

## Mapping Transversal Competences for Vocational Education Learners in Response to Transformations in the World of Work: A Scoping Review

**Purpose.** This study aimed to develop a shared theoretical foundation for a harmonized taxonomy of transversal competences between technical and vocational education and training (TVET) and the labour market. **Methodology.** A scoping review was conducted to examine the literature published on competences in education and employment. Twenty-nine documents, including scientific articles and governmental reports, were systematically analyzed. The process was supported by consultations with an expert committee to ensure relevance and applicability. **Results.** The review led to a common operational definition of competence as the integrated mobilization of personal and environmental resources to achieve effective and context-appropriate action. Competence is characterized as observable, reproducible, developmental, and situated within specific environments. Building on this definition, a taxonomy of transversal competences was synthesized, structured into three categories: intrapersonal competences (cognitive, communication, information and technology-related, self-management), interpersonal competences (affective, behavioral, self and others' development), and organizational and societal competences (organizational, societal, sustainability-related). This taxonomy offers a coherent framework to strengthen employability, adaptability, and lifelong learning while promoting diversity, equity, inclusion, and sustainable practices in TVET and the labour market. **Originality.** This study responds to the growing need for a shared language between training and employment, offering both theoretical clarity and practical guidance for curriculum design, assessment, and policy development. **Practical Implications.** The taxonomy equips educators and employers with a flexible tool to design inclusive training programs, support diverse learners, and anticipate future workforce needs.

### Introduction

The rapid transformations of the world of work, particularly those driven by digitalization and demographic shifts, represent major societal challenges that intensify the pressure to train competent workers capable of responding to urgent labour needs across economic sectors. These transformations have repercussions on both organizational and individual dynamics (Kuyken and Costanza, 2025). For example, globalization is reshaping the nature of work and increasing the demand for transversal competences that are rapidly mobilized and essential to organizational performance (Clott, 2020). In parallel, the transition to Industry 4.0, characterized by the integration of artificial intelligence, blockchain and the Internet of Things, has profoundly altered competence requirements (Bidet-Mayer, 2016). Demographic changes, including an ageing population and the steady increase in the number of retirees in Canada and other developed countries, are contributing to a marked decline in labour supply (Statistique Canada, 2023). This trend is expected to persist over the next two decades (World Health Organization, 2024). Between 2023 and 2027 alone, this structural transformation of the labour market could affect 23% of jobs worldwide, resulting in a net loss of 14 million jobs (World Economic Forum, 2023). Such upheavals are reconfiguring competences needs, making some obsolete while elevating the importance of others, and creating a growing demand for new competences (Yang and Wu, 2024). These shifting occupational roles generate mismatches between expectations and performance that highlight the urgency of

clarifying the concept of competence and structuring competences, particularly transversal ones, in a coherent and adaptable manner (Elo et al., 2025).

However, the concept of competence is characterized by the coexistence of multiple and sometimes contradictory definitions in the scientific literature (Austin, 2019; Wong, 2020; Yazdani and Farmad, 2016). For example, Tardif (2006, 2017) conceptualizes competence as a “complex knowing-how-to-act” grounded in the effective mobilization and combination of internal and external resources within a family of situations. Le Boterf (2002) emphasizes competence not as the mere possession of resources, but as the ability to mobilize them appropriately in context (Tardif, 2006, 2017; Le Boterf, 2002; Côté, 2018). Other authors describe competence as the capacity to perform activities that combine knowledge, skills and perceptual abilities, and they stress that this capacity is contextual, observable and measurable (Yazdani and Farmad, 2016). This plurality of definitions complicates dialogue between education and employment contexts, where stakeholders may not share the same underlying assumptions when referring to a “competence” (Austin, 2019; Yazdani and Farmad, 2016; Wong, 2020). This issue underscores the need to propose a shared operational definition and a coherent structuring of transversal competences. This effort is crucial to support transitions, anticipate labour market needs and strengthen the alignment between education and employment.

### **Diversity of Learner Profiles and Adaptation of Training Programs**

In this context, the diversification of professional profiles in the labour market, influenced by sex, gender, age, nationality, culture, or abilities constitutes a strategic resource to be valued (Statistique Canada, 2022). This diversity is reflected in postsecondary education cohorts, including technical and vocational education and training (TVET). Nearly one-third of newly enrolled Canadian students between 2015 and 2021 identified as belonging to an ethnic minority (Statistics Canada, 2023a). More recent data confirm that TVET programs attract learners who differ in age, gender, cultural background and migration status (Statistics Canada, 2023b). Designing training activities that take this diversity into account remains a considerable challenge for institutions. They must ensure that all learners, regardless of their profile, can develop their competences, contribute to society and achieve personal fulfillment (Lecours et al., 2023). Research highlights multiple barriers to development and recognition of competences among vulnerable groups such as youth with disabilities (Vérificateur général du Québec, 2020), individuals with intellectual impairments (Letscher et al., 2019), social assistance recipients (Boucher et al., 2020) and immigrants facing systemic exclusion (Conseil supérieur de l'éducation, 2024). These findings underscore the importance of tailoring training approaches to learners' specific needs, taking into consideration their experiences, cultural identities and motivations (Berge, 2022). Developing a taxonomy of competences that reflects identity, social and regional diversity is essential to the design of equitable and relevant curricula. Transversal competences play a fundamental role in ensuring inclusive and quality education while promoting lifelong learning opportunities for all (United Nations Educational, Scientific and Cultural Organization, 2025).

