FACULTY OF EDUCATION
DEPARTMENT OF PEDAGOGICAL CURRICULAR AND PROFESSIONAL STUDIES

NAVIGATING INTERCULTURAL COMPETENCE DEVELOPMENT THROUGH CHALLENGE-BASED LEARNING

A SYSTEMATIC LITERATURE REVIEW

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Master's thesis:	30 credits
Programme/course:	S2ESD ESD700
Level:	Second cycle
Term/year:	Spring 2025
Supervisor:	Liisa Uusimäki
Examiner:	Jonas Emanuelsson

Abstract

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Keywords:	Challenge-based learning, intercultural competence, higher education

Aim: This study investigates the question how Challenge-Based Learning (CBL) in higher education is aligned with three different intercultural competence development models. The purpose of this thesis is to explore the relationship of CBL and intercultural competence development in higher education.

Theory: Elements and learning outcomes of CBL have been analysed for alignment with three different theoretical models of intercultural competence development: the Developmental Model of Intercultural Sensitivity by Bennett (1986), the Developmental Model of Intercultural Maturity by King and Baxter Magolda (2005), and the Process Model of Intercultural Competence (Deardorff, 2008). These models provide a multidimensional framework suitable for acquiring more insights in the different elements of intercultural competence development.

Method: A systematic literature was conducted, and 15 studies were selected after a thorough screening process. Data were analysed using a thematic analysis approach, following the approach of Clarke and Braun (2006). Themes and codes were mostly deductively applied, based on the theoretical models.

Results: This study shows that CBL may positively influence intercultural competence development in higher education. Limited alignment of CBL with the Developmental Model of Intercultural Sensitivity was found. While the Developmental Model of Intercultural Maturity proved to align better with CBL, the Process Model of Intercultural Competence aligned best with different learning outcomes of the educational approach. Additionally, the findings of this thesis contribute to research in higher education and intercultural competence development among students, especially for students following a CBL course or programme. It adds to the growing body of literature of CBL in higher education and showcases that CBL can contribute to intercultural competence development, even outside of intercultural contexts. To gain a deeper understanding of the effect of CBL on intercultural competence development, more longitudinal research is recommended.

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List of Abbreviations

CBL	Challenge-Based Learning
ESD	Education for Sustainable Development
PBL	Project-Based Learning
PrBL	Problem-Based Learning

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Introduction

Today, the world faces large global challenges that urgently need to be solved, such as the consequences of human-caused climate change like extreme weather events, flooding, global sea level rise, forest fires, displacement of people, etc. (IPCC 2023). These challenges all take place in an interconnected world, can be highly complex and can come with a certain degree of uncertainty (Madsen, 2013; González-Salamanca et al., 2020). An additional global challenge is the collaboration and interaction between people of diverse backgrounds. This challenge takes place in an increasingly interconnected, but also polarised world, where people have to cross cultural boundaries to reach effective communication, but do not always have the tools to do so (Arasaratnam-Smith & Deardorff, 2023; Paracka & Pynn, 2017).

Both for tackling real-life challenges in a globalized society and for personal development beyond education, the development of intercultural competences is "needed to function in an increasingly globalized and interconnected world" (Garret-Rucks & Jansa, 2020, p. 15). Herein lies a challenge to acquire the skills needed to communicate beyond cultural boundaries, to create mutual understanding (Fantini, 2009). There has been an increase of awareness in the last decades about the contribution of intercultural competence on interactions globally and locally (Bennett, 2009). Educational institutions play an important role in this, by preparing students for becoming responsible, global citizens (Gergersen-Hermans, 2017).

Education carries the responsibility for preparing current and new generations to be able to deal with these global complexities and can do so, for example, by teaching students 21st century skills, including collaboration, flexibility, creativity and critical thinking (Madsen, 2013; Paracka & Pynn, 2017), and by offering education that provide multidisciplinary perspectives and prepare students for dealing with complex and dynamic challenges (Madsen, 2013). Additionally, education plays a crucial role for increasing sustainable development (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2014) and to tackle these challenges. Education for Sustainable Development (ESD) prepares students for dealing with these global challenges by providing them with competences, knowledge and values that help them become responsible citizens, while emphasizing the importance of intercultural understanding (UNESCO, 2020; UNESCO, 2022). These knowledge and skills can be developed through education as well as through personal and real-life experiences that students

have (González-Salamanca et al., 2020). Acquiring these skills and knowledge empowers students to responsibly and actively participate in solving challenges while being able to acknowledge and critically evaluate different perspectives (González-Salamanca et al., 2020; Sandell et al., 2003/2005).

Experiential learning is an educational theory that aligns with this principle. It focuses on the educational value of knowledge development through the transformation of real-life experiences (Kolb, 1984; Kolb & Kolb, 2009; Yardley et al., 2012). Within experiential learning, learning and knowledge development is seen as an ongoing process where people observe and reflect on their experiences (Kolb, 1984). It allows learners to recognise challenges and to explore how they can tackle them, which they can use later in a professional setting, while applying their gained knowledge and learned skills (Yardley et al., 2012; Romero Caballero et al., 2024).

Challenge-based learning (CBL) is an educational approach in higher education that is aligned both with the principles of ESD and experiential learning (Dikilitaş et al., 2025; Félix-Herrán et al., 2019; Gallagher & Savage, 2020). It focuses on knowledge and skill development through tackling real-life challenges in teams (Gallagher & Savage, 2020; Romero Caballero et al., 2024). This educational approach allows for students to be immersed in knowledge, while collaborating in a multidisciplinary setting and developing the skills needed to solve present day challenges, which creates a valuable learning environment and equips students with competences that are valuable for their professional lives (Malmqvist et al., 2015; Romero Caballero et al., 2024).

To collaborate with culturally diverse peers, intercultural competence development is crucial for an efficient work environment (Méndez García & Péréz Cañando, 2011). According to Guillén-Yparrea and Ramírez-Montoya (2023), collaboration projects are beneficial for students to develop a more thorough understanding of the different cultures and perspectives that their peers might have. Their research shows that collaborative learning, together with language, virtuality and student attitudes, is crucial for “effective intercultural collaboration in academic environments” (p. 12). Moreover, collaborative learning with interaction with culturally diverse peers in an international higher education context seems to have a positive

effect on intercultural competence development (De Hei et al., 2020; Liang & Schartner, 2022). When students are interested in collaborating with others and when they regard the collaboration to be of good quality, this results in a positive attitude towards diversity (De Hei et al., 2020).

Since collaboration is one of the key aspects of CBL (Gallagher & Savage, 2020) as well as a crucial aspect in developing intercultural competences in an academic setting (De Hei et al., 2020; Guillén-Yparrea & Ramírez-Montoya, 2023; Liang & Schartner, 2022), one would expect that elements of CBL and learning outcomes of this educational framework are associated with intercultural competences among students. However, the exact role of CBL in intercultural competence development is not yet explored and an understanding of the relationship between CBL and intercultural competences among university students is needed. To provide further insights into this connection, this study explores the following research question:

How do the outcomes of CBL in higher education align with intercultural competence development models?

To investigate this question, this study first examines existing literature on CBL and intercultural competence, outlining a comprehensive overview of relevant themes and connections between the concepts of CBL and intercultural competence. In the following theoretical framework, different models of intercultural competence development are considered in creating a tangible framework for exploring the alignment to CBL. Specifically, the theoretical framework explores intercultural competence development through valuable developmental and adaptational models of intercultural competence that are insightful for this research. To answer the research question, this study employs a systematic literature review, synthesising knowledge from existing literature available through the database Web of Science. Relevant literature was identified by using search terms related to CBL and intercultural competence, focussing on publications about higher education. To analyse the data, a thematic analysis was conducted, using Braun and Clarke (2006) as a framework for the analysis.

Literature review

Education for Sustainable Development

Sustainable development can be described as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987, p 54). It differs from the concept of sustainability due to the focus on processes to achieve sustainability in environmental, societal and economical dimensions, while sustainability by itself can be understood as an objective (UNESCO, 2012).

It is crucial that education approaches sustainable development as a dynamic and evolving concept (UNESCO, 2012). This can be done through Education for Sustainable Development (ESD), which can be understood as "the foundation for the required transformation, providing everyone with the knowledge, skills, values and attitudes to become change agents for sustainable development" (UNESCO, 2022, p. 3). ESD promotes the development of both cognitive and non-cognitive skills, including "critical thinking and competences for collaboration, problem solving, coping with complexity and risk, building resilience, thinking systematically and creatively, and empowering them to take responsible action as citizens" (UNESCO, 2022, p. 3). Additionally, it fosters diversity and a respectful attitude toward different perspectives (Wals & Benavot, 2022). Moreover, the Berlin Declaration on Education for Sustainable Development emphasizes the importance of intercultural understanding in this setting (UNESCO, 2022).

