

What is competence? A shared interpretation of competence to support teaching, learning and assessment

Research Report

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Introduction

The concept of competence has propagated across the educational landscape, including in vocational education and training¹; general education; primary, secondary and higher education; and language learning. In recent years, attention on competence has amplified, as it has become a key focus of international debates on learning, curricula, and assessment within general education (European Commission, 2019; OECD, 2017; UNESCO, 2016). This is because developing competence is one of the key goals of education, having value not only for learners but for the economy and society more widely. Someone who is competent in a domain has the capability to use the body of knowledge and skills of that domain to accomplish tasks and goals beyond the educational or training programme. Therefore, competent people contribute constructively within workplace and life settings. Competence is closely related to the notion of proficiency and mastery used in fields such as mathematics and language (Council of Europe, 2001; Rycroft-Smith & Boylan, 2019).

It can, however, be very challenging to engage with discussions and make decisions about competence because it is a concept that is not interpreted in the same way by everyone. This is a widely recognised challenge of work on competence (Ashworth & Saxton, 1990; Rychen & Salganik, 2001). Indeed, there are many different definitions, models and approaches to integrating competence within teaching, learning and assessment (Weinert, 2001). Adding to this challenge is the fact that the term ‘competence’ is often used interchangeably with other terms such as ‘skill’, ‘outcomes’, and ‘behaviour’, which dilutes the distinctiveness of the concept of competence. And, despite various efforts to broaden its use, competence can still more easily be viewed as a concept that is relevant only for vocational educational and training, even though this is not the case. This means that its applicability to general education can often be overlooked. Some of these views may stem from inadequate understandings of what competence means (Hager & Gonczi, 1996).

This research report presents an interpretation of competence that is particularly appropriate to the diverse range of educational areas focused on within Cambridge University Press & Assessment². This interpretation is summarised in the following definition³ and Figure 1.

Definition: *Competence* is the ability to integrate and apply contextually-appropriate knowledge, skills and psychosocial factors (e.g., beliefs, attitudes, values and motivations) to consistently perform successfully within a specified domain.

¹ Vocational education and training includes both initial and continuing professional training.

² Cambridge University Press & Assessment are hereafter referred to as ‘Cambridge’.

³ See the “Definition of competence” section for definitions of its key terms.

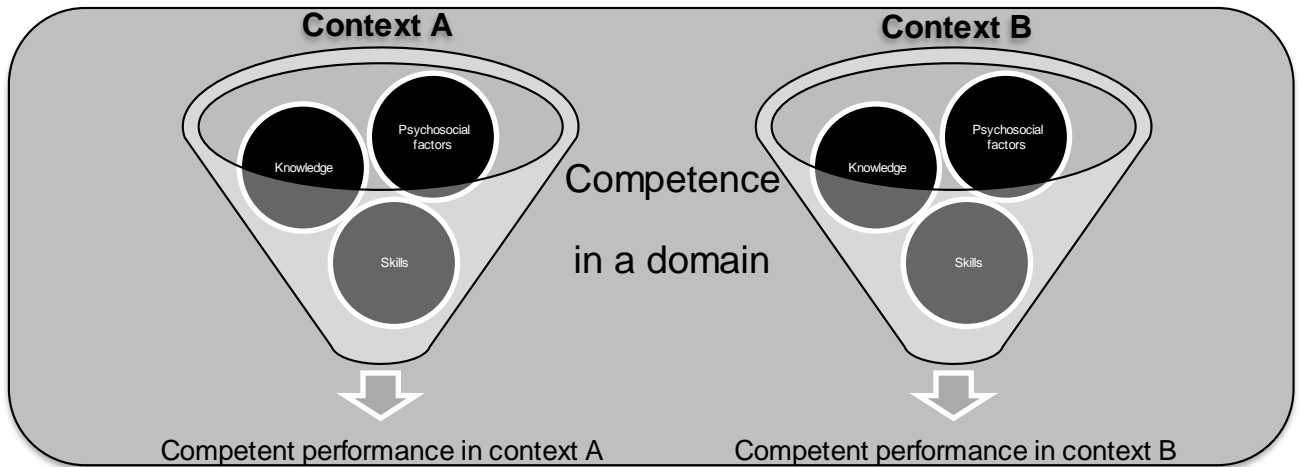


Figure 1. Visual representation of our definition of competence.