### **Rethinking TVET in Times of Transition**

In the midst of ongoing labour market transformations, TVET serves as both a driver of inclusive development and a strategic tool for preparing diverse populations to meet evolving employment demands while fostering social equity (United Nations Educational, Scientific and Cultural Organization, 2015). The literature increasingly emphasizes the need to strengthen the role of TVET systems in addressing twenty-first century challenges (Marope, Chakroun and Holmes, 2015). This requires greater alignment with emerging labour market needs (Spöttl and Windelband, 2021) and the integration of priorities such as inclusion, equity, and sustainability into training processes (Marope, Chakroun and Holmes, 2015). Despite its recognized importance, TVET often remains poorly aligned with industry demands, revealing a persistent gap between training provision and labour market requirements (Ozer and Perc, 2020; Maclean and Fien, 2017). This underscores the urgency of transforming TVET to better respond to current and future needs. Several countries, including Finland and the United Arab Emirates, have acknowledged the importance of adapting TVET to economic shifts, labour market evolution, and the competences required by new technologies (Hojeij and Al Marzouqi, 2023).

However, this transformation raises conceptual challenges, particularly the tension between technical expertise and transversal competences. The definition, teaching, evaluation, and recognition of transversal competences remain insufficiently clarified (Kemmis, Hodge and Bowden, 2014). The lack of a shared language around transversal competences contributes to this ambiguity, especially given the multiple and sometimes conflicting definitions of competence in the literature (Austin, 2019; Yazdani and Farmad, 2016; Wong, 2020). Although growing attention is being paid to this issue, research on transversal competences in TVET remains limited. The overarching aim of our study is therefore **to develop a shared theoretical foundation for a harmonized taxonomy of transversal competences between TVET and the labour market**, taking into account: (1) the rapid transformations of the world of work in its digital, demographic, and environmental dimensions, (2) the diversity of learners, and (3) the need for coordinated action among stakeholders in TVET and the labour market. The following specific objectives are pursued:

1. Propose a shared operational definition of the concept of competence between TVET and the labour market.
2. Identify transversal competences common to TVET and the labour market.

## **Methods**

### **Design**

A scoping review was conducted (Pollock et al., 2023) to examine the quantity, nature, and range of the literature on our topic of interest. This method was selected for its flexibility, enabling the inclusion of quantitative, qualitative, and mixed-method studies, as well as documents from grey literature (e.g., government reports, practical guides, and competence frameworks).

To optimize the practical application of the results, the research has been managed in collaboration with an expert committee involving stakeholders from TVET and the labour market. The committee was consulted at every stage of the scoping review. Despite the flexibility of the chosen method, a structured procedure was followed to ensure the rigour of our research, in line with established best practices. Accordingly, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) criteria were considered in the development of our research protocol (Tricco et al., 2018).

### **Procedure and Analysis**

Five steps were systematically followed.