However, ESD is not uncontested in the literature. To start, Washington argues that development in the Western world is often understood as economic and industrial growth, including sustainable development. This is why sustainability cannot be understood as sustainable development, as this implies further growth even though limits are already being exceeded (2015). Moreover, according to Kopnina (2020), ESD does thus not always take future perspectives of both humans and non-humans into consideration, often contradicting ecological considerations. Another concern to consider, is formulated by Jickling and Wals (2008), who argue that the global and development focus of ESD possibly excludes traditional and alternative forms of education and "ways of engaging people in existential questions about the way human beings and other species live on this Earth" (p. 18). Finally, perspectives other

than Western ones in ESD, are not always considered and the Western discourse is often dominant (Kopnina, 2020). Bengtsson (2024) argues that following one perspective in education, be it Western or another one, "can be seen as limiting how we engage with the world" (p.851).

Experiential learning

Knowledge is not enough on its own to facilitate the development of intercultural competence and the classroom is not the only place where developing intercultural competence takes place (Deardorff & Arasaratnam, 2017). Pedagogical interventions such as providing experiential activities, including authentic learning materials, and integrating interculturality on a long-term basis in education are proved to improve the development of intercultural competence (Zhang & Zhou, 2019). Engaging with real-life experiences is essential for this development to take place (Deardorff & Arasaratnam, 2017). This requires higher education institutions to include real-life experiences in their education, facilitating collaboration between different groups that can be found inside and outside the university environment (Deardorff & Arasaratnam, 2017).

Experiential learning can be seen as a way of constructing knowledge through experiencing real-life situations, by transforming these experiences into knowledge (Kolb, 1984; Yardley et al., 2012). Within experiential learning, the act of learning is understood as a process led by experience, where the outcomes of the learning process are informed by someone's past experiences. Consequently, new learning situations and experiences are met with already established ideas about the situation or concept (Kolb, 1984). Since learning happens through experiences, it can be seen as a continuous process which also happens outside of the classroom. By understanding this learning process from a holistic perspective there are links between experiences in someone's private life and during school, creating a lifelong learning process (Kolb, 1984).

Experiential learning is part of progressive education. According to Dewey (1963), this type of education is student centred, flexible and content driven. Student participation is a central concept, as the approach focuses on having students experience real-life situations which are then used for active learning (Dewey, 1963). These real-life experiences take place within "specific social, cultural and ecological contexts" (Luff, 2018, p. 448) and should fulfil certain

criteria in order to be an effective tool for learning (Dewey, 1963). Dewey formulated these criteria used for qualifying experiences as good opportunities for learning (1963). To achieve knowledge development, experiences need to be multidimensional and positive, but there also needs to be a certain continuity in educational experiences and an interaction with the social context for the experience to be of good quality and be appropriate for personal development (Dewey, 1963). Learning through experience can thus be seen as a social process (Luff, 2018).

However, there is still a large focus on individuality in experiential learning, as all people have individual experiences and learn differently based on their own perceptions and reflections on their experiences (Dewey, 1963; Yardley et al., 2012). This is why, in addition to the criteria formulated by Dewey, it is important that people are able to view experiences as different from each other and are able to identify the differences between experiences. The differentiation of experiences provides a space for knowledge development (Yardley et al., 2012).

According to Tarrant and Thiele (2016), ESD aligns well with experiential learning, specifically regarding educators facilitating experiences while empowering students to develop 21st century skills needed to navigate the complex challenges our society faces, such as critical thinking, effective communication, collaboration, and systems thinking (Tarrant and Thiele, 2016). Additionally, if educational institutions want to follow experiential learning, their educational approach should introduce knowledge in relation to real-life situations as well as in relation to the teaching in the educational institution (Andersen, 2002, as cited in Madsen, 2013).

For tackling real-life challenges and increasing one's learning power through experience, it is important that students go through a cycle of "experiencing, reflecting, thinking, and acting" (Kolb & Kolb, 2009, p. 297). This cycle of learning in the form of experiential learning aligns its pedagogy with CBL. According to the CBL framework, "CBL builds on the foundation of experiential learning" (Nichols et al., 2016, p. 6). However, it needs to be noted that there is no clear agreement in the literature from which theoretical pedagogy CBL originates exactly, even though CBL could be seen as a combination of active learning and experiential learning (Gallagher & Savage, 2020).

Challenge-based learning

CBL is frequently defined as "a learning experience where the learning takes places [*sic*] through the identification, analysis and design of a solution to a sociotechnical problem. It is typically multidisciplinary, takes place in an international context and aims to find a solution, which is environmentally, socially and economically sustainable" (Malmqvist et al., 2015, p. 1). However, there is no standard definition used for CBL (Gallagher & Savage, 2020; Van den Beemt et al., 2023).

CBL was first mentioned in academic literature in 2001 (Gallagher & Savage, 2020). One definition that is commonly used, was developed in collaboration with educators from the United States (Nichols & Cator, 2008). The educational concept was developed as part of the project Apple Classrooms of Tomorrow - Today, which focused on creating a learning environment suitable for the 21st century, preparing students for their professional lives and empowering them to make a difference (Nichols & Cator, 2008). In this publication, CBL was defined as "an engaging multidisciplinary approach to teaching and learning that encourages students to leverage the technology they use in their daily lives to solve real-world problems" (Nichols & Cator, 2008, p. 1). It is explained as a collaborative educational approach where students work on real-life challenges together with peers, teachers and stakeholders who are linked to the challenge (Nichols & Cator, 2008).

CBL coexists with other educational approaches that are often understood as being similar in set up because of their shared use of problems or challenges (Gallagher & Savage, 2020). These are project-based learning (PBL), and problem-based learning (PrBL). The differences between are outlined below.

In CBL, the issue that students work on stems from a real-life situation and is relevant from an economic, social and/or environmental perspective. The challenges are often open-ended, complex, and possibly undefined. Students are required to formulate an actionable real solution, such as a product or service that can be implemented (Garay-Rondero et al., 2019). In order to solve the challenge, students "analyze, design, develop and execute the best solution in order to tackle the challenge in a way they and other people see and measure" (Membrillo-Hernández et al., 2019, p. 1105). Students gain knowledge by transdisciplinary collaboration, facilitated

by the challenge that they are trying to solve. The learning process is more important than developing the solution in this case (Membrillo-Hernández et al., 2019). Meanwhile in PBL, students tackle a relevant issue with a predefined focus. They are required to define a real solution in a controlled situation (Garay-Rondero et al., 2019; Membrillo-Hernández et al., 2019). The outcome can often be compared with previously executed projects. By working on a specific project, students learn and can apply their knowledge to the project (Membrillo-Hernández et al., 2019). Finally, in PrBL, the problem that students try to solve is relevant for a certain subject and can be fictitious. Students are not required to formulate an actionable solution but use their solution to showcase their learning process (Garay-Rondero et al., 2019; Membrillo-Hernández et al., 2019). Students increase their knowledge through specific problems, which can then be used to find a solution for the problem they are working on (Membrillo-Hernández et al., 2019).

An additional important difference between the educational approaches is the community in which the learning takes place. In PBL, students are guided by their professors or teaching staff, as well as by related project managers who all take on a facilitating role, while in PrBL students are guided by their professors or teaching staff who facilitate and teach, while providing guidance and advice (Garay-Rondero et al., 2019; Membrillo-Hernández et al., 2019). However, in CBL, there are more actors involved that support the learning process of the students such as professors and teaching staff, stakeholders related to their challenge, and relevant content experts (Garay-Rondero et al., 2019). Additionally, the role of teachers is significantly different in CBL. Teachers take on multiple roles in CBL to provide support for students in different ways. They provide guidance in the roles of coach and co-researcher, and by helping them with formulating their solution in collaboration with their stakeholders (Membrillo-Hernández et al., 2019).

CBL thus can be seen as its own educational approach and has its own frameworks (Gallagher & Savage, 2020). One of these frameworks is the Challenge Based Learning framework which was developed following the Apple Inc publication (Nichols & Cator, 2008). This framework builds on twelve foundational concepts ranging from authentic learning outside of a classroom and freedom to fail to boundary setting and reflecting on the process (Nichols et al., 2016). The framework uses three phases in which projects are conducted: Engage, Investigate, Act. The

authors describe the framework as “collaborative and hands-on”, with a flexible approach to the different phases (Nichols et al., 2016, p. 6). During the first phase ‘Engage’, students identify their challenge from a large and complex issue. This phase allows them to get familiar with the topic and to find a challenge that is relevant for the group and actionable into a solution (Nichols et al., 2016). The second phase of ‘Investigate’ is for students to gain knowledge, answer their questions and find possible solutions for their challenge. They create their journey on how to develop the solution while fulfilling the academic requirements of the project (Nichols et al., 2016). During the final face ‘Act’ students develop their solution, disseminated and evaluated. Throughout the different phases, students document their process and reflect on their learning (Nichols et al., 2016).

Gallagher and Savage (2020) provide a conceptual framework of CBL based on academic literature about the educational approach. Their research shows that “global themes, real-world challenges, collaboration, technology, flexibility, multidisciplinary and discipline specificity, challenge definition, and creativity and innovation were the most common emerging themes from exploring CBL research definitions” (p. 1149).