Figure 1 illustrates that having competence in a domain (grey box) means being able to perform competently in different contexts (e.g., contexts A and B) in that domain. A competent person integrates and applies the contextually-appropriate combinations of knowledge, skills and psychosocial factors.

This definition reflects an integrated and comprehensive approach to competence, which is based on reviewing various areas of research, including: 1) the extensive literature on competence within the field of vocational education and training, as competence has been very well theorised in this area; 2) literature discussing competence in the context of general education; and 3) the outputs of the Organisation for Economic Co-operation and Development (OECD)'s DeSeCo⁴ project, which examined literature on competence from a wide range of areas of education and psychology. In addition, in developing this definition we consulted with colleagues across Cambridge University Press & Assessment who are experts in developing and delivering educational products and services, including assessment, qualifications and curricula as well as teaching and learning materials.

Having a definition of competence (that is comprehensive and research-informed) has wide-reaching benefits, including that it:

- Encourages an analytic approach to assessment, teaching and learning.
- Indicates how to break down competence appropriately, which supports high quality teaching, assessment and certification. Note that breaking down competence is not the same as taking a reductionist view of competence, which separates out the different elements of competence without paying attention to how these elements are integrated within contexts.
- Ensures that the fundamental features of competence are kept at the forefront of discussions and decisions on competence.

⁴ Details of the OECD's Definition and Selection of Competencies (DeSeCo) project can be found at: <https://www.oecd.org/education/skills-beyond-school/definitionandselectionofcompetenciesdeseco.htm>

- Makes us better placed to respond to clients/customers who want to engage with us around issues of how competence links with models of curriculum, learning, and assessment.

The value of having such a definition also becomes apparent when we consider risks that may arise from having a superficial understanding of competence, which include:

- Dividing up the teaching of a subject in an inappropriate or ineffective way.
- Omitting the teaching of valuable information/content.
- Wasting learners' time.
- Wasting public money on teaching that is ill-founded.
- Failing to develop learners' competence.

About this report

What is the aim of this report?

The aim of this report is to build a shared understanding of competence by providing clarity around the concept and its implications for educational practice. We present an understanding of competence that is research-based, relevant and appropriate for diverse educational contexts. This will help to create stimulating, thoughtful and productive discussions about competence, and advance how we engage with competence when developing educational programmes. This report is intended to have broad applicability, having relevance for competence in diverse areas and modes of education (e.g., primary to higher education; vocational and general education; face-to-face delivery; digital; blended; hybrid).

What is discussed in this report?

This report focuses specifically on discussing the definition of the overall concept of competence, as this is the necessary foundation for developing an educational programme or product that aims to be based around competence. We need to be sure about what we mean by competence from an overall perspective before we can make more specific decisions about competence, such as which areas of competence to include in educational programmes. Without a comprehensive understanding of overall competence, we run the risk of creating educational programmes that are only superficially related to competence, ultimately limiting their value.

We discuss what we mean by competence in three main sections, with information in each section building on the previous one. The first section highlights some key questions that may be raised about competence, in order to provide context for our definition and later discussions. In the second section, we present the unified definition of competence. In the third section, we expand on the definition by delving into a discussion of the key principles that underlie our interpretation of competence.

Key questions around competence

Why do we talk about ‘competence’ rather than ‘competency’?

The terms ‘competence’ and ‘competency’ are often used interchangeably. However, when we use these terms with distinct meanings, we can have more productive conversations about competence. According to Hyland, ‘competence’ attaches to the person and describes their broad qualities in relation to a particular standard (e.g. being a competent driver). On the other hand, competencies are narrower, atomistic elements that attach to a task or activity (e.g. the completion of a particular driving manoeuvre). Based on this distinction, Hyland suggests using the term ‘competence’ for “broad groups of general capacities” and using competency “as a label for specific performances or aspects of activities” (Hyland, 1994, p.21). We follow his recommendation and use the two terms to signify different degrees of specificity. We reserve the term “competence” to refer to overall competence and the term “competency” to refer to specific competencies. We recommend that the reader uses these terms consistently in this way, as it will add clarity to discussions around competence. Then, we simply use the terms “competences” and “competencies” as the pluralised forms of competence and competency respectively.

