoing digital literacy training. Ultimately, equipping instructors with digital literacy skills enables them to impart critical digital literacy to students, facilitating societal participation and preparing them for the future.

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## **Appendix A: Request for Informed Consent**

### **Digital Literacy Professional Development and Instructor Resilience**

This consent form describes the research study to help you decide whether to participate.

#### **Study Investigator**

Jessica Gemella, Master's Student, Master of Arts in Learning and Technology, Royal Roads University (RRU), Victoria, British Columbia, Canada

#### **Invitation**

I invite you to contribute to a research study. Before you decide whether you wish to participate, you need to understand why the research is being done and what it will involve. Please read the following information carefully.

#### **Who Is Invited to Participate in This Study?**

Faculty developers and instructors involved in technical and vocation education and training (TVET) higher education in British Columbia are invited to participate in this study.

#### **What Does Participation Involve?**

If you agree to participate in this study, I will ask you to participate in a semi-structured interview. Participants will be asked to share their experiences and perspectives on the role of digital literacy in teaching, its integration into the TVET curriculum, barriers to technology use, the effectiveness of professional development programs, and the impact of digital literacy on instructor professional well-being or resilience.

Your interview will take place via video conference (an RRU student-licensed version of Zoom) at a time that is convenient to you and mutually agreed upon with the researcher. The interview is expected to take up to 1 hour to complete.

#### **Research Purpose**

In the research I aim to explore how instructor digital literacy might prepare educators for the challenges they face in their profession and support instructors' professional well-being or resilience, specifically within the context of TVET in British Columbia.

Your participation will be highly valued and contribute to the understanding of digital literacy, professional development, and instructor resilience. Furthermore, your input may inform future decisions regarding professional development for TVET instructors.

#### **Confidentiality**

All feedback will be confidential to the extent permitted by law. Please note that your valuable ideas and opinions will appear in the report itself. However, any connection to your personal

identity, such as your name, will be strictly confidential. Data will be anonymized using a unique identifier composed of a combination of a letter and a number (e.g., A1, B2, C3). This combination will not correlate with any personal information and will be used consistently throughout the research. Results will be aggregated, and no comments will be directly attributed to you.

### **Voluntary Participation**

Your participation in this study is entirely voluntary. You are under no obligation to participate, and you can decline to participate without explanation or consequence.

### **Withdrawal**

If at any time you wish to withdraw from the study, you may do so by informing the researcher in writing at [REDACTED] or verbally, without any penalty or prejudice.

You may stop participating during the interview at any time by verbally informing the interviewer. Unless you give permission for the data to be used in the research, any data provided will be promptly deleted if you choose to terminate your participation.

Please note that although you can withdraw from the study at any point, there may be a limitation if your interview data have already been anonymized and aggregated for analysis. Once the data have been incorporated into the research findings in a way that can no longer be attributed to or withdrawn by an individual participant, retracting your data may no longer be possible. However, up until the point of anonymization and aggregation, you retain full rights to have your data removed from the study.

### **Legal Rights**

Your consent to participate in this study does not waive any legal rights.

### **Risk**

There is no anticipated risk associated with your participation in this study.

### **Confidentiality of Data**

All data collected will be kept strictly confidential and will only be accessible to the researcher for the purposes of this study. All data records will be password-protected or encrypted on servers or computers in Canada or stored in a locked cabinet for data security purposes. I will use a licensed version of Zoom (RRU student Zoom licence) so that all recorded information is stored in Canada.

### **Recording**

With your permission, your interview will be recorded to facilitate accurate transcription. This recording will be permanently deleted after transcription.

### **Data Retention**

Raw data from this research project will be retained for 5 years to complete the proposed research, including fulfilling RRU's master's program completion requirements and supporting future dissemination activities.

### **Compensation**

There will be no financial compensation for participating in this study.

### **Communication**

The results of this study will be communicated via academic journals, conference presentations, online media, and news articles. Should you choose, you may request a summary of the study or receive a notice of any free publication in which this study may appear.