Since 2008, CBL has increasingly been adopted in higher education (Leijon et al., 2021; Nichols et al., 2016). It is a suitable approach for students to develop transversal skills and to explore transdisciplinary collaboration. However, CBL is not yet often implemented in curricula. More often it is used within already existing frameworks, sometimes as part of a trial (Gallagher & Savage, 2020). However, CBL courses and programmes with positive results have a positive effect on the implementation of CBL in curricula and universities (Gallagher & Savage, 2020).

Another educational aspect worth mentioning, is the form of assessment used for CBL education. Gallagher and Savage (2020) found that a formative as well as summative assessment approach were used within different CBL settings. Students are often assessed both on an individual and on a team level and on different rubrics, such as communication, not only with each other, but also with external stakeholders (Gallagher & Savage, 2020).

Research on the benefits of CBL has mostly touched upon the benefits for students. Some benefits of participating in a CBL approach are developing an innovative approach and innovative competences, as well as "industry networking, improving technical skills, application of skills in a real-world environment, training in multidisciplinary teamwork, improving problem solving skills, and achieving a deeper understanding of knowledge (Gallagher & Savage, 2020, p. 1148). While there are several benefits to CBL as an educational approach, there are also challenges that come with it. To start, the implementation of CBL in education can come with complications. This is due to several reasons, including not finding support for a new educational approach or the use of technology in teaching, required flexibility for the organisation of CBL courses, and required student support for transitioning to a CBL way of working, introducing working in multidisciplinary teams, and other student support (Gallagher & Savage, 2020). Additionally, CBL comes with an increased workload for teachers, which is not always possible due to available capacity for example (Gallagher & Savage, 2020; Doulougeri et al., 2024). Other difficulties that can be encountered for the implementation of CBL are due to the challenging aspects of formulating a challenge (Doulougeri et al., 2024). These difficulties exist in conflicts with traditional approaches to education, time limitations and aligning the challenge to the formulated learning outcomes. Moreover, not all teachers had positive experiences in involving external stakeholders in the challenges. They experience difficulties in aligning expectations and interests between stakeholders and educational staff. However, including external stakeholders was a valuable experience for CBL students (Doulougeri et al., 2024).

Huesca et al. (2024) show that CBL is suitable for preparation of students of their professional lives, by providing real-life learning opportunities which are beneficial for the development of "interdisciplinary and transversal competences like critical thinking, self-directed learning, frustration tolerance, decision-making, and ethics, among others (Huesca et al., 2024, p. 19). Additionally, CBL allows students to develop their collaboration skills and to include different perspectives in their analysis and process, while learning how to communicate to diverse audiences (Huesca et al., 2024).

Intercultural competence

The concept of intercultural competence has been extensively researched for many years. Research on this topic started in the 1950s, focussing on cultural adaptation in different cultural contexts (Várhegyi & Nann, 2009). The origins of the term intercultural competence can be found in the 1970s and 1980s when the development and assessment of intercultural competence was further explored. From the 1990s onwards, conceptual models were developed to explore the measurement of intercultural competence further (Spitzberg & Changon, 2009). The available research on intercultural competence extends across several academic disciplines (Arasaratnam, 2016; Arasaratnam-Smith, 2017).

While there is extensive research available on intercultural competence, there is no central framework, theory or definition that is used to describe intercultural competence (Deardorff, 2006; Arasaratnam, 2016; Arasaratnam-Smith, 2017). The concept is often described in terms of personal abilities and contextual variables (Arasaratnam, 2016). According to Deardorff (2006), the following elements are common in definitions of intercultural competence: "awareness, valuing, understanding cultural differences; experiencing other cultures; and self-awareness of one's own culture" (p. 247). Additionally, for some researchers, individual aspects and a person's abilities plays a central role for intercultural competence, while other authors focus on the social aspects of intercultural competence (Arasaratnam, 2016).

Intercultural competence is closely related to cultural intelligence. Ang and van Dyne define cultural intelligence as "an individual's capability to function and manage effectively in culturally diverse settings" (Ang & Van Dyne, 2008, p. 3). They suggest that cultural intelligence can be understood as a type of intelligence that is complementary to emotional and general intelligence as it gives insight into how people navigate cultural diversity and adapt to new cultural situations (Ang & Van Dyne, 2008). Cultural intelligence, just as intercultural competence, evolves over time (Ang et al., 2011). The term is used in a large variety of disciplines, such as business, psychology, communication, human resources, sociology and education, to name a few (Ang et al., 2011). According to Li (2020), the two concepts of cultural intelligence and intercultural competence are "highly correlated" (p. 5) and both "seek to understand why certain individuals are arguably more effective in dealing with people from other cultures" (p. 2). However, according to Ang et al. (2015), cultural competences can be

seen as an umbrella term “for concepts related to intercultural effectiveness” (p. 432). This is in line with Leung et al. (2014), who classify cultural intelligence as a model of intercultural competence. Understanding the differences between intercultural competence and cultural intelligence helps with framing this study. Because intercultural competence offers a more holistic approach to understanding intercultural interactions as well as to the personal development aspect, this concept has a central place in this research.

A starting point to understand intercultural competence, is understanding the meaning of culture. While culture is a term that can be defined in many ways, the United Nations Educational, Scientific and Cultural Organization’s definition of culture provides a comprehensive definition that includes different aspects of culture. They define culture as “the set of distinctive spiritual, material, intellectual and emotional features of a society or a social group, that encompasses, not only art and literature, but lifestyles, ways of living together, value systems, traditions and beliefs” (UNESCO, 2001, p. 1). Culture is understood as a dynamic concept (Bennett, 2014), and Barrett and Borghetti (2025) argue that people use a variety of cultural resources that change over time, for example due to influences from different cultures and influence from others. Since someone’s cultural background informs unwritten rules and values and thus influences their behaviour, it is crucial to be familiar with one’s own cultural background in order to have respectful interactions with others (Hofstede, 2009). This is especially relevant in a global society, where intercultural encounters are inevitable (Ting-Toomey, 2009).

Intercultural situations can thus take place between two people who are influenced by different cultural perspectives. However, Barrett and Borghetti argue that awareness of intercultural differences of participants of the interaction is needed for a situation to be understood as intercultural (2025). This awareness creates the possibility to distinguish other interpersonal differences to the ones attributed due to different cultural backgrounds. How people understand cultures, including their own, is also dynamic and can change depending on the situation and how it is experienced. This intercultural awareness can happen consciously, for instance through the context of a situation like difference languages, but it can also take place unconsciously, for example due to stereotypes (Barrett & Borghetti, 2025). This also means

that people interacting can understand this situation differently according to how they perceive their differences (Barrett & Borghetti, 2025).

Another aspect that is important for understanding intercultural competence is identity. Someone's identity consists of elements of the cultural aspects that define culture (Bennett, 2014). Not only does someone's identity facilitate the understanding of one's own behaviour, but it also facilitates dialogue between people as well as an understanding of that of others and recognizing their culture as having multiple layers too (Bennett; 2014; Deardorff, 2009).

Vitello et al. (2021) define competence as "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" (p. 11). This definition is developed for an educational context. They understand competence as a holistic concept that is context specific and has a connection to a level of learning or someone's ability (Vitello et al., 2021). However, for an intercultural context, the definition should be different, according to Barrett and Borghetti (2025). They define competence in an intercultural context as "the ability to mobilise and apply psychological resources dynamically in order to respond appropriately, effectively and respectfully to the demands, challenges, and opportunities that arise within intercultural situations" (Barrett & Borghetti, 2025, p. 104).

Deardorff (2006) defines intercultural competence as "the ability to communicate effectively and appropriately in intercultural situations based on one's intercultural knowledge, skills, and attitudes" (pp. 247-248). Barrett and Borghetti (2025) expand this definition by including other forms of understanding intercultural situations, such as understanding of texts, media and art from different cultures, the importance of understanding one's own cultural background, and the willingness to "promote and defend people's dignity and rights" when facing threats due to personal differences (Barrett & Borghetti, 2025, p. 95). Additionally, they emphasize the importance of respect in a definition of intercultural competence (Barrett & Borghetti, 2025). Some theoretical models also include the notions of respect (Deardorff, 2008) and willingness to stand up for other's rights (King & Baxter Magolda, 2005), as shown in the theoretical framework of this thesis.

Additionally, Deardorff (2009) indicates that intercultural competence is interaction between individuals who "represent different or divergent affective, cognitive and behavioral orientations in the world" (p. 6). These orientations are also recognized by Bennett (2014) as important aspects for intercultural competence development. First, affective competences, where curiosity can be seen as the key competence in this group (Bennett, 2014; Deardorff, 2006). Curiosity can be described as a sense of wonder, which is "the state of mind that signals we have reached the limits of our present understanding, and that things may be different from how they look" (Opdal, 2001, p. 33). By being curious, one realises that in intercultural interactions, things are often different than initially thought. This can provide insight into different perceptions and show that what we are used to is not always the only and correct way. In combination with an open mind, curiosity can make a difference in developing intercultural competences (Bennett, 2009). When someone is aware of their own biases in relation to those from different cultural backgrounds, is willing to step outside their own comfort zone and allow themselves to be curious, they will be able to see the different aspects and layers of someone else's culture more clearly (Arasaratnam-Smith, 2017; Deardorff, 2009).