Where does the idea of competence in vocational and general education come from?

‘Competence’ is an important topic of discussion in curriculum theory about general education as well as in vocational education and training. But these discussions have very different origins; they are not identical, and the differences are important.

When it comes to vocational education, ‘competence’ has long been a critical focus of established approaches to professional and industrial training, and still is. In particular, the early ‘competence movement’ in industrial and military training focussed on rapid training, reduced learning time and tight linkage with task requirements. This was influenced by Fordist approaches to the organisation of industrial labour (Davies, 1976). The systematic approach to linking goals with precise specification of specific learning objectives proved attractive to those developing teacher training, initially in the United States and then globally. This became particularly prevalent in the 1970s and 1980s (Tuxworth, 1989). In contrast, it can be less obvious where the concept of competence comes from within general education. Yet, notions of competence can be seen within philosophies of liberal education going back hundreds of years, where one of the aims has been to produce independent and critical thinking citizens (Gary, 2006; Løvlie & Standish, 2002). More recent trends for broad and balanced curricula also have aims to equip learners for life after education, with general education aiming to prepare students to meet economical and societal needs. Related to this is the drive to make learning more relevant to the learners’ lives outside the classroom, which is also part of strategies to enhance learner engagement.

Running through these two areas, we can see that the notion of competence has long been used as a tool for improving education and training. One reason is that competence focuses attention on “what people can *do*” (Bridges, 1996, p.364) as opposed to merely what people know (Bridges, 1996; Mulder, 2012). Because of this, competence has tended to gain

particular traction when there has been dissatisfaction with traditional, knowledge-based educational systems for preparing learners for the labour market or society more widely (Mulder, 2012; Priestley & Sinnema, 2014). Although competence initially took hold as part of reforms to vocational education and training, most notably for teacher training programmes in the United States, more recently it has also become increasingly influential within policies for reforming general education, including school curricula in primary and secondary education (OECD, 2018; Priestley & Sinnema, 2014).

Despite having the same overarching goal of improving education, vocational and general education policies have tended to focus on competence from different perspectives, due, to some extent, to their different origins. In vocational education, competence has more typically been viewed from a discipline-specific perspective, where the discipline (e.g., occupational role) is the starting point for defining competence and identifying the underlying competencies. In contrast, in general education it has been more commonly viewed from a cross-disciplinary perspective, where the focus has been on identifying areas of competence that apply to a variety of disciplines, also known as key competencies. For example, the OECD highlights three transversal (cross-disciplinary) categories (acting autonomously, interacting in socially heterogeneous groups, and using tools interactively) (Rychen & Salganik, 2003) while the European Commission (2019) draws attention to eight key competences that include literacy, multilingual, digital and 'personal, social and learning to learn'.

Attention to competence has not always come from drives to reform education. In the field of language learning, for example, the concept of competence has been used extensively to develop theories about the construct of language proficiency, which is used to inform teaching, learning and assessment. Research is continually devoted to identifying which areas of competence underpin language proficiency, and how the construct of each identified area of competence should be defined (Council of Europe, 2001; Galaczi & Taylor, 2018). The level of research into the constructs of language competences sets an important example for work that engages with competence; it highlights that constructs of competence are dynamic, and, therefore, need to be informed by theoretical and empirical research, and regularly evaluated with current evidence.

Why is the concept of competence of value to educational providers?

From an educational perspective, competence as a concept has value for three main reasons. First, it helps to explain how people learn effectively (i.e., it has explanatory potential/power). There are various theoretical explanations for how basing approaches to learning on competence can contribute to the efficacy of an education system, although implementation of this within practice is challenging and needs careful consideration to prevent a reductionist approach being adopted (Hager & Gonczi, 1991; Hoffmann, 1999). Second, the concept of competence, as defined through an integrated and comprehensive perspective, makes us think about the diverse range of factors (e.g., values as well as knowledge and skills) that are necessary for performance, and how they integrate together to enable learners to perform successfully in a particular domain. This can enrich pedagogy and learning, especially when assessments and curricula are designed from such an

integrated perspective. Third, the concept of competence has educational value because it has wide-ranging applicability. Competence is not restricted to any particular national education system or tradition, is not specific to any particular subject or age grouping, and is not tied to any particular education or learning phase.