#### *Step 1: Define the Research Question and the Inclusion/Exclusion Criteria of Documents*

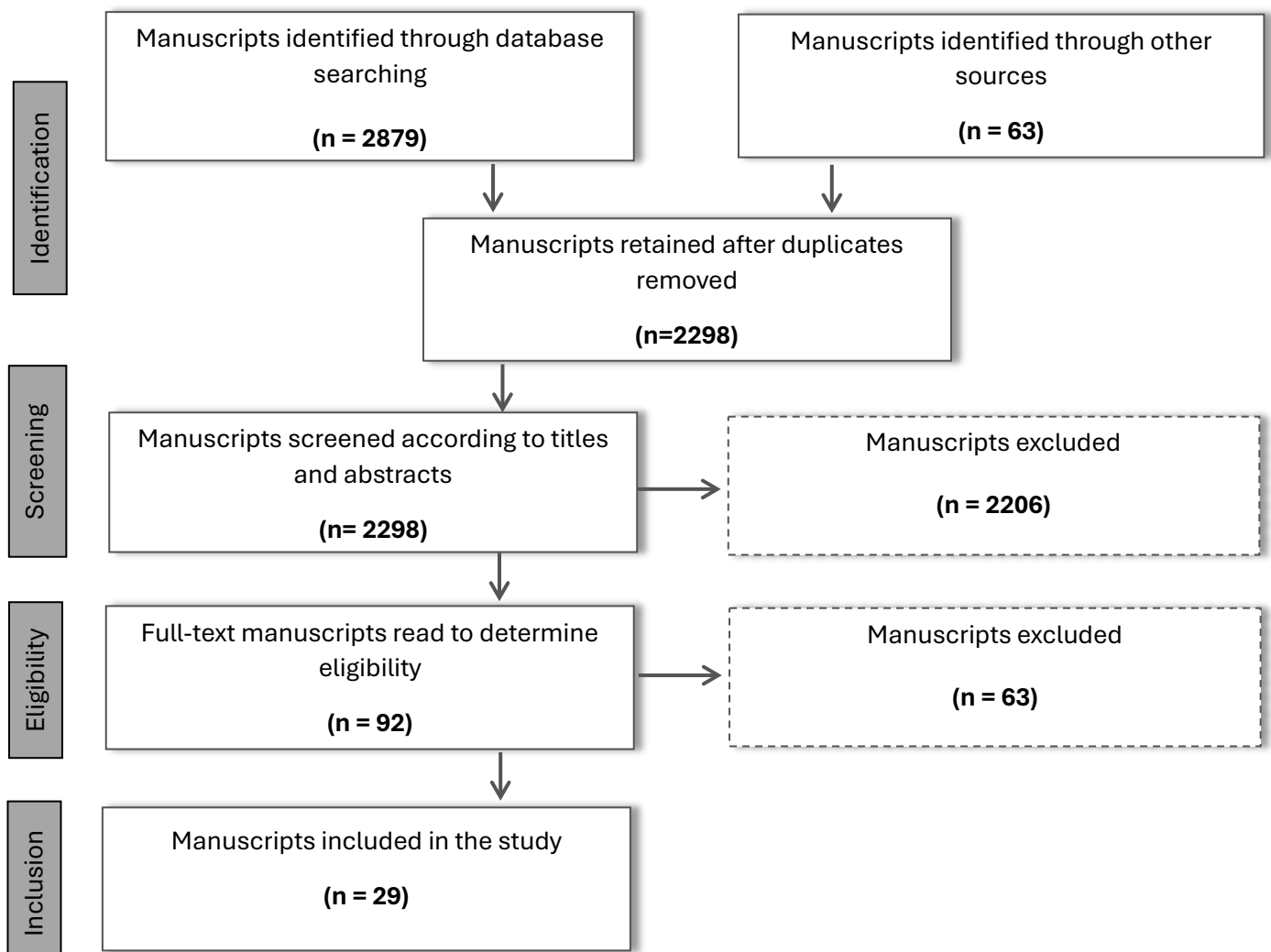
The question that guided our literature search was: “What transversal competences are commonly shared between TVET and the labour market?” All types of documents (e.g., scientific articles, government reports) were included. For feasibility reasons and to provide an accurate picture aligned with new labour market trends (e.g., artificial intelligence, digital health, sustainable mobility, green energy), only documents published in 2010 or later were retained. Also, only documents written in French or English were retained. Documents were excluded if they did not align with the research objectives, lacked explicit models or lists of competences, focused exclusively on non-relevant educational levels (e.g., elementary education), were incomplete, unavailable in full, or duplicated within the inclusion period. The inclusion and exclusion criteria were individually tested on 50 abstracts by two members of the research team to ensure clear understanding, inter-rater reliability, and confirmation that the criteria effectively identified documents relevant to the research question.

#### *Step 2: Conduct the Literature Search*

In collaboration with a consultant librarian, keywords combinations (e.g., competences, skills, frame of reference) were formulated in English and French. They were defined based on three main concepts related to the research question, namely 1) competences, 2) training, and 3) employment. Five databases were selected: Education Source, Business Source Complete, Scopus, Academic Search Complete, ABI/INFORM Global. These databases were linked to relevant fields of knowledge (e.g., social sciences and humanities, human resource management, education, and andragogy). The reference lists of the identified documents were reviewed to see if any had the potential to contribute to answering our research question while meeting the inclusion and exclusion criteria. Finally, a manual search on Google, using keywords like those generated for the database search, was also conducted to optimize the search for grey literature. The literature search was conducted by two members of the research team.

#### *Step 3: Determine the Eligibility of Manuscripts*

Once the documents had been selected, all references were entered into reference management software (i.e., EndNote) and then imported into the Covidence web platform for literature review management. After removing duplicates, two members of the research team selected the documents by separately reviewing the relevance of the documents in two stages: 1) reviewing titles and abstracts, and 2) selecting based on screening full-text articles. Conflicts in document selection were resolved by involving a third reviewer, when necessary. Document eligibility was determined based on their relevance to our research objectives and compliance with the inclusion and exclusion criteria (see Step 1). Collaborative meetings between reviewers were held periodically during the document eligibility determination process to ensure agreement among reviewers. Figure 1 is a flowchart describing the document search process and the final number of documents selected (Moher et al., 2009).



Legend: The figure above originates from the authors of the present article.

Figure 1. Flowchart of the manuscript eligibility determination process

#### *Step 4: Extract and Classify Information*

Independently, two members of the research team extracted information from the documents that contributed to the research objectives. This process was carried out using an extraction grid to reduce variability and bias (Higgins and Deeks, 2008). The extraction grid was developed to meet the needs of the project, drawing on the research team's previous experience and consultations with the expert committee. For example, the following information was documented: authors, year of publication, countries, target populations, fields of training, economic sectors, definition of competence, types of competences, etc. The grid was tested on a sample of 25% of the selected documents before being revised and used for all documents (Pollock et al., 2023).