The second category is cognitive competences, of which cultural self-awareness can be seen as the most essential competence in this category. Cultural self-awareness is the "recognition of the cultural patterns that have influenced our identities and that are reflected in the various culture groups to which we belong, always acknowledging the dynamic nature of both culture and identity" (Bennett, 2014, p. 159). The self-realization that someone's own identity is impacted by more than one culture, provides the opportunity to see that this is the case for other people too. In other words, being able to go beyond the surface of one's identity is crucial in developing intercultural competence (Deardorff, 2009).

Finally, Bennett (2014) notes behavioural competences as the last category of competences. Within behavioural competences, empathy is the most important one. Empathy can be seen as "an attempt to understand another person by imagining the individual's perspective" (Bennett, 2014, p. 160). While it is beneficial for understanding someone else's behaviour, empathy is not an easy competence to develop (Bennett, 2014; Calloway-Thomas et al., 2017).

Overall, it is important to use a holistic approach to defining intercultural competence since someone's competence level is not solely based on individual skills and perceptions but is in addition influenced by the perceptions and skills of others (Arasaratnam-Smith, 2017). Intercultural competence should be understood beyond communication and interaction between culturally diverse people but include the attitudes and judgement towards culturally diverse others in intercultural situations without interaction (Barrett & Borghetti, 2025).

Intercultural competence in higher education

Interculturality in education is not only something of recent years. In fact, according to Piaget, the first efforts towards intercultural competence in education were already made in the 1600s by philosopher Comenius. Comenius argued that diverse perspectives were crucial in gaining knowledge and for interaction between people (Piaget, 1957, as cited by Cushner & Mahon, 2009).

As mentioned above, the global challenges of today require students to develop certain skills that support them in developing global citizenship. One of the skills that graduates should possess is intercultural competence or the ability to collaborate with people from different cultural backgrounds (Cushner & Mahon, 2009; Liang & Schartner, 2022; Murray-García & Tervalon, 2017; Paige & Goode, 2009; Ting-Toomey, 2009). Collaboration with culturally diverse peers can be seen as "a collective, cooperative, collaborative and social learning experience" (Del Carmen Méndez García & Pérez Cañado, 2011, p. 146). This form of experiential learning influences the learning process of participants on a group level as well as on an individual one, positively influencing the opportunity for intercultural competence development (Del Carmen Méndez García & Pérez Cañado, 2011).

According to Del Carmen Méndez García and Pérez Cañado (2011), collaboration in culturally diverse teams can positively influence the development of global citizens, by improving cultural knowledge acquisition and providing the opportunity to learn from inspiring real-life experiences. It contributes to both personal growth and intercultural development (Del Carmen Méndez García & Pérez Cañado, 2011). This has led to the awareness in higher education institutions that they should play a role in preparing students to be responsible citizens who can collaborate with culturally different people (Gergersen-Hermans, 2017). According to Paige

and Goode (2009), intercultural learning opportunities have already been provided in secondary and tertiary educational institutions across different countries.

The level of willingness to include and understand different perspectives and the willingness to interact and collaborate with culturally diverse peers is crucial for intercultural collaboration (Guillén-Yparrea & Ramírez-Montoya, 2023). Students have the responsibility for their own cultural competence development, together with the higher education institutions where they study (Guillén-Yparrea & Ramírez-Montoya, 2023). The overall attitude of students aids their learning process in intercultural competence (Arasaratnam, 2016; Guillén-Yparrea & Ramírez-Montoya, 2023). Consequently, a positive or negative attitude can make a considerable difference for the outcome of this learning process (Arasaratnam, 2016). Having a positive attitude includes qualities such as curiosity and being open minded. These enhance interactions with others, inside and outside of someone's own culture (Guillén-Yparrea & Ramírez-Montoya, 2023). Experience with intercultural collaboration can also enhance empathy and open-mindedness (Liang & Schartner, 2022). However, possessing a negative attitude towards other cultures, including stereotypes and ethnocentrism that sees their own culture as the standard, can hinder the development of intercultural competence (Arasaratnam, 2016).

While collaboration across cultural boundaries can have positive effects on the development of intercultural competence, it can also cause complications and challenges, such as communication barriers and misunderstandings as well as feelings of exclusion, causing anxiety. According to Arasaratnam-Smith & Deardorff (2023), conflict is inevitable in intercultural situations and experiencing discomfort can facilitate possibilities for growth and learning. Therefore, these complications and challenges can also be seen as a valuable learning moment for the students involved (Liang & Schartner, 2022), as long as there is support available to overcome the conflicts (Arasaratnam-Smith & Deardorff, 2023).

Negative attitudes are hard to change, which is why institutional preparation before intercultural interactions in education is important for students. Students should be prepared by their institutions before having interactions in multicultural settings, to support their collaboration (Guillén-Yparrea & Ramírez-Montoya, 2023). This preparation is meant for them to develop a certain level of "awareness, communication, sensitivity, and intercultural responsibility", which

can encourage collaboration and make it into an experience that is positive and enriching for all participants (Guillén-Yparrea & Ramírez-Montoya, 2023, p. 10).

Teachers have an important role in preparing students for collaborative learning in a culturally diverse setting. By specifying the instructions for the group work and by highlighting and guiding the collaboration between group members, they can empower students to develop their intercultural competences while contributing to an overall pleasant collaboration (De Hei et al., 2020; Liang & Schartner, 2022). Additionally, facilitating intercultural competence development should be facilitated intentionally in order to provide an effective learning environment (Liang & Schartner, 2022). Teachers should thus be aware of the opportunities intercultural collaboration has to offer (De Hei et al., 2020; Liang & Schartner, 2022). However, this requires teacher training, which is not always feasible due to time constraints and other capacity related issues (De Hei et al., 2020; Liang & Schartner, 2022).

Theoretical Framework

Intercultural competences

Intercultural competence takes time to develop and requires continuous improvement (Deardorff, 2006; Fantini, 2009). Developing intercultural competence does not start when someone meets another person from a different cultural background (Taylor, 1994). Instead, previous life experiences already inform someone's competence levels, creating "a context of learning readiness" for when someone encounters another culture (Taylor, 1994, p. 161). It is a dynamic learning process in which intercultural competence continuously develops through people's lives, by learning new information in different intercultural situations (Deardorff & Arasaratnam-Smith, 2017). This process includes "change in values, an increase in self-confidence, and a change in perspective" (Taylor, 1994, p. 172) and is not always linear (Fantini, 2009). In other words, "over time, experiences, and deliberate reflection, people can learn things that cumulatively contribute to intercultural competence" (Arasaratnam, 2016, p. 8).

Spitzberg and Changnon outline different types of conceptual models used to describe intercultural competence development: compositional, co-orientational, developmental, adaptational, and causal path models (2009). While other models are interesting for their focus on defining intercultural competence and its components (compositional models), interactions and relations between components (co-orientational models) and the importance of adaptation in intercultural competence development (adaptational models), they respectively lack the element of interconnections between components, time and causality, and definition of adaptation needed for development (Spitzberg & Changnon, 2009). Considering that this research emphasises that intercultural competence is a dynamic process which happens over time, both causal and developmental models are of interest.

In developmental models, the development of intercultural competence over time is a central aspect with the argument that "relationships are capable of becoming more competent through ongoing interaction that produces greater co-orientation, learning, and incorporation of respective cultural perspectives" (Spitzberg & Changnon, 2009, p. 21). These models include different stages of development of intercultural competence and leave room for interactions to evolve (Spitzberg & Changnon, 2009). This is especially interesting from an educational point of view, as it provides the opportunity for students to learn how to interact with each other in an intercultural setting. However, they lack the identification of specific skills that influence this development as well as the causal relation between these skills and intercultural competence development (Spitzberg & Changnon, 2009). Two relevant developmental models are outlined below.