Definition of competence

Given the broad educational remit and mission of our organisation, there is particular value in viewing competence from an integrated and comprehensive perspective (Hager & Gonczi, 1996; Mulder, 2012; Rychen & Salganik, 2001). The integrated aspect means that competence is viewed in relation to the characteristics of both the competent person and the contexts in which the competence is used. The comprehensive aspect concerns the analysis of these characteristics, whereby consideration is given to all the characteristics of the person and context that are relevant to the competence. This approach has explanatory and predictive power over more reductionist perspectives that focus on specific aspects of competence such as the externally visible outcomes of competence (i.e., performance or behaviour) or person characteristics devoid of context (Hager & Gonczi, 1996; Hyland, 1994). Taking an integrated, comprehensive approach to competence does not preclude focusing on specific elements of competence in educational programmes, products or services but it is important that any decisions of that kind are considered within the context of the overall meaning of competence.

Below is the definition of competence that encapsulates our interpretation of competence, presented as a single sentence that highlights its key features. The definition does not prescribe how to abstract or integrate the concept of competence within teaching, learning, curricula and assessment. It exists to offer a research-informed, coherent understanding of competence, which is essential for developers and providers of educational programmes to be able to operationalise aspects of this for practical purposes. We believe that the high-level definition presented here constitutes a foundation for discussion about how competence is both understood and how it can be used in the development of educational programmes.

Definition: *Competence* is the ability to integrate and apply contextually-appropriate knowledge, skills and psychosocial factors (e.g., beliefs, attitudes, values and motivations) to consistently perform successfully within a specified domain.

Key terms (in alphabetical order)

We have provided a short definition for each of the key terms in the main definition of competence. These descriptions have been derived from a combination of sources, including information from papers cited within the reference list, as well as our own and colleagues' understanding of these terms. They are intentionally simple; we have provided them to help readers understand the key aspects of competence.

- *Attitudes* are coherent patterns of tendencies about something or someone that shapes behaviour.
- *Beliefs* are assertions that an individual accepts as true, and holds with confidence and conviction.

- *Consistently* highlights that competence is an ongoing demonstration of competent performance. Competence is an inference made from the observation of competent performance. Consistency goes beyond the replication of performance in exactly the same situation. It is about adaptability to any relevantly similar situation within a specified domain.
- *Context* sets the conditions for competence to be demonstrated. Context refers to the situations, tasks and settings in which the competence is used.
- *Contextually appropriate* emphasises that competence is not merely an attribute of the individual; it cannot be separated from context. Contextually appropriate recognises the interaction between the individual and the conditions of the context in the demonstration of competent performance.
- *Domain* refers to the broad area of study, thought or activity that the competence is part of. This can be, for example, a broad area of knowledge, academic discipline, occupation or social life.
- *Knowledge* refers to the body of information about a particular field of study or work, which is comprised of facts, concepts, practices and theories.
- *Motivations* initiate, guide, and maintain goal-oriented behaviours.
- *Skills* refers to actions (e.g., physical, cognitive), which involve applying knowledge that may be tacit or explicit.
- *Values* refer to an individual's evaluation of the guiding importance, worth or usefulness of something or someone.

Principles underpinning the definition

The following principles draw attention to fundamental features of the concept of competence, some of which have been made explicit in the definition above. Under the heading of each principle, we indicate which key terms from the definition are primarily related to that principle.

Principle 1: Competence is linked to a domain and dependent on context.

(Definition key terms: domain, context, contextually-appropriate)

‘Domain’ and ‘context’ are closely related words but they have different implications for theorising about competence and applying it to educational practice.