#### *Step 5: Produce a Critical Synthesis of the Results to Meet the Research Objectives*

This final step involves creating a critical synthesis of knowledge that considers both the characteristics of the selected documents and the description of the extracted data. To do this, the research team used a descriptive interpretive approach to produce a narrative synthesis (Fortin and Gagnon, 2022), which is consistent with the scoping review design (Pollock et al., 2023). All documents were considered to have the same level of importance in the narrative synthesis, regardless of their type (scientific article, grey literature).

## **Results**

### **Description of Selected Documents**

Of the 29 selected documents (see Table I), 11 (38%) are scientific articles and 18 (62%) are professional documents or reports published by an organization or a government. The documents come mainly from Europe (52%) and America (28%). Thirty-eight percent (38%) of the documents were published in the last five years. Half of the documents (52%) are intended for both training and employment contexts, while 5 (17%) target training exclusively and 9 (31%) are designed exclusively for the labour market.

Table I. Summary of Selected References

<b>Author, Year</b>	<b>Document Type</b>	<b>Country</b>	<b>Scope (Education and Training, Labour Market)</b>
U.S. Department of Education (2015)	Government Report	United States	Education and training sector and the labour market
Australian Government (2013)	Government Report	Australia	Education and training sector and the labour market
Scottish Qualifications Authority (2013)	Institutional report	Scotland	Education and training sector
Government of Singapore (2023)	Government Report	Singapore	Education and training sector and the labour market

International Labour Organization (2021)	Institutional report	Switzerland	Education and training sector and the labour market
Alexandre, Granger and Simard (2023)	Institutional report	Canada	Education and training sector and the labour market
Arribas-Aguila, Castaño and Martínez-Arias (2024)	Scientific article	Spain	Education and training sector and the labour market
Avrachan (2023)	Professional blog article	India	The labour market
Balcar, Janíčková and Filipová (2014)	Scientific article	Czech Republic	The labour market
Bartram (2012)	White paper	England	The labour market
Bisschoff and Massyn (2024)	Scientific article	South Africa	Education and training sector and the labour market
Palameta et al. (2021)	Institutional report	Canada	Education and training sector and the labour market
Brewer (2013)	Institutional report	Switzerland	Education and training sector
Carnevale and Smith (2013)	Scientific article	United States	The labour market
Chen and Chang (2010)	Scientific article	England	The labour market
Conseil des ministres de l'Éducation Canada (2020)	Government Report	Canada	Education and training sector and the labour market
Cobo (2013)	Scientific article	United Kingdom	Education and training sector and the labour market
European Commission (2019)	Government Report	European Union countries	Education and training sector
Fetahu and Lekli (2023)	Scientific article	Albania	Education and training sector and the labour market
Fidler and Williams (2016)	Institutional report	United States	Education and training sector and the labour market
Joie-La Marle et al. (2022)	Scientific article	France	The labour market
Leitner and Reiter (2020)	Institutional report	Austria	Education and training sector and the labour market
Lukács, Budavári-Takács and Suhajda (2016)	Scientific article	Hungary	The labour market
Majid et al. (2019)	Scientific article	Singapore	The labour market
Martinaitis (2014)	Scientific article	29 European countries	The labour market
McLean et al. (2012)	Government Report	Australia	Education and training sector and the labour market
Moldovan (2020)	Conference paper	France, Austria, Spain, Romania, Sweden	Education and training sector and the labour market
National Network of Business and Industry Associations (2014)	Institutional report	United States	Education and training sector and the labour market
United Nations Children's Fund (2019)	Institutional report	United States	Education and training sector

## **Common Operational Definition of the Concept of Competence**

Our analysis of the definitions of the concept of competence found in the selected documents leads us to propose an operational definition that is useful for both the employment and TVET sectors. Competence emerges as a multidimensional concept composed of several complementary components. It can be defined as the integrated mobilization of personal and environmental resources for the purpose of effective and appropriate action (European Commission, 2019; Arribas-Aguila, Castaño and Martínez-Arias, 2024; Balcar, Janíčková and Filipová, 2014; Martinaitis, 2014).

From this perspective, competence refers to an individual's ability to mobilize personal resources, such as knowledge, skills, behaviours, and abilities (Arribas-Aguila, Castaño and Martínez-Arias, 2024; Martinaitis, 2014; Brewer, 2013; Bartram, 2012). This mobilization is not an innate personality trait, but rather an observable, reproducible, and contextual behavior that can be learned (Palameta et al., 2021). Personal resources must be combined with environmental resources to address a problem or meet a need (Arribas-Aguila, Castaño and Martínez-Arias, 2024; United Nations Children's Fund, 2019; Bartram, 2012). For instance, a customer service representative draws on their communication skills (personal resources) as well as digital request management tools (environmental resources) to resolve a client's complaint.

Competence is also closely tied to performance and the achievement of objectives (Arribas-Aguila, Castaño and Martínez-Arias, 2024; Martinaitis, 2014; Brewer, 2013; Bartram, 2012). Being competent implies the ability to act appropriately in diverse situations, whether completing a project, managing a conflict or improving a process (Alexandre, Granger and Simard, 2023; Martinaitis, 2014). For example, a student in a management techniques program shows competence by meeting the objectives of a simulated team project, planning tasks, coordinating activities and evaluating results.