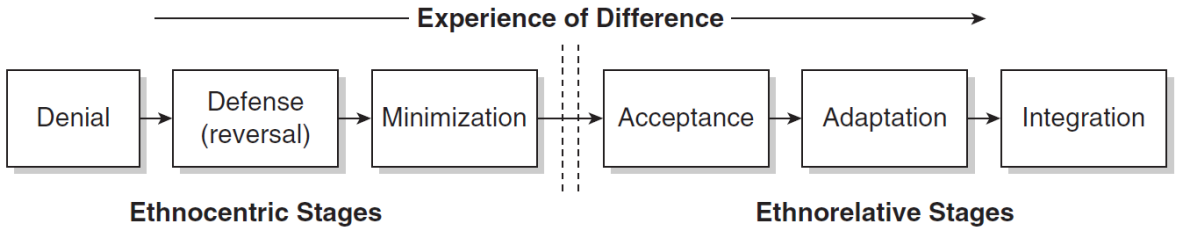
The Developmental Model of Intercultural Sensitivity (Figure 1) by Bennett (1986) describes the development of intercultural sensitivity through six stages, moving from ethnocentrism, where a monocultural worldview is the standard, into ethnorelativism, where one has developed towards a more complex and multicultural worldview (Spitzberg & Changnon, 2009). According to Bennett (1986), developmental models focus on the necessary process of internalization of concepts in order for development of competences to take place. The central concept in this developmental model focusing on intercultural sensitivity is difference, specifically between cultures. The aim of this model is to "illustrate "improvement" in the ability to comprehend and experience difference, and it should imply the strategies that will

impede such experience" (Bennett, 1986, p. 181). This process starts with the first stage of "denial", in which someone believes that their own culture and its values is the only relevant one. They deny the cultural differences they encounter (Bennett, 1886). Encountering different cultures challenges this view (Spitzberg & Changnon, 2009). In the second stage of "defense", someone does acknowledge other cultures but sees them as a "threat to the centrality of one's world view" (Bennett, 1986, p. 183). During this stage, someone will highlight the undesirable aspects of another culture, in a form of negative stereotyping. This can also be outed as seeing their own culture as superior over the other. However, experiencing other cultures as threatening implies that someone is aware of more than one culture and their differences. This is a first indication that intercultural sensitivity develops (Bennett, 1986). The third stage, also the last stage of ethnocentrism, is "minimization". While someone recognizes and tolerates other cultures, they try to keep their own culture in a central position compared to others. Differences with other cultures are seen as irrelevant and minimized in importance by focusing on cultural similarities instead (Bennett, 1986; Spitzberg & Changnon, 2009). In the fourth stage, simultaneously the first stage of ethnorelativism, one moves towards the stage of "acceptance", where cultural differences are "both acknowledged and respected" (Bennett, 1986, p. 184). The process of this stage includes two sub-stages. Someone will first accept differences in behaviour, followed by acceptance of different values. The acceptance that there are differences between cultures cannot exist without moving from an ethnocentric to ethnorelative point of view (Bennett, 1986). "Adaptation" is the fifth stage, where someone can alter their own process as a result of accepting the cultural differences. In this stage, someone is already able to follow ethnorelativism in their interactions and to go outside of their own cultural comfort zone (Bennett, 1986). Both empathy and cultural pluralism are important during this stage. Empathy can be understood in this context as "a temporary shift in frame of reference such that one construes events "as if" one were the other person" (Bennett, 1986, p. 185). This allows someone to change their behaviour and behave appropriately according to a different cultural frame (Bennett, 1986). Cultural pluralism is understood in the adaptation stage as the ability to "shift into two or more rather complete cultural world views" (Bennett, 1986, p. 185). The stage of adaptation is to behave in an ethnorelative way (Bennett, 1986). The final stage is "integration". This can be described as the "application of ethnorelativism to one's own identity" (Bennett, 1986, p. 186). In other words, someone is able to integrate their own and different cultural worldviews into their own identity, being able to identify aspects of different

cultural frames of reference without a value judgement attached to it (Bennett, 1986; Spitzberg & Changnon, 2009).

Figure 1

Developmental Model of Intercultural Sensitivity



Note. Developmental Model of Intercultural Sensitivity. From *The SAGE Handbook of Intercultural Competence* (p. 23), by B.H. Spitzberg & G. Changnon, in D.K. Deardorff (Eds.), 2009, SAGE Publications. Copyright 2009 by SAGE Publications.

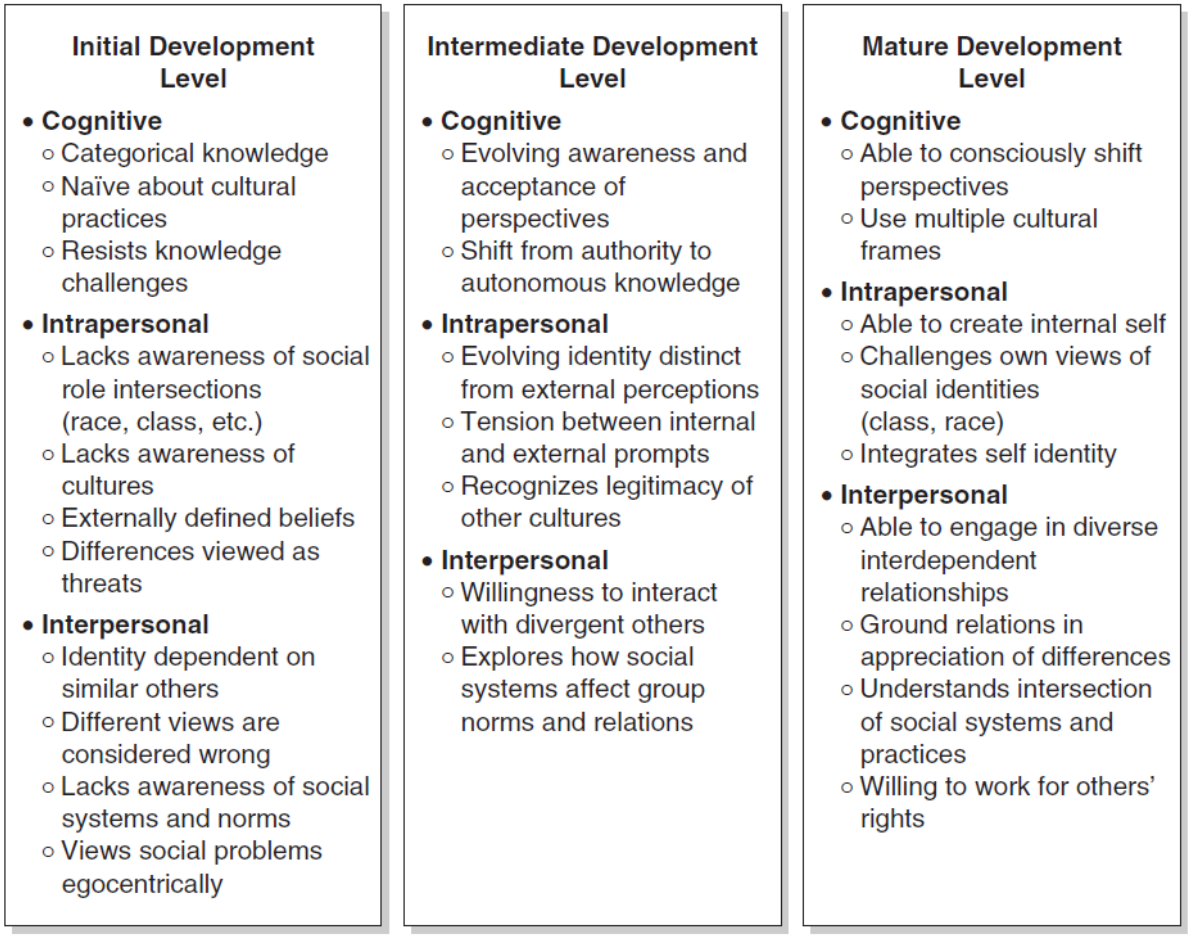
Another relevant developmental model for this research is the Developmental Model of Intercultural Maturity Model (Figure 2) from King and Baxter Magolda (2005). This model provides insight in the development of intercultural maturity and competence among students by integrating cognitive, intrapersonal and interpersonal competences (King & Baxter Magolda, 2005; Spitzberg & Changnon, 2009). Intercultural maturity can be defined as "multi-dimensional and consisting of a range of attributes, including understanding (the cognitive dimension), sensitivity to others (the interpersonal dimension), and a sense of oneself that enables one to listen to and learn from others (the intrapersonal dimension)" (King & Baxter Magolda, 2005, 574).

The model discusses different stages of intercultural maturity, which develops across cognitive, intrapersonal, and interpersonal dimensions, based on the model of lifespan development by Kegan (1994, as cited by King & Baxter Magolda, 2005). Specifically, King and Baxter Magolda (2005) apply Kegan's dimensions, which describe how intercultural maturity develops. In the Intercultural Maturity Model, the cognitive dimension refers to the ability of "complex understanding of cultural differences", the intrapersonal dimension refers to the ability to "not feel threatened by cultural differences", and the interpersonal dimension refers to the ability to "function interdependently with diverse others" (King & Baxter Magolda, 2005,

p. 574). When someone has achieved intercultural maturity, they have done so in all of these three dimensions (King & Baxter Magolda, 2005). Specifically, someone moves from an initial level of development of intercultural maturity to a mature level of development. Cognitively, this means that someone moves the initial development level of considering other cultural practices to be wrong and rejecting with knowledge that challenges their own beliefs, to being able to use and shift between different perspectives from various cultures in a mature development level (King & Baxter Magolda, 2005; Spitzberg & Changnon, 2009). From an intrapersonal perspective, someone starts at the initial development level with a lack of understanding of their own social identity and that of others, viewing cultural differences as a threat. At the mature development level, someone does not only have a clearer understanding of their own identity but is also able to challenge their own beliefs and to make well-informed decisions in intercultural interactions (King & Baxter Magolda, 2005; Spitzberg & Changnon, 2009). Finally, from the interpersonal dimension, someone's development starts at an individualistic point, having an egocentric look on social problem and different views and ends at the mature development level where someone can "construct and engage in relationships with others in ways that show respect for and understand of the other's perspectives and experiences, but that are also true to one's own beliefs and values" (King & Baxter Magolda, 2005, p. 579). According to Spitzberg & Changnon, one can progress between the levels by "study, observation, and interaction with representatives of another culture" (2009, p. 21). This progress happens gradually (King & Baxter Magolda, 2005).