‘Domain’⁵ refers to the field of study, occupation or interest in which the competence is part of. We learn to be competent (or to develop competence) in a specified area of content and/or activity, and, similarly, we teach, assess, judge or make inferences about other people’s competence with regard to a specified area. In vocational education, domain often refers to a particular occupation (e.g., doctor) while in general education, it may refer to an academic subject (e.g., mathematics) or an area of content such as problem solving or collaboration, and more widely it may refer to broad interests such as personal finances. Domains can vary in terms of how broad they are (e.g., mathematics vs statistical mathematics). With regard to competence, broad areas of content that cross over multiple fields of academic study are not always called ‘domains’, as this term is reserved for occupations or subjects of interest. Within debates between domain-specific or domain-general competence, ‘domain’ is typically used to refer to the occupation or subject of interest, and the competence concerns a broad content area that cuts across these domains (e.g., digital competence or learning to learn).

In contrast to the domain, ‘context’ refers to the settings, situations and conditions that surround any demonstration of competence. Context is crucial for competence to be observable (and potentially measured) as competence cannot be observed outside of a context (Hager & Gonczi, 1996). Competent performances are situated in particular times and places, and under particular psychological and social conditions. It is important that the context is thought of in terms of both the features of the task or activity itself as well as the surrounding circumstances in which it is performed, which includes any communities of practice (Lave & Wenger, 1991; Wake, 2014). The fundamental role of context in competence demonstrations means that there needs to be careful consideration of the degree of context specificity that attaches to the competent performance. This raises important questions about whether learning and the demonstrated competence transfer beyond the context in which they occurred. This links with work on apprenticeship environments where the learning is tailored to organisational rather than to professional

⁵ Note, the term ‘domain’ has other meanings in other contexts. For example, in educational assessment, domain refers to a sample of content area used tested by the assessment.

need (Fuller & Unwin, 2003). Examples of context include assessments of English language that are specifically for international workplaces⁶, and courses called “Mathematics for Scientists”⁷ which are about teaching the domain of mathematics within the context of Sciences.

Principle 2: Competence is a holistic concept.

(Definition key terms: integrate, contextually-appropriate)

A holistic approach is adopted in a number of high profile competence models (European Commission Education and Culture, 2007; OECD, 2017; Rychen & Salganik, 2003), and this is reflected in our definition of competence. Competence is viewed as part of a complex system; it encompasses the individual’s internal factors (e.g., knowledge, skills, attitudes, values) as well as the contextual factors that underpin the competent performances. See Principles 4 and 5 for a discussion of the internal factors underlying competence, and Principles 1 and 3 for further discussion of context. This holistic view highlights three interconnected aspects of competence: the person, the context and the action. Performance (action) is a central aspect of this system, which aligns with the category of models known as ‘action competence’ (Weinert, 2001). Considering performance helps to anchor considerations of the other aspects of the competence system. This ensures, in particular, that conceptualisations of competence are functionally relevant (Rychen & Salganik, 2003), which has clear implications for educational practice, including assessment.

One value of taking a holistic approach is that it focuses attention on the interconnectedness of the different factors involved in competence. This implies that competence may not be achieved if there is inadequacy in any of those aspects. If this is the case, then the necessary context-appropriate factors may not be appropriately mobilised and integrated when required, which may preclude competent performance. Accordingly, taking a holistic view signals that competence should always take into account the discrete contributions of each part of the system as well as how they interact with each other. This has important value for designing teaching and learning programmes to develop competence (Hager & Goncz, 1996). For example, Carrier (2015) devised an approach to start developing students’ competence in conducting historical research in the first year of secondary school. The first scheme of work that she trialled was structured around key research processes (known as the enquiry structure within history education). Lesson 1 was about choosing a research topic, lessons 2 and 3 were about using secondary and primary evidence to test the hypothesis, respectively, and so on. However, Carrier described various difficulties she encountered when implementing this set of lessons with her students. For instance, she describes how some students found it difficult to identify a broad variety of sources for their research topic. She attributed this to a lack of subject specific knowledge about historical causations which she argued had prevented students from being able to engage with the sources appropriately.