Another essential characteristic of competence is its evolving and adaptive nature (Alexandre, Granger and Simard, 2023; Palameta et al., 2021; Joie-La Marle et al., 2022; Carnevale and Smith, 2013). It develops progressively from initial training through professional practice and differentiates levels of individual performance (Alexandre, Granger and Simard, 2023; Arribas-Aguila, Castaño and Martínez-Arias, 2024). Competence supports adaptation to change, enabling individuals to make informed decisions and adjust their actions (Bartram, 2012; Alexandre, Granger and Simard, 2023). For example, a nurse in training learns to apply care protocols safely. With experience and continuing education, that nurse progressively develops the ability to adapt interventions to complex situations, such as prioritizing care in an overloaded unit or supporting families in palliative contexts. This progression illustrates how competence is built through practice, adjusted to real-world conditions, and supports autonomous decision-making in dynamic environments.

Competence also serves as a framework for understanding and predicting performance levels (Martinaitis, 2014). Some approaches use matrices to classify competences according to

their complexity or degree of mastery, thus making it possible to map learning trajectories and identify development paths (Arribas-Aguila, Castaño and Martínez-Arias, 2024). For instance, problem-solving can range from applying known solutions in familiar contexts to generating innovative strategies in complex or uncertain situations.

Finally, competence is always situated within a specific context, whether educational or professional (Arribas-Aguila, Castaño and Martínez-Arias, 2024; United Nations Children's Fund, 2019; Bartram, 2012). To be competent means acting in a way that reflects the standards, priorities, and realities of a given environment (Alexandre, Granger and Simard, 2023). A trainer must therefore adapt teaching strategies to their group of learners, just as a manager must tailor their interventions to organizational objectives and constraints.

### Transversal Competences Common to TVET and the Labour Market

The competences identified in the analyzed documents were grouped into three broad categories: (1) intrapersonal, (2) interpersonal, and (3) organizational and societal. Each category encompasses specific competence domains, presented in a synthesized manner, with their frequency of occurrence expressed as a percentage in Table II.

Table II. Summary of the organization of competences into three categories and occurrence of competences (%) in the reviewed documents

Intrapersonal	Interpersonal	Organizational/societal
<ul style="list-style-type: none"> <li>● <b>Cognitive (72%)</b> <ul style="list-style-type: none"> <li>○ Think (48%)</li> <li>○ Manage numeracy requirements (17%)</li> <li>○ Solve problems (66%)</li> <li>○ Innovate (48%)</li> <li>○ Make sound decisions (17%)</li> <li>○ Plan and organize (41%)</li> <li>○ Initiate actions (48%)</li> </ul> </li> <li>● <b>Communication (83%)</b> <ul style="list-style-type: none"> <li>○ Express ideas orally and in writing (83%)</li> <li>○ Decode oral and written language (69%)</li> </ul> </li> <li>● <b>Information and technology-related (69%)</b> <ul style="list-style-type: none"> <li>○ Handle information (34%)</li> <li>○ Operate technologies (48%)</li> <li>○ Interpret technologies (28%)</li> </ul> </li> <li>● <b>Self-management (48%)</b> <ul style="list-style-type: none"> <li>○ Sustain mental effort (14%)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Affective (45%)</b> <ul style="list-style-type: none"> <li>○ Show emotional intelligence (20%)</li> <li>○ Demonstrate empathy (24%)</li> <li>○ Express social intelligence (21%)</li> <li>○ Display interpersonal awareness (28%)</li> </ul> </li> <li>● <b>Behavioral (79%)</b> <ul style="list-style-type: none"> <li>○ Collaborate effectively (76%)</li> <li>○ Provide leadership (34%)</li> </ul> </li> <li>● <b>Self and others' development (58%)</b> <ul style="list-style-type: none"> <li>○ Pursue in continuous learning (52%)</li> <li>○ Self-assess (21%)</li> <li>○ Coach (17%)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Organizational (58%)</b> <ul style="list-style-type: none"> <li>○ Commit to the organization (48%)</li> <li>○ Focus on client needs (31%)</li> <li>○ Uphold professionalism (45%)</li> </ul> </li> <li>● <b>Societal (41%)</b> <ul style="list-style-type: none"> <li>○ Adhere to DEI principles (41%)</li> </ul> </li> <li>● <b>Sustainability-related (17%)</b> <ul style="list-style-type: none"> <li>○ Promote for sustainable development (17%)</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>○ Cope with stress and pressure (28%)</li> <li>○ Maintain personal well-being (24%)</li> <li>○ Adapt to change (62%)</li> <li>○ Exhibit self-confidence (14%)</li> </ul>		
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Legend: Green = 66% and above, Purple = 34 % à 65 %, Blue = 33 % and below (% of documents addressing the competence)

### Competence 1. Intrapersonal Competences

Intrapersonal competences encompass those that an individual mobilizes to effectively manage their thoughts, emotions, behaviours, and learning. They form essential foundations for functioning autonomously, engaging in lifelong learning, and navigating complex situations in both training and employment contexts. This category comprises four domains.