### **Conflicts of Interest**

I recognize that my background as a TVET instructor, my current role as a curriculum teaching and learning specialist, my participation in provincial education committees, and the possibility of knowing some of the research participants could influence both the process of research and the interpretation of data. In the design of this study, I employ strategies to minimize conflicts of interest, including a prepared interview guide so that participants are treated equally, and the data are comparable across interviews. I, the researcher, will engage in constant self-reflection and monitoring to remain vigilant against bias by keeping a reflective journal to track decisions and thought processes throughout the research.

### **Questions and Verification**

If you have questions about the research, please contact Jessica Gemella,  
[REDACTED]

This study is being conducted under the guidance of Dr. Jo Axe, program head for the Master of Arts in Interdisciplinary Studies program at Royal Roads University, Victoria, British Columbia, Canada. For verification, you may contact the academic advisor, Dr. Jo Axe,  
[REDACTED]

[The research is approved by the Research Ethics Board of Royal Road - add this statement once approved]. If you have questions, concerns, or complaints about your rights as a research subject or research-related injury, please contact the Royal Roads Research Ethics Office at [REDACTED]  
[REDACTED]

### **Consent to Participate**

To give your free and informed consent to participate in this study, please reply to this email at [REDACTED] Ensure that your consent is clearly indicated in your reply.

## **Appendix B: Interview Guide**

### **Research Study: Digital Literacy Professional Development and Instructor Resilience**

Jessica Gemella, who is conducting this study, is a student in the Master of Arts in Learning and Technology, Royal Roads University, Victoria, British Columbia, Canada.

This study is being conducted under the guidance of Dr. Jo Axe, program head for the Master of Arts in Interdisciplinary Studies program, Royal Roads University, Victoria, British Columbia, Canada.

### **Greetings and Explanations**

- Greetings and introductions
- To avoid perceptions of conflict of interest, I will inform participants of my current role and background prior to the start of each interview. This disclosure will include relevant professional experiences and any affiliations that could be perceived as potential conflicts of interest. This communication allows participants to make informed decisions about their involvement in the study.
- Explain the purpose of the research.
- In the research I aim to explore how instructor digital literacy might prepare educators for the challenges they face in their profession and support instructors' professional well-being or resilience, specifically within the context of technical vocational education and training (TVET) in British Columbia.
- Your participation will be highly valued and contribute to the understanding of digital literacy, professional development, and instructor resilience. Furthermore, your input may inform future decisions regarding professional development for TVET instructors.
- The interview will take up to 1 hour to complete (via Zoom).

### **Review Confidentiality and Privacy**

Please note the following important points:

- All feedback will be confidential to the extent permitted by law.
- Participation is voluntary, and you can decline participation without explanation or consequence. You are under no obligation to participate in this research project.
- If you wish to withdraw at any point, you may inform the researcher in writing (email to [REDACTED] or verbally at any point. You have the option to withdraw without penalty or prejudice. You may terminate your participation during the interview at any time by verbally informing the interviewer. Unless you give permission for the data to be used in the research, any data provided up to that point will be deleted.
- By consenting to participate in this research, participants do not waive any legal rights. There is no substantial potential risk associated with your participation in this study. However, I acknowledge that discussing experiences with digital literacy could potentially cause mild stress or anxiety for some individuals. Please be aware that in the

interview I aim to explore the integral role of digital literacy in TVET. The questions will cover topics such as digital literacy core competencies, its incorporation into curriculum design, the challenges and enablers of its integration, its impact on instructor resilience, and the future needs for professional development. You have the freedom to skip any questions you prefer not to answer and can pause, stop, or withdraw from the interview at any time.

- All data collected will be kept strictly confidential and will only be accessible to the researcher for the purposes of this study. All data records will be password-protected or encrypted on servers or computers in Canada or stored in a locked cabinet for data security purposes.
- Raw data from this research project will be retained for 5 years to complete the proposed research, including fulfilling RRU's master's program completion requirements, and to support future dissemination activities.
- You will not be paid for being in this research study.
- Your interview may be recorded to aid transcription. The audio recording will be permanently deleted once the interview is transcribed.