⁶ <https://www.cambridgeenglish.org/exams-and-tests/qualifications/business/>

⁷ <https://www.cambridge.org/highereducation/books/essential-mathematics-for-engineers-and-scientists/360060D2275A26DEEE5DE001624FD623#overview>

Principle 3: Competence is about consistent performance across contexts within a domain, which supports predictions of future performances.

(Definition key terms: consistently, contextually-appropriate, domain, perform successfully)

Consistency of performance within a domain (broad or narrow), is integral to the concept of competence. Competence is not only about being able to perform successfully within a specified domain but it is about being able to perform *consistently* successfully. Consistency is an explicit feature of descriptions of competence within various qualifications and competence based frameworks. For example, Australia's Department of Education, Employment and Workplace Relations state: "Competency requires the ability to apply relevant skills, knowledge and attitudes consistently over time, and in the required workplace situations and environments" (DEEWR, 2007, p.246). Consistency is more than just mere replication; it is about performing competently across different contexts since it is unlikely that in real-world settings learners will encounter exactly the same situation (Oates, 2003). Indeed, dealing with new and unfamiliar contexts, in particular, is an important part of being competent. This is the focus of the OECD conceptualisation of competence which emphasises that competence enables people to meet complex challenges (OECD, 2017). Oates (2003) emphasises that it is adaptability that underpins effective performance across contexts rather than mere transferability of knowledge and skills (and psychosocial factors): "Every new situation involves changes or adaptation of our existing skills and constructs" (p. 178).

Consistency of performance (underpinned by adaptability) is the feature of competence that supports predictions of future performance. Knowing someone is competent enables us to predict their likely performance in relevant contexts. This is fundamental for anyone with an interest in someone's competence. Thus, it can be useful to think of competence from a claims-making perspective; competence makes a claim about what someone will be able to do in a particular context. Someone's competence can only be verified when they undertake a competence-based task or activity. Viewing competence from the perspective of claims-making should ensure that the claims that derive from the concept of competence are given careful consideration to ensure that sufficient and high-quality evidence is gathered during learning and assessment processes to evaluate and validate the claims from competence.

Principle 4: Competence involves applying contextually-appropriate knowledge and skills.

(Definition key terms: integrate, apply, knowledge, skills, contextually-appropriate, perform successfully)

It is increasingly emphasised that competence involves the use of both knowledge and skills (Hager & Gonczi, 1996; Mulder, 2012; Rychen & Salganik, 2001). Competence specifically involves being able to identify and apply the knowledge and skills that are appropriate to the context in which the competence is used. The context may require knowledge and skills from the domain of the competence (e.g., plumbing) as well as from other domains or content areas (e.g., mathematics). What is contextually appropriate may be determined by a

community of practice, which may be professional, vocational, scholarly or lay (Lave, 1988; Lave & Wenger, 1991; Wake, 2014; Wenger, 1999; Wiliam, 1998), and this may change over time. Within each area of content, there are many types of knowledge and skills that might be needed. For example, Suto et al. (2020) recently synthesised a set of taxonomies of knowledge/skills that were originally written for school subjects as well as the workplace. This synthesis highlighted four different domains of knowledge/skills (information/declarative knowledge; mental procedures; psychomotor procedures; and interpersonal knowledge/skills), which were found to be part of applied qualifications and curricula. The critical aspect of knowledge and skills in competence is that it is applied, integrated and adapted to meet the needs of the context (Oates, 2003).

Skills have often taken the foreground in discussions, assessments and frameworks of competence (Brockmann et al., 2008; Priestley & Sinnema, 2014). One possible reason is that competence is, at its core, about what people can do, which naturally draws attention to the skills needed for the competent performance. However, the concept of 'skills' is different from the concept of 'competence': 'skills' are only one aspect of competence. As our definition highlights, competence is about consistent performance in a domain which involves integrating the appropriate skills in combination with the appropriate knowledge and other psychological factors necessary for the context. Others have made similar attempts to distinguish the two terms explicitly: "*The term 'competence' (a holistic concept) designates a complex action system encompassing knowledge, cognitive skills, attitudes and other non-cognitive components, while the term 'skill' is used to designate an ability to perform motor and/or cognitive acts.*" (Rychen, 2004, p.321).