First, **cognitive competences** include the ability to think, manage numeracy requirements, solve problems, innovate, make sound decisions, plan and organize, and initiate actions. These competences enable individuals “*to analyze, reason, solve problems, plan, organize, and make sound decisions in their work*”<sup>1</sup> (U.S. Department of Education, 2015, Section Explore the Framework). They also include the ability to “*use, apply, interpret, [...], create, and critique information*” (Alexandre, Granger and Simard, 2023, p. 56). These competences are fundamental for effectively managing complex and diverse situations in the workplace.

Second, **communication competences** concern the ability to express ideas orally and in writing, as well as to decode oral and written language. They encompass “*the ability to understand written/spoken texts, express concepts, thoughts, feelings, facts and opinions in both oral and written form (listening, speaking, reading and writing) and to interact linguistically in an appropriate and creative way in a full range of societal and cultural contexts*” (Moldovan, 2020, p. 274-75). These competences are essential for the transmission and reception of information in various educational and professional contexts.

Third, **information and technology-related competences** refer to the ability to handle information, operate technologies, and interpret technologies. They are demonstrated through the “*ability to search, select, evaluate and organize information in order to effectively and efficiently mobilize relevant information*” (International Labour Organization, 2021, p. 31, p.31) as well as in the “*ability to re-structure and model sourced information to produce personal interpretations of data.*” (International Labour Organization, 2021, p. 31). In this sense, they reflect “*the ability to use technology and digital tools to find, manage, apply, create, and share information and content*” (Palameta et al., 2021, p. 28), in a constantly evolving environment. These competences play a key role in developing digital literacy and in handling knowledge.

Fourth, **self-management competences** include the ability to sustain mental effort, cope with stress and pressure, maintain personal well-being, adapt to change, and exhibit self-

<sup>1</sup> The excerpts presented in this section are drawn from the documents analyzed as part of our review. Some have been translated from French into English for the purposes of publication, with care taken to preserve their original meaning.

confidence. To effectively mobilize these competences, the individual must, in particular, be able to “*maintain attention without being distracted*” (Joie-La Marle et al., 2022, p.123), and “*possess the ability to take on challenges and to bounce back when faced with more difficult or stressful situations or contexts in the workplace*”(Alexandre, Granger and Simard, 2023, p.34), including when it comes to “[*work*] *under workload conditions and extended hours*” (Fetahu and Lekli, 2023). These competences are fundamental for the development of autonomy, resilience, and personal balance.

## *Competence 2. Interpersonal Competences*

Interpersonal competences enable individuals to interact constructively, respectfully, and effectively with others. They draw on affective, social, relational, and ethical dimensions that are essential for collaboration, emotion management, and the quality of relationships in training or work settings. This category is divided into three domains.

First, **affective competences** involve the ability to show emotional intelligence, demonstrate empathy, express social intelligence, and display interpersonal awareness. They help promote “*empathy and understanding, enhancing relationships and conflict-resolution capabilities within an organization*” and, through the recognition and regulation of emotions, they make it possible to “*navigate conflicts more effectively, promoting constructive dialogue and resolution*” (Avrachan, 2023, Section Identifying Key Soft Skills for Organizational Success). These competences serve as levers for developing harmonious and respectful relationships in training or work settings.

Second, **behavioral competences** concern the ability to collaborate effectively and to provide leadership adapted to different contexts. For example, effective collaboration involves the capacity to “*work in diverse teams effectively and respectfully*” (Aggarwal, 2021, p.29), while leadership requires the ability to “*inspire and motivate employees, driving them toward shared goals*” (Avrachan, 2023, Section Identifying Key Soft Skills for Organizational Success). An excerpt from one of the selected documents highlights the scope of effective collaboration:

*When employees collaborate effectively, they combine their diverse skills and perspectives, leading to greater creativity and problem-solving capabilities [...] trust and respect among team members, encouraging open communication and a willingness to share ideas. This atmosphere of mutual support results in improved efficiency and innovative thinking (Avrachan, 2023, Section Identifying Key Soft Skills for Organizational Success).*

These competences are essential for active participation in teams, conflict resolution, and the coordination of collective actions.

Third, **self and others’ development competences** include the ability to pursue continuous learning, to self-assess, and to coach. These competences support both personal and professional growth, enabling, for instance, the capacity to “*drive self-development and the achievement of long-term career goals*” (Government of Singapore, 2023, Section CCS Reference Documents), as well as the development of others by encouraging individuals to

“coach, mentor and give feedback.” (Brewer, 2013, p. 10). Such competences are essential to ensure continuous evolution and effective support across diverse professional contexts.

### *Competence 3. Organizational and Societal Competences*

Organizational and societal competences encompass those that enable a person to contribute effectively to an organization while assuming social, ethical, and environmental responsibility. They support participation in structured, inclusive, and sustainable work and learning environments. This category includes three domains.

First, **organizational competences** refer to the ability to commit to the organization, to focus on client needs, and to uphold professionalism. They are expressed, for instance, through the adoption of behaviours that are “coherent with personal values and aligned with those of the organization” (Bartram, 2012, p.7) and through the capacity to “manage relationships and work collaboratively and effectively with others to achieve goals” (Government of Singapore, 2023, Section CCS Reference Documents). These competences reflect a person’s ability to act responsibly, effectively, and in alignment with collective objectives.