### **Guiding Questions**

#### **Warm-Up Question**

(for faculty developers) Please share an experience where you felt a particular strategy or resource you provided significantly helped an instructor improve their approach to teaching with digital technology.

(for instructors) Please share an experience where you felt a particular strategy or resource helped you improve your approach to teaching with digital technology.

#### **Requirements and Competencies**

Digital literacy can be defined as a person's knowledge, skills, and abilities to use digital tools ethically, effectively, and within a variety of contexts to access, interpret, and evaluate information, as well as to create and construct new knowledge, and communicate with others (Digital Learning Advisory Committee, 2021).

What are the core digital literacy competencies required by TVET instructors?

How is digital literacy incorporated into TVET curriculum design and delivery? What impact does this have on teaching effectiveness in the TVET sector?

#### **Needs**

As a faculty developer or instructor, what are the most significant barriers to integrating digital technologies into TVET? What enables you to successfully integrate digital technologies into TVET?

How do current professional development programs address the digital literacy gaps among TVET instructors? Describe the impacts and effectiveness of these programs.

### **Key Features of Digital Literacy**

What aspects of digital literacy do you find most critical for the success of TVET instructors and students?

### **Professional Development Design**

Are there any digital literacy or pedagogy areas that need more emphasis (such as funding, development of resources, and organizational culture) in future TVET professional development programs?

### **Resilience and Digital Literacy**

Generally, instructor resilience refers to adapting, maintaining well-being, and continuing professional growth amidst challenges and change. What does instructor resilience mean to you?

How do you perceive the relationship between digital literacy and instructor resilience in the TVET context? Can you share an example where enhanced digital literacy has influenced instructors' professional well-being or resilience?

### **Closing Questions**

Reflecting on our discussion today, what steps do you feel TVET instructors could take to enhance their digital literacy and resilience?

Is there anything you would like to ask or anything I should have asked you?

### **Appendix C: Letter of Invitation**

Greetings, you are invited by Jessica Gemella, a master's student in the Master of Arts in Learning and Technology, at Royal Roads University, Victoria, British Columbia, to participate in a research study titled Digital Literacy Professional Development and Instructor Resilience.

#### **Study Purpose**

In the research I aim to explore how instructor digital literacy might prepare educators for the challenges they face in their profession and support instructors' professional well-being or resilience, specifically within the context of technical vocational education and training (TVET) in British Columbia.

Your participation will be highly valued and contribute to understanding digital literacy, professional development, and instructor resilience. Furthermore, your input may inform future decisions regarding professional development for TVET instructors.

#### **Study Procedures**

You are invited to participate in this study because you are a faculty developer or instructor involved in TVET higher education in British Columbia.

If you agree to participate in this study, I will ask you to participate in a semi-structured interview. I will ask participants to share their experiences and perspectives on the role of digital literacy in teaching, its integration into the TVET curriculum, barriers to technology use, the effectiveness of professional development programs, and the impact of digital literacy on instructor professional well-being or resilience.

Your interview will take place via video conference (Zoom) at a time that is convenient to you and mutually agreed upon with the researcher. The interview is expected to take up to 1 hour to complete.

Participation in this study is entirely voluntary. You have the right not to answer any question and to withdraw from the project at any time.

#### **Confidentiality**

All information gathered from participating in this study will be coded, and all personal identifiers will be removed, safeguarding your confidentiality. All data collected will be kept strictly confidential and will only be accessible to the researcher for the purposes of this study. All data records will be password-protected or encrypted on servers or computers in Canada or stored in a locked cabinet for data security purposes. I will use a licensed version of Zoom (RRU student Zoom licence) so that all recorded information is stored in Canada.

#### **Remuneration/Compensation**

There will be no financial compensation for participating in this study.

#### **Contact for Information**

If you have questions about the research, please contact Jessica Gemella

[REDACTED] You may also contact my supervisor, Dr. Jo Axe  
[REDACTED] program head for the Master of Arts in Interdisciplinary Studies  
program at Royal Roads University, Victoria, British Columbia, Canada.