Our definition of competence intentionally places "knowledge" before "skills" for two reasons: (1) to emphasise the importance of knowledge in competence and (2) because skills are underpinned by knowledge (tacit and explicit). Having comprehensive knowledge in an area is acknowledged as being an essential element of competence in any area (P21, 2009; Puyana & Edwards, 2016). Knowledge is also a resource for use in the development of skills (Brockmann et al., 2008). Abstracted knowledge that enables students to think beyond everyday experience, such as disciplinary knowledge, is considered by some to be "powerful knowledge" (Young et al., 2014), and this forms an element of highly competent performance. As the interaction and integration of knowledge and skills is a fundamental aspect of competence, it suggests that developing competence can be facilitated by opportunities to integrate knowledge and skills. Learning through experience, where theory and practice are combined, is one approach that can facilitate this (Brockmann et al., 2008).

Principle 5: Competence involves psychosocial factors, which affect performance and influence learning.

(Definition key terms: integrate, apply, psychosocial factors, contextually-appropriate, perform successfully)

Psychosocial factors also have an important role in the concept of competence. This phrase is used as an umbrella term to refer to any psychological or psychosocial factors beyond knowledge and skills that are involved in competence. These include beliefs, attitudes, values and motivations. They may also include concepts referred to by some as personality

traits such as behavioural, emotional or thinking tendencies. Various definitions of competence across the educational landscape include examples of psychosocial factors, including in general education (Morgan, 2019; OECD, 2018), vocational or professional education (Mulder & Gulikers, 2011), and language learning (Council of Europe, 2001; Deardorff, 2006). Some approaches draw attention to certain psychosocial factors. For example, Columbian education intends to develop specific values as part of competence, including efficiency, productivity, happiness, unity, equilibrium, and justice (Sancho Larrañaga, 2015). Governments sometimes incorporate particular values in (competence) in the curriculum to shape the country's citizens and culture (Morgan, 2019). Organisations (such as the Hong Kong police) include particular values in their definition of competence in order to drive professional practice in a particular direction (Chiu Kai-ting, 2002).

Domain-specific psychosocial factors are often part of the construct of competence, alongside knowledge and skills. For instance, for a construction worker, part of being competent is possessing the attitude of working safely and automatically wearing a helmet (Baartman & de Bruijn, 2011). Other psychosocial factors can affect competent performance in more general ways. For example, according to expectancy-value theory, learners' perceived values about tasks (whether a learner sees the task as useful/interesting and therefore engages in attempting it) and beliefs (about their level of competence in a domain) are inter-related with their motivation to undertake tasks and to demonstrate competence (Wigfield & Cambria, 2010). Empirical evidence of an association between psychosocial factors and performance have been found in various areas such as English writing competence (Bai et al., 2021), teacher competence (Yuan et al., 2017), and social work (Baartman & Ruijs, 2011).

Psychosocial factors can also influence learning and the development of competence. The values held by individuals and society can influence learning by affecting motivation to work towards a particular competence (i.e. it will guide courses of action based on desired goals; OECD (2017)). Learners' motivation, beliefs, values and attitudes can influence participation in educational courses, persistence and choice (Fernández-Agüero & Hidalgo-McCabe, 2020; MacIntyre & Blackie, 2012; Wigfield & Cambria, 2010).

Psychosocial factors can have different roles and influences at different stages of learning and levels of competence. One reason is that these factors support learning of competence but are also developed during the learning process. As an example we can compare four types of learning that have been identified for vocational/professional courses: low-road integration, assimilation/enrichment, accommodation, expansive learning (Baartman & de Bruijn, 2011; Billett, 2001; Illeris, 2004). These types of learning can occur at the beginning, middle or end of a course or career, and do not necessarily tally with different levels of competence.

- *Low road integration.* Essential knowledge and skills develop in an integrated manner with essential professional attitudes (e.g. working safely, punctuality). These aspects develop through practice until they automatically come to mind and guide individual's actions (Baartman & de Bruijn, 2011).