Figure 2

Developmental Model of Intercultural Maturity



Note. Developmental Model of Intercultural Maturity. From *The SAGE Handbook of Intercultural Competence* (p. 22), by B.H. Spitzberg & G. Changnon, in D.K. Deardorff (Eds.) 2009, SAGE Publications. Copyright 2009 by SAGE Publications.

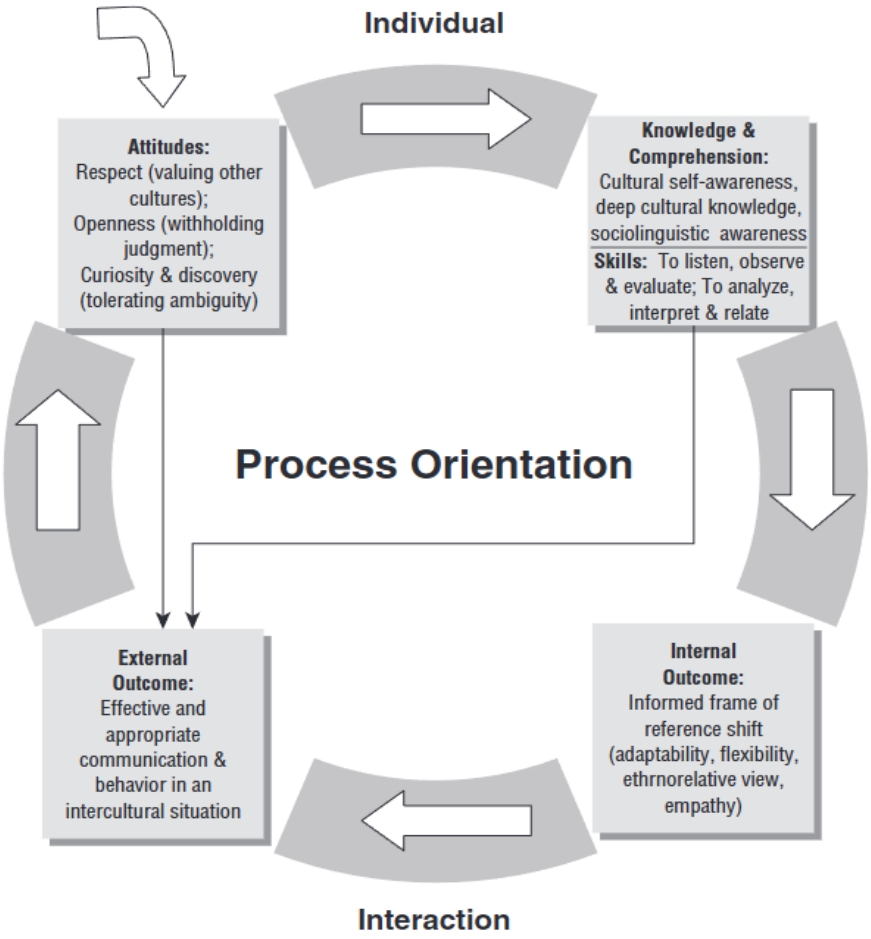
Compared to developmental models of intercultural development, causal path models do include the causal relation that developmental models are sometimes lacking and outline which skills and components are influencing intercultural competence development. They aim to showcase intercultural competence development in a linear way, including the causal relationship between components (Spitzberg & Changnon, 2009). The outlined causal relations provide the opportunity to test hypotheses, being a beneficial approach for research adaptation. However, the models often include feedback loops, which can complicate testing hypotheses when there are too many loops included (Spitzberg & Changnon, 2009). Below, one influential causal model is outlined.

The Process Model of Intercultural Competence (Figure 3) by Deardorff (2006, 2008) is "widely influential in international higher education" (Arasaratnam-Smith, 2017, p. 11). This is a causal path model that outlines attitudes, knowledge and skills that facilitate the development of intercultural competence (Spitzberg & Changnon, 2009). These attitudes, knowledge and skills develop from a personal level to an interpersonal level, preparing someone for interactions where one's internal outcome, such as increased adaptability and empathy influence the external outcome in interactions in the form of improved communication skills in intercultural settings (Deardorff, 2006; Spitzberg & Changnon, 2009). It is not needed to fully achieve the internal outcome in order to move toward the external outcome. One can move directly to the external outcome from attitudes or knowledge and comprehension, but this is not the most efficient learning process (Deardorff, 2006). The starting point of the Process Model of Intercultural Competence is Attitudes, as the attitudes respect, openness, and curiosity and discovery "will lead to both the conceptual shifts and the behavioural changes needed to increase intercultural competence" (Deardorff, 2008, p. 37). When someone develops these attitudes further, they simultaneously develop the ability to gain more cultural knowledge. Cultural knowledge includes cultural self-awareness and awareness of other cultures, shaping the perspective someone has on the world by creating a deeper understanding of other cultures and related values and behaviours, and their own (Deardorff, 2008). In addition to knowledge acquisition, developing skills is also important in intercultural competence development. Moreover, the development of both communication and cognitive skills, such as listening, observing, evaluating, analyzing, interpreting and relating, impact the development of awareness and cultural knowledge. Besides from the skills explicitly mentioned in the model, being able to reflect on the process of intercultural competence development is also a crucial skill (Deardorff, 2008). The next step in the model is a result of the combination of these skills, knowledge acquisition and someone's attitudes: desired internal outcomes. These desired internal outcomes can be seen as a shift in someone's frame of reference through adaptability between different cultures and flexibility in behaviour and worldviews, for which empathy towards cultural differences is crucial in understanding their perspective. This show of empathy "assumes a deep cultural knowledge" (Deardorff, 2008, p. 39). The process of intercultural competence development requires a mental shift, which, according to Deardorff (2008, p. 39), "manifests itself in the observable (and thus assessable) "external outcome" of effective and

appropriate communication and behavior in intercultural situations". In short, the Process Model of Intercultural Competence explains how someone's behaviour, communication and interactions in intercultural settings are influenced by their attitudes, knowledge, and skills (Deardorff, 2008). Since the model is structured as a cycle, it indicates the dynamic process that comes with developing intercultural competence. It emphasizes the "continual process of improvement" (Deardorff, 2006, p. 257), where different aspects can influence others, making it a lifelong learning process (Deardorff, 2008).

Figure 3

Process Model of Intercultural Competence



Note. Process Model of Intercultural Competence. From "Identification and Assessment of Intercultural Competence as a Student Outcome of Internationalization", by D.K. Deardorff, 2006, *Journal of Studies in International Education, 10*(3), p. 256. Copyright 2006 by SAGE Publications.

Method

A qualitative systematic literature review was conducted to answer the question: how do the outcomes of CBL in higher education align with intercultural competence development models?

The objective of this qualitative systematic literature review is to explore the relationship of CBL and intercultural competence in higher education. This was done by aligning outcomes of this educational approach with three theoretical models about intercultural competence development used as an analytical framework. Specifically, the Bennet's model of Developmental Model of Intercultural Sensitivity by Bennett (1986), the Developmental Model of Intercultural Maturity by King and Baxter Magolda (2005), and the Process Model of Intercultural Competence by Deardorff (2006, 2008) were used to explore this alignment. These three models provide a comprehensive framework for understanding how intercultural competence develops, all three providing different nuances to the details of intercultural competence development. The Developmental Model of Intercultural Sensitivity by Bennett (1986) provides insight into the importance of progressing from ethnocentrism to ethnorelativism while developing intercultural competence. Meanwhile, the Developmental Model of Intercultural Maturity by King and Baxter Magolda (2005) emphasizes different stages of development of personal growth. Finally, Deardorff's Process Model of Intercultural Competence (2006; 2008) emphasizes the dynamic, interlinked and continuous process towards an interpersonal level of intercultural interactions. Together, these models provide a multidimensional framework suitable for acquiring knowledge of the alignment of outcomes of CBL with intercultural competence development.

The data was analysed through a thematic analysis as described by Braun and Clarke (2006), which provided the opportunity to explore this alignment through different themes in the literature.

Data collection

During the data collection process, several key concepts related to the research question were used: CBL, intercultural competence, and higher education. Specifically for CBL, the following

keywords were included while formulating the search strings: “challenge based learning”, “challenge-based learning” and “CBL”. For intercultural competence the keywords “intercultural competence”, “cultural competence”, “intercultural skills”, “intercultural maturity” and “cross-cultural competence” were included in the search string. Finally, to narrow the scope to higher education the keywords “tertiary education”, “higher education”, “university”, “HEI”, “bachelor”, “undergraduate”, “master”, “graduate”, “student” and “learn” were included in the search string.