**Contact for Concerns**

If you have questions, concerns, or complaints about your rights as a research subject or  
research-related injury, please contact the Royal Roads Research Ethics Office at [REDACTED]  
[REDACTED]

If you are interested in participating in this research study, please respond by email to  
[REDACTED]. In your response, please state that you would like to participate  
in the interview.

For more information, please review the detailed information outlined in the **Research Consent  
Form**.

Thank you for considering participating in this research.

Warm regards, Jessica Gemella

**Appendix D: Summary Tables – Themes, Subthemes, and Codes****Table 1***Theme: Breadth of Instructors' Needs and Competencies*

Subtheme	Codes	Representative Quotes	Freq.
Digital Pedagogy	Pedagogical Frameworks	“I think the success of TVET instructors and students is a TVET instructor who understands TPACK [Technological Pedagogical Content Knowledge].” (Faculty Developer 3)	18
	Pedagogy	“Gathering and assessing information and using it effectively in their pedagogy would be a core digital literacy competency that I would expect TVET instructors to have.” (Faculty Developer 5)	17
	Online and Hybrid	“One way to address the gaps is to recognize that online hybrid teaching is a mainstay now of universities.” (Faculty Developer 3)	4
	Organization	“It needs to be very well structured, very organized and appealing to look at, and that draws a student to want to go and look at what’s happening there.” (Instructor 2)	7
Digital Tools	Learning Management System	“Uploading and downloading, being able to navigate the learning management system, being able to use the learning management system for grading.” (Faculty Developer 6)	15
	Video	“They need good video skills.” (Faculty Developer 7)	1
	AI	“How are AI tools being used in applied settings in the workplace?” (Faculty Developer 1)	9
	PowerPoint	“I think it is important for instructors to know how to create, edit, and revise PowerPoints. From the standard PowerPoint, just a regular slide all the way to integrations of gifs and videos.” (Faculty Developer 5)	7
	MS Word and Excel	“I think the ability, at the very minimum, is the ability to use the broad applications all around us, like Microsoft Word, Excel and PowerPoint for teaching.” (Faculty Developer 2)	6
	Zoom	“People are delivering a lot of lessons on synchronous platforms like Zoom, and for most people when they are new, that’s a big learning curve.” (Faculty Developer 7)	5

	Response Systems	“Student response systems, so whether that be Socrative or Kahoot, I’ve seen a lot of instructors who have really been able to get a deeper level of engagement and feedback because of it.” (Faculty Developer 8)	2
	Social Media	“If we also think about social media, you need to promote yourself. We have to be able to instruct students how to post.” (Instructor 2)	2
	Trade Specific	“Every trade would have their specialty. Some trades are going to need to know drafting software, so AutoCAD.” (Instructor 1)	3

Note: The table summarizes the codes and subthemes within the theme. “Freq.” indicates frequency, that is, how many times I assigned the code to the data. “AI” refers to artificial intelligence.

**Table 2***Theme: Tailored TVET Professional Development*

	Codes	Representative Quotes	Freq.
Time	Time and Structure	“But digital literacy is not one of our core learning outcomes. Typically, because we’re EI-funded in the trades, we have rigid learning outcomes dictated by Skilled Trades B.C. We tend not to deviate too much from that because there’s not enough time. There’s already too much material. That said, digital literacy is not an explicit curriculum.” (Instructor 1)	49
Instructor Identity	TVET Specific	“But we find that when trades instructors have something specifically focused on them, they will answer and ask questions. But when they’re all in the same room, together with the biologists and the criminologists, I tend to get the whole thing, like when is this over? And then they [instructors] come up [to me], I don’t want to ask questions in front of those people. I don’t know if you get that [at your institution], but that’s what we do to be completely transparent.” (Faculty Developer 4)	16
	Second Career	“So perhaps putting it up front, recognizing that teaching is a change in profession. I would even go so far as to say show me some evidence that you’ve started your PID [Provincial Instructor Diploma Program] before you even come to apply to teach.” (Faculty Developer 5)	5
Access	Access and Digital Infrastructure	“There are still lots of places in BC, where people don’t have access to the Internet or very, very poor band quality and they can’t even get on Zoom.” (Faculty Developer 8)	3

Note: The table summarizes the codes and subthemes within the theme. “Freq.” indicates

frequency, that is, how many times I assigned the code to the data. EI is employment insurance

for individuals who lose their jobs.