- *Assimilation/enrichment.* Automated knowledge, skills and attitudes are insufficient to do the job when someone is faced with a new situation. The person must consciously reflect to determine how to do the job (Schön, 1984). Reflection occurs when people have the time, cognitive resource and motivation to do so (Krosnick et al., 2005). Motivation is triggered by the positive outcomes of an action or the problems of an error. During practice and reflection new knowledge, skills and attitudes are developed (Billett, 2001), and connected to existing and non-conflicting mental models.
- *Accommodation.* There are occasions when new information conflicts with the existing and mental models and therefore cannot be connected assimilated (Illeris, 2004). The new information requires that existing mental models are disassembled to fit with the new information (Illeris, 2004). Often this occurs when a new technology or regulations are used. People must be motivated for revision to occur.
- *Expansive learning.* Learners have dramatic experiences which lead to restructuring in cognitive, social and emotional dimensions (Illeris, 2004). In other words, the developing competence involves a process of identity formation (Colley et al., 2003; Lave & Wenger, 1991). Working and or learning involves participating in learning, vocational and professional cultures. Each of these cultures has particular ways of feeling and acting, values, attitudes, beliefs, norms and so on. Whilst participating, a learner chooses whether to orientate themselves to these aspects of culture and, thus, whether to continue with the profession/vocation. The changes only occur when learners are motivated. This is a transformation of identity and emotions as well as knowledge and skills. Learners join and sense they belong to a community of practice.

Principle 6: Competence is connected to a specified level of learning or ability.

(Definition key terms: perform successfully)

Competence is inherently connected to a level of learning or ability, which is associated both with the standard of a competent person's performance and the demands of the competence activity. Many approaches to competence focus on the level of performance that is expected of a competent person. Traditionally within vocational education and training, competence has been viewed as a binary concept in which learners are either competent or not (yet) competent at a specified level of performance. This is the purpose of licence-to-practice qualifications, which certify that learners are competent to practise in an occupational domain. In binary frameworks, competence is typically connected to a minimally viable or pass/fail standard of performance, as is the case for licence-to-practice qualifications. However, neither a binary line nor a minimum standard are inherent properties of our definition of competence. Competence can also be viewed with regard to a continuum of learning (or proficiency) (Child & Shaw, 2020; Letina, 2020; Newton, 2018), which has important implications for teaching, learning and assessment, in the all education sectors and beyond. A competence continuum can contain a competent/non-competent boundary, as well as levels of learning towards and beyond that initial level of competence. Because of the differing interpretations of the word 'competence' with regard to level, it is important to make explicit what the level of competence is. For example, the word 'competence' could be

preceded by an appropriate adjective (e.g. *minimally* competent, *highly* competent); it could be linked to a particular level (e.g., competent at level 1, competent at level 2); or the domain could be described in terms of demand level (e.g., competent at car driving vs competent at *advanced* car driving). The precise conceptualisation of the continuum should be constructed in a way that is functionally relevant for learners and stakeholders (e.g., employers) (see Newton, 2018 for a range of examples and detailed discussion).

In contrast to focusing on performance level, some models of competence focus on the level of demand of a task, although sometimes implicitly. For example, various high profile discussions of competence focus on complexity, viewing competence as an ability to meet complex challenges (OECD, 2017; World Economic Forum, 2015). This implies that someone with competence (in a particular area) should be able to accomplish a task that is highly demanding. However, competence can also be meaningful with regard to low demanding contexts. Learners may be competent at performing tasks of a low level of demand but not competent at more complex tasks. In certain domains it may be useful to define progression of competence with regard to the demand of the activities. The National Vocational Qualifications (NVQs) in England are workplace qualifications which certify different levels of competence, whereby the levels relate to the nature of the activities (Department for Business Innovation & Skills, 2016).

Conclusion

This report presents a unified interpretation of competence to support the design, development and delivery of assessment, curricula, and teaching and learning resources, which can be applied to a diverse range of educational contexts. Having a shared understanding of competence is vital for ensuring that educational programmes that aim to develop competence meet the needs of individuals, society and the labour market, nationally and internationally. We acknowledge that the principles presented in this report need to be subject to review and revision to ensure that they continue to take into account the latest research and thinking on competence, and take advantage of technological advancements to enhance our capability to support learners in competence development and assessment.

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