Second, **societal competences** encompass the ability to adhere to diversity, equity, and inclusion (DEI) principles. Acting ethically involves “developing a sense of fairness in order to demonstrate justice and impartiality” while respecting diversity and fostering inclusion entails “knowing how to respect others” by treating people “with empathy, consideration, and dignity” (Alexandre, Granger and Simard, 2023, p.35). These competences strengthen the ability to operate in diverse environments by promoting social justice and respect for differences.

Third, **sustainability-related competences** refer to the ability to promote sustainable development. They are demonstrated, in particular by designing tasks “in accordance with compulsory health and safety/environment regulation” (Moldovan, 2020, p.275). These competences encourage the adoption of eco-responsible behaviors and contribute to building a more sustainable future.

## **Discussion and Practical Implications**

This discussion highlights three major contributions of the study. First, it clarifies the concept of competence by proposing a shared operational definition grounded in transversality and multidimensionality, thereby offering a common language between training and employment. Second, it demonstrates how the integration of transversal competences into TVET can address the diversity of learner profiles and strengthen DEI. Third, it outlines the practical implications of the proposed taxonomy as a tool to design adaptive curricula, inclusive pedagogical approaches, and assessment frameworks aligned with labour market transformations.

### **Clarifying Competence: Transversality and Multidimensionality for the Future of Work**

The performance of TVET systems relies on close articulation between institutions, employers, and policymakers (Calero López and Rodríguez-López, 2020; Boyer, 2017). Training

models that integrate schools, learners, and employers achieve better results than those relying solely on school-based approaches (Renold et al., 2018). Such articulation is effective only when grounded in a shared definition of competence. In the absence of a universally accepted definition (Arribas-Aguila, Castaño and Martínez-Arias, 2024), our study proposes an operational definition characterized by two attributes: its transversal nature and its multidimensional structuring.

Transversality refers to competences transferable across diverse tasks and contexts, making them particularly valuable in labour markets shaped by globalization and technological change (Sá and Serpa, 2018). Competences such as communication, teamwork, initiative, and problem-solving are increasingly sought by employers and considered central to organizational performance (Baneres and Conesa, 2017; Calero López and Rodríguez-López, 2020). Their integration into TVET programs is essential to prepare graduates for uncertain environments and lifelong adaptability (Khaled Gijón et al., 2025).

Multidimensionality emphasizes that competence results from the interplay of personal resources, environmental supports, and situational demands (Frank et al., 2010). This approach moves beyond earlier definitions focusing mainly on individual traits or knowledge (Spencer and Spencer, 2008; Parry, 1996). It underscores that competence develops progressively, differentiates performance levels, and supports continuous learning (Alexandre, Granger and Simard, 2023; Bartram, 2012). For example, a student in a management program demonstrates competence not only by completing a project but also by coordinating activities and evaluating results in context. Similarly, a nurse develops competence by progressing from protocol adherence to adaptive decision-making in complex clinical settings. Recognizing these evolving and contextually anchored dimensions underscores the need for flexible, adaptive training programs.

By combining transversality and multidimensionality, our definition provides a robust framework for TVET institutions, employers, and policymakers to align curricula with labour market transformations.

This contribution responds directly to the need to go beyond reductive approaches to competence, which sometimes isolate a single facet of human performance, whether technical knowledge detached from context, personal traits treated as fixed dispositions, or observable behaviors interpreted without attention to meaning, power relations, and enabling conditions (Hodge, 2016). Our definition does so by defining competence as an integrated, situated, and developmental capacity to mobilize diverse resources purposefully in context, while explicitly accounting for the social, organizational, and societal conditions.

Moreover, our definition offers a conceptual framework that is flexible enough to be used by both education actors and labour market participants, because it articulates competence in terms of purposeful mobilization of resources in context, rather than prescribing a single pedagogical model or occupational standard. In education settings, this framing can inform curriculum design, learning outcomes, inclusive pedagogies, and assessment strategies by

clarifying what it means to develop and demonstrate transversal competences across training pathways. In labour market settings, it can support recruitment and selection practices, onboarding, performance appraisal, and professional development by providing a shared language to describe expectations, recognize competence in varied work situations, and identify the conditions that enable effective performance. By bridging these perspectives, the definition helps align training and employment systems, facilitates dialogue across stakeholders, and strengthens the transferability of transversal competences across sectors and career transitions.

### **Competence as a Lever for Diversity, Equity, and Inclusion in TVET**

The proposed taxonomy also contributes to DEI, a dimension insufficiently addressed in many competence frameworks (Pirzada, 2023; International Labour Organization, 2017). While most reviewed documents emphasized employability, few engaged with identity-based diversity or systemic barriers. Our taxonomy fills this gap in several ways.

First, it draws on sources from both training and employment contexts, ensuring that diverse groups, such as persons with disabilities, immigrants, older learners, and racialized individuals, are explicitly considered (Statistics Canada, 2023a). This allows program design to account for varied needs, such as accessibility tools, differentiated pathways, or recognition of prior learning. For instance, in computer science programs, the taxonomy could guide tailored approaches for a newcomer requiring language support, an experienced worker updating digital skills, or a learner with disabilities using assistive technologies.