**Table 3***Theme: Critical Digital Literacy*

Subtheme	Codes	Representative Quotes	Freq.
	Academic Integrity	“The ethical use of tools” (Faculty Developer 8)	15
	Privacy and Digital Citizenship	“The simple thing of teaching digital literacy is what name do you have on your resume—what email address? How professional does it have to be? And how are you on your social media? How to be professional?” (Faculty Developer 2)	12
	Equity, Diversity, and Inclusion (EDI)	“Why would I get rid of these videos? It’s all the same content. They [instructors] are still doing the same kind of dovetailed joints that we were doing back in the seventies. . . . Wouldn’t it be nice to have some other representation?” (Faculty Developer 4)	13
	Digital Access	“There are still lots of places in B.C. where people don’t have access to the Internet or very poor band quality and can’t even get on Zoom. Well, I had an instructor at Haida Gwaii. They said, you know, I’d love to be able to join the class, but my Internet access is no good up here. I cannot put the picture in the LMS. . . . We make a whole bunch of assumptions that people have access.” (Faculty Developer 8)	7
	Accessibility and Universal Design for Learning (UDL)	“Well, the thing that comes to mind is the way that certain technologies afford opportunities to create more accessible learning experiences for students. I think that’s a big part of digital literacy for instructors. Without adding a huge amount of work to one’s plate . . . UDL sorts of principles” (Faculty Developer 1)	3
	AI	“AI, that’s got nothing to do with us. So, we’ll have to get on the educational piece because instructors do have to know about AI and academic integrity.” (Faculty Developer 4)	9
	Information Literacy	“I think the education that instructors provide needs to be cognizant of the fact that when their students go out into their profession, they’re not necessarily going to go to the library to look for a book to help solve a problem.” (Faculty Developer 1)	4

	Critical Thinking	“Ways to use AI, that it’s not just students taking information from generative AI and plunking it in” (Faculty Developer 2)	3
	Attitude	“Really the solution lies in one, accepting that more digital tools are a benefit to their classrooms. Two, acknowledge that the fear that we had that we’re going to get replaced by computers and the online classroom and all that, at least in the trades, it’s not going to happen.” (Instructor 1)	3

Note: The table summarizes the codes and subthemes within the theme. “Freq.” indicates frequency, that is, how many times I assigned the code to the data. “AI” refers to artificial intelligence.

**Table 4***Theme: Meaningful Connections*

Subtheme	Codes	Representative Quotes	Freq.
Connection	Collaboration	“I think what helps us here is we work together, supporting each other, sharing our knowledge and information. That is the most helpful.” (Instructor 2)	7
	Connection	“They’re open to reaching out to their peers and ultimately solving the problem. They rise to the struggle and overcome that challenge. So, to me, that’s resilience.” (Instructor 1)	7
Meaning	Meaning	“The ability to just stay engaged and stay positive. To maintain your curiosity and love for what you’re doing. Keep hold of the sense of meaning that teaching brings.” (Faculty Developer 7)	7
Boundaries	Boundaries	“The technology is constantly changing. You have to maintain some sort of boundaries for how it will be used and maintaining well-being.” (Faculty Developer 8)	4
Flexibility	Willingness and Adaptivity	“I think resilience means the willingness to see things in a different way. That is what instructor resilience means to me. That they [instructors] might be very set in a way, they might have done it this way for 25 years, but the resiliency means the willingness to adapt when necessary.” (Faculty Developer 6)	4

Note: The table summarizes the codes and subthemes within the theme. “Freq.” indicates frequency, that is, how many times I assigned the code to the data.