These keywords were combined in two complementary search strings, which included Boolean Operators (Appendix 1). The first search string focused on the implicit alignment of CBL with intercultural competence in higher education and focused solely on CBL in higher education, while the second search string focused on the explicit alignment of CBL with intercultural competence in higher education by included the terms related to intercultural competence in the search string. It is important to note that for the terms competence, university, student and learn the asterisk wildcard (*) was used. This asterisk “represents any group of characters, including no character” (Web of Science, 2022, para. 1) and includes different variations of spelling of the specific terms. For example, the term “universit*” was included in the search string to ensure literature that mentions both university and universities were considered.

While the objective of a systematic literature review is “to identify all empirical evidence that fits the pre-specified inclusion criteria to answer a particular research question or hypothesis” (Snyder, 2019, p. 344), the literature from only one database (Web of Science) was considered due to the scope of this research and time constraints. Web of Science was last consulted for data collection on 3 May 2025.

In order to narrow down the available literature up for consideration, filters were applied simultaneously to applying the first search string. First, the publication date was limited from January 1st 2001 up to April 1st 2025, as CBL is an upcoming educational approach that was mentioned in the literature first in 2001, according to Gallagher and Savage (2020). Second, only literature written in English was included. Third, only literature included in the research area “Education Educational Research” from Web of Science was considered since CBL is an educational approach. This was done to narrow down the available literature according to

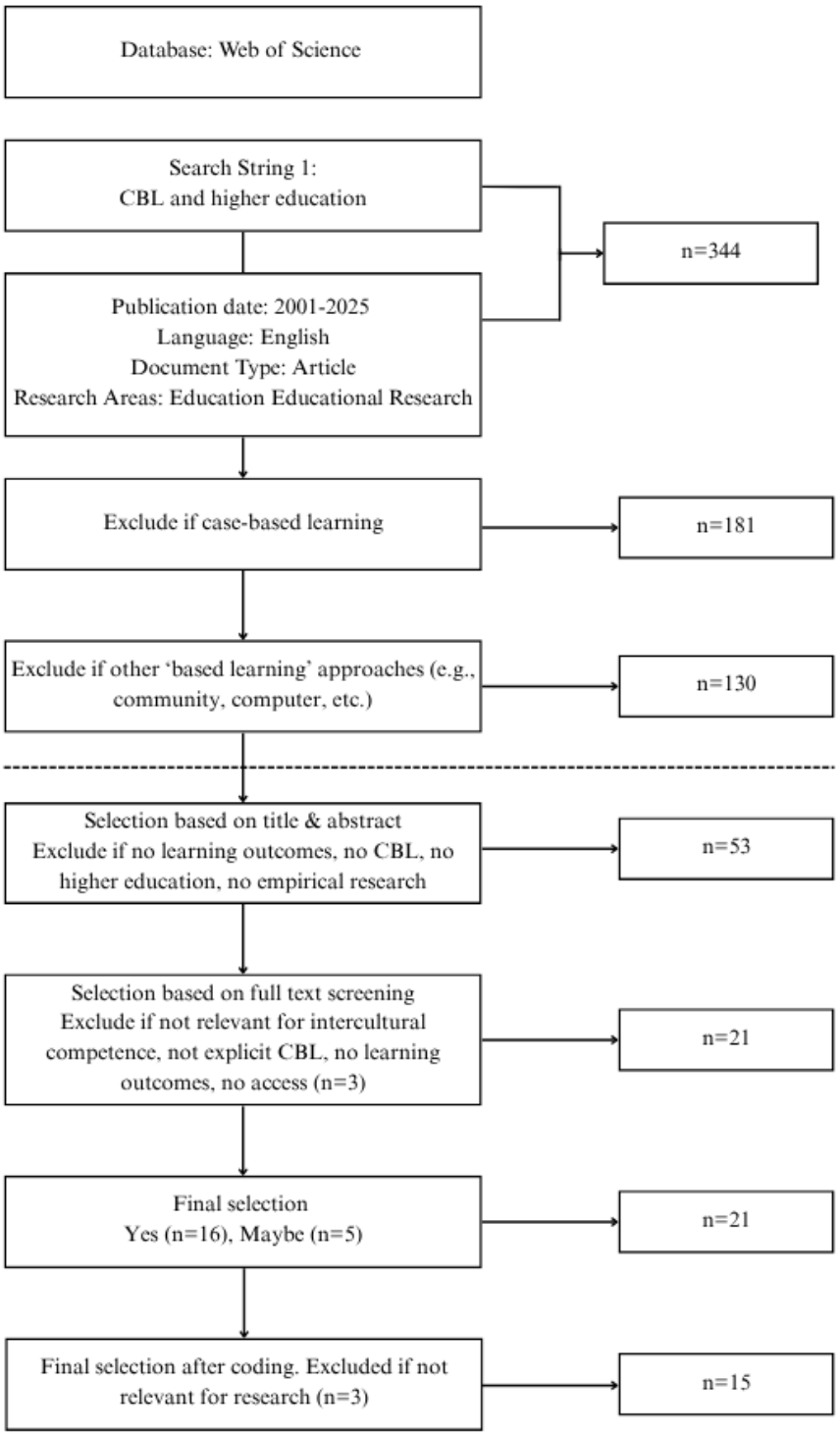
relevance to the topic. Finally, the literature was filtered to include only articles as document type.

The first search string (Appendix 1), considering implicit alignment of CBL in higher education with intercultural competence, generated a large body of literature that could potentially be included in the analysis (n=344) (see Figure 4). After this step, an initial screening on title and abstract was carried out to determine if articles should be included in this research. Articles were selected included if they mentioned CBL, learning outcomes, if it was empirical research and if the article focused on CBL in higher education. However, during this process, the term case-based learning showed up frequently under the acronym CBL. This led to a refinement of the research string to exclude results with case-based learning (see Figure 4). This led to a significant decrease of potential articles to include (n=181). The continued process of screening on titles and abstracts showed that other terms that were related to CBL or used a similar acronym were still included in the body of literature. Another adjustment was made to exclude all terms that used the acronym CBL differently compared to this research (see Figure 4). The following terms were excluded from the search, additional to case-based learning, collaborative-based learning, computer-based learning, context-based learning, clinic-based learning, community-based learning, and content-based learning. This exclusion of terms led to 130 available articles that were all screened on title and abstract (n=130).

The screening on title and abstract led to a more manageable number of articles (n=53). These articles were then selected based on a full text screening. During the full text screening, articles were excluded if they were not relevant for intercultural competence, if they did not have a clear link to CBL, if they did not mention any learning outcomes for students, or if the articles were not accessible (n=3). The final number of articles selected was 21, of which 16 articles were coded “yes” to include, and 5 as “maybe” to include (n=21). During the coding process, initially three articles were excluded due to different definitions of CBL and their focus on academic performance rather than a broader spectrum of learning outcomes. Eventually, three more articles were excluded during the analysis process due to similar reasons as well as irrelevance for the research. This means that the final number of included articles is fifteen (n=15) (see Figure 4).

Figure 4

Flowchart



Data analysis

The data was analysed following the thematic analysis approach as outlined by Braun and Clarke (2006). They understand thematic analysis as "a method for identifying, analysing and reporting patterns (themes) within data" (Braun & Clarke, 2006, p. 79).

The first step in thematic analysis by Braun and Clarke (2006), is to familiarize yourself with the data. They recommend reading all data at least once, preferably re-read it and to read all literature actively by taking notes of thoughts and patterns. The familiarizing with the data was done during the first selection of screening on title and abstract, but mostly during the second selection process which included full text screening. This step allowed further exploration of the content of the literature.

The second step of thematic analysis is to generate initial codes. A combination of deductive and inductive coding was used during the analysis process. For this research, that meant that the starting point was deductive coding based on the theoretical models of Bennett (1986), King and Baxter Magolda (2005) and Deardorff (2006, 2008). Each model was understood individually as a theme. Subthemes and codes related to the models were then determined based on the structure of the models and were developed accordingly. These themes can be understood as a guiding framework that was used during the analysis.

Bennett's Developmental Model of Intercultural Sensitivity (1986) consists of two phases: ethnocentrism and ethnorelativism. These two phases consist of three stages each that describe the stages someone goes through in their process of developing intercultural sensitivity. These six stages were used as deductive subthemes during the thematic analysis. As Bennett's model incorporates less layers than the models of King and Baxter Magolda (2005) and Deardorff (2006, 2008), the six stages were used as a sole analytical unit. An overview of the deductive themes derived from the Developmental Model of Intercultural Sensitivity is visualized in Table 1.

Table 1

Subthemes and codes for Developmental Model of Intercultural Sensitivity

Subtheme	Code
Denial	
Defense	
Minimization	
Acceptance	
Adaptation	
Integration	

Note. Subthemes and codes derived from Bennett (1986)

The second model that was used in the analysis, the Developmental Model of Intercultural Maturity by King and Baxter Magolda (2005), discusses cognitive, intrapersonal and interpersonal dimensions of the process of reaching intercultural maturity. These three dimensions were established as three subthemes. Since the model of King and Baxter Magolda (2005) consists of more layers than Bennet's model (1986), the three subthemes "cognitive dimension", "intrapersonal dimension", and "interpersonal dimension" were assigned two codes each that were derived from the model (see Table 2).