Second, one category of the taxonomy explicitly addresses organizational and societal competences, integrating DEI-related competences (e.g., fairness, respect for diversity, and recognition of implicit biases). Beyond naming these competences, the taxonomy may help their operationalization in concrete practices, for instance by seeking the ability to act impartially in decision-making, to create inclusive learning or working environments, and to ensure accessibility of organizational processes. By embedding these competences within TVET curricula, societal responsibilities are placed on an equal footing with technical training, reinforcing the idea that professional expertise cannot be dissociated from ethical and inclusive practices.

Third, particular attention to inclusive labelling is essential to prevent exclusion. For example, oral and written communication competences must explicitly encompass sign language and alternative communication modes to avoid marginalizing deaf or hard-of-hearing learners. Similarly, digital competences should recognize the use of assistive technologies by learners with disabilities, while self-management competences should be described in ways that reflect diverse cultural understandings of resilience and adaptability. Such inclusive labelling ensures that competences are represented without bias, reflect varied lived experiences, and remain accessible to all, thereby positioning TVET as a key actor in advancing equity and social justice.

Finally, the taxonomy promotes the recognition of competences that are often invisible, such as self-management competences (e.g., sustaining effort and coping with stress), affective

competences (e.g., demonstrating empathy and interpersonal awareness), or societal competences (e.g., recognizing implicit biases and fostering inclusion). Highlighting these competences helps learners see themselves reflected in programs and enables organizations to value varied experiences. In this way, TVET strengthens its role as a driver of inclusion and social justice.

### **Practical Implications**

The findings of this scoping review provide a structured taxonomy of transversal competences that serves as a reference framework to guide the design and adaptation of TVET programs. By drawing on the three categories of competences and their subcompetences, program designers, teachers, and trainers can develop coherent pedagogical approaches, define observable learning indicators, and design shared assessment tools. This structuring also facilitates the creation of inclusive learning environments tailored to a constantly evolving labour market. Concretely, training modules could be designed to strengthen intrapersonal competences by developing learners' ability to solve technical problems, to express themselves and understand oral and written language, to use specialized digital tools, and to adapt to change. Similarly, training programs could aim to foster interpersonal competences by cultivating emotional and social intelligence, empathy, soft skills, collaboration, adaptive leadership, continuous learning, self-assessment, and mentoring, to promote harmonious relationships, conflict resolution, and collective professional growth. Finally, training content integrating organizational and societal dimensions could support the acquisition of these competences by embedding respect for the environment and DEI at the core of organizational practices. Integrating these dimensions strengthens graduates' employability while fostering greater coherence between the expectations of training institutions, educators, and employers.

### *Limitations*

This scoping review nonetheless presents certain limitations related to the methodological choices made. First, the strict selection criteria applied to the documents, particularly the exclusive inclusion of publications issued after 2010, allowed for a reflection of current labour market realities but may have led to the exclusion of earlier documents with historical or conceptual value. In addition, the deliberate omission of sector-specific models tied to particular professional disciplines was intended to build an intersectoral and transferable foundation of competences but came at the expense of certain professional specificities. Furthermore, the exclusion of documents written in languages other than French or English may have introduced a geolinguistic bias, thereby limiting the diversity of sources analyzed. Finally, the study intentionally focused on transversal competences common to TVET and the labour market, which excludes technical competences or those specific to certain trades or professions.

### **Conclusion**

This scoping review highlights the strategic role of transversal competences in shaping TVET that is responsive to rapid labour market transformations while advancing DEI and sustainability. By proposing a shared operational definition of competence and a taxonomy

structured across intrapersonal, interpersonal, and organizational and societal domains, the study provides a foundation for bridging education and employment, supporting inclusive pedagogies, and strengthening social cohesion. The results of this study not only clarify conceptual ambiguities but also offer practical guidance for designing adaptable programs that enhance employability, foster lifelong learning, and address systemic barriers faced by diverse learner populations. In doing so, it contributes to current debates on the transformative capacity of TVET to support workforce resilience, social mobility, and sustainable development, and points toward the need for empirical validation in diverse contexts to confirm its relevance and transferability. Building on these contributions, several avenues for empirical research emerge. Future research could first empirically validate the proposed taxonomy of transversal competences by examining how the competence families are perceived, mobilized, and assessed in different TVET programs and labour market sectors. Case studies, workplace observations or surveys with learners, teachers, and employers could document the extent to which the identified competences are observable, transferable across occupations, and useful for curriculum design and assessment tools. A second line of inquiry could focus on the inclusive character of this taxonomy by analysing how it is experienced by learners from historically marginalized groups, such as persons with disabilities, older workers or immigrants, in order to identify potential biases in competence labelling and generate recommendations to strengthen its contribution to DEI within TVET systems. Ultimately, advancing this research agenda will require sustained collaboration between TVET institutions, employers, and learners to codevelop evidence informed implementation tools and indicators that translate the taxonomy into equitable, context sensitive practices.

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