Table 2

Subthemes and codes for Developmental Model of Intercultural Maturity

Subtheme	Code
Cognitive dimension	Perspective taking
	Using cultural frames
Intrapersonal dimension	Challenging views
	Self-awareness
Interpersonal dimension	Appreciating differences
	Respectful interactions

Note. Subthemes and codes derived from King and Baxter Magolda (2005)

Finally, Deardorff's Process Model of Intercultural Competence (2006, 2008) proved to be the most extensive model with five subthemes and fourteen codes that have been deductively derived from the model. These five subthemes all play a central role in Deardorff's dynamic model and are interrelated. In order to provide more analytical depth, several codes have been appointed to each subtheme based on Deardorff's model and her brief explanation of the central concepts (see Table 3).

Table 3

Subthemes and codes for Process Model of Intercultural Competence

Subtheme	Code
Attitudes	Respect
	Openness
	Curiosity & Discovery
Knowledge & comprehension	Cultural self-awareness
	Deep cultural knowledge
	Sociolinguistic awareness
Skills	To listen, observe & evaluate
	To analyze, interpret & relate
Internal outcome	Adaptability
	Flexibility
	Ethnorelative view
	Empathy
External outcome	Effective and appropriate behaviour
	Effective and appropriate communication

Note. Subthemes and codes derived from Deardorff (2006, 2008)

Additional to the deductive themes related the intercultural competence development models, characteristics of CBL were also used as subthemes during the coding process to identify how the selected articles aligned with the key principles of CBL in their educational approach. These themes were developed based on the work of Gallagher and Savage (2020). However, due to the large number of subthemes and codes, it was decided to focus only on two characteristics of CBL that are related to the organization of collaboration between students: "multidisciplinarity or interdisciplinarity" and "transdisciplinarity".

Besides the deductive themes developed based on theoretical models on intercultural competence development and CBL prior to the coding process, inductive codes were developed during the coding process, which was done with the software NVivo. These codes were developed when themes were reoccurring or potentially interesting for the outcomes of this research. During the coding process, extracts were either assigned no code, one code or multiple codes if the extract applied to multiple aspects of the developed codes.

The third phase according to Braun and Clarke (2006) is to search for themes in the extracted data. However, as the thematic analysis departs from a deductive approach and the main themes were already developed before the start of the coding process, this step had a different focus. Instead of developing new themes from the data, the alignment of the initially formulated themes with the literature was reviewed in light of the codes developed, including the inductive codes. In this step, the inclusion of inductive codes was considered, and subthemes were reconsidered and reviewed by (re)grouping the coded data under the main themes. During the third step, several codes were placed in the inductive theme "unsure where". Additionally, during this initial coding process, six articles were excluded from the analysis due to insufficient relevance related to the research focus and learning outcomes. For example, articles were excluded due to a primary focus on academic learning outcomes while others educational approaches did not sufficiently align with CBL.

The fourth step focuses on reviewing and refining the developed themes (Braun & Clarke, 2006). During this step, the alignment between the developed codes and the predefined themes was reviewed to ensure the fit of the codes within the themes they were assigned to. This part

of the review was conducted on two levels: on the level of coded extracts and on the level of the entire dataset.

During this step, inductive codes were also reviewed to ensure a proper fit with (sub) themes. If not, they were moved to another, more suitable (sub) theme, kept as an individual theme or they were removed as code in case they were not supported enough in the data to be included in the analysis. For example, data extracts from the theme unsure where were reassigned to relevant deductive or inductive themes.

During the fifth step of thematic analysis by Braun and Clarke (2006), the subthemes and codes were critically evaluated to judge if they accurately reflect the data and if the content of each subtheme was coherent. Additionally, in the case of some inductive themes, it was decided to either keep the data, move the data or remove the data all together. This was the case for the inductive theme “problem-solving”. The data extracts were assigned to other themes, and it was decided to not include the theme in further analysis as this theme did not have enough relevance for answering the research question. The final inductive themes included in the thematic analysis are: “barriers or challenges”, which indicates challenges students experienced in their collaboration with peers, “international context”, which indicates if the studies took place in an international setting, and “CBL mix”, which indicates if other educational approaches were used in the study besides CBL.

Throughout the sixth and final step of Braun and Clarke (2006), the first steps towards producing a report based on the story that the data provides were taken. This included describing the content of the (sub)themes and codes, providing clear names for (sub)themes and codes and composing an overview in the form of a codebook. This codebook can be found in Appendix 2 and includes the deductive themes, subthemes and codes based on the theoretical models, relevant characteristics of CBL and inductive codes that were developed during the coding process. During this process, it was decided to exclude subthemes and codes that had too little or no relevant data extract assigned to them.

In total, 14 subthemes and 20 codes derived from the three theoretical models made up the deductive coding framework. In addition, 2 themes were developed deductive regarding CBL

characteristics and 3 themes were developed inductively. For Bennett's Developmental Model of Intercultural Sensitivity (1986), 4 out of 6 subthemes were excluded in further analysis due to them not yielding sufficient data to include in the analysis. The subthemes “acceptance” and “adaptation” were included in the rest of the analysis. For the theme Developmental Model of Intercultural Sensitivity from King and Baxter Magolda (2005) all three subthemes were included in the analysis. However, the code “using cultural frames” was excluded due to an absence of meaningful data excerpts. All 5 subthemes were included related to the Process Model of Intercultural Competence by Deardorff (2006, 2008). However, 3 codes were excluded due to limited or no data being assigned to these codes. Considering all exclusions, the final stage of data analysis consisted of 15 subthemes and 16 codes.

Results

This section discusses the outcomes of the thematic analysis based on the selected literature and the developed codebook (see Appendix 2). Below, the results are presented per theme, sorted according to the models of intercultural development.

The Developmental Model of Intercultural Sensitivity by Bennet (1986) has six elements that have been used as subthemes in the deductive thematic analysis. The themes that are connected to the ethnocentric stage of Bennett’s model, denial, defense and minimization, were not supported by any data excerpts from the literature. Additionally, the final stage of Bennet’s model, integration, was also not supported by any data. However, the themes acceptance and adaptation were prevalent in the literature. The thematic analysis shows that the theme acceptance came forward in 9 out of 15 studies, with 19 data extracts, mostly related to collaboration with peers and communication (Bravo et al., 2024; Hitt et al., 2025; Mesutoglu et al., 2024; Morselli & Orzes, 2023; Rådberg et al., 2020; Sluijs et al., 2024; Valentijn et al., 2023, Vilalta-Perdomo et al., 2022; Yang et al., 2018). The theme acceptance refers to someone acknowledging and accepting different cultures (Bennett, 1986). Acceptance can be illustrated by the following excerpt: “[i]f the students did not fully understand each other’s ideas and criticized them at an early stage, those ideas may be restricted, potential highlights would be missed and nothing interesting would be found. Therefore, a sharing, supportive and non-threatening environment was created using CBL” (Yang et al., 2018, p. 45). This excerpt shows

that students were able to accept differences between them and peers, while ensuring a collaborative environment. Additionally, 14 excerpts from 9 articles with relevant information regarding the theme adaptation were identified in the literature (Bravo et al., 2024; Gil-Molina et al., 2024; Kools et al., 2024; Membrillo-Hernández et al., 2023; Mesutoglu et al., 2024; Moore et al., 2023; Sluijs et al., 2024; Vilalta-Perdomo et al., 2022; Yang et al., 2018). This stage in Bennet's Developmental Model of Intercultural Sensitivity can be understood as the ability for someone to leave their own cultural comfort zone while being able to interact with culturally diverse others (Bennett, 1986). This stage was found in the article of Kools et al. (2024), who found that students "highlighted the interdisciplinary nature of translational work, emphasizing the need to engage with professionals from diverse fields and adapt to their needs in order to foster effective collaboration" (p. 10), which illustrates that students were able to go out of their comfort zone to ensure a smooth and effective collaboration between them and partners from different backgrounds.

The second model that has a central role in this research, is the Developmental Model of Intercultural Maturity by King and Baxter Magolda (2005). First, the subtheme cognitive dimension, which can be understood as the ability someone has to understand cultures and their differences, has been assigned two codes that support it (King & Baxter Magolda, 2005). The code perspective taking was assigned 18 different extracts from 9 articles (Bravo et al., 2024; De Stefani & Han, 2022, Gil-Molina et al., 2024; Kools et al., Mesutoglu et al., 2024, Rådberg et al., 2020; Sluijs et al., 2024; Vilalta-Perdomo et al., 2022; Yang et al., 2018). Perspective taking at a mature level of intercultural development, can be understood as being able to shift between cultural perspectives (King & Baxter Magolda, 2005). This can be demonstrated by the following: "[f]or instance, Student A indicated that he increased his awareness of the importance of including different perspectives when taking decisions within the team's board" (Bravo et al., 2024, pp. 347-348). The second code assigned to the subtheme cognitive dimension is using cultural frames, which was not assigned any data extracts during the thematic analysis.

Second, the subtheme intrapersonal dimension focuses on someone's ability to accept other cultures and to not see them as a threat of one's own culture (King & Baxter Magolda, 2005). The code challenging views emerged in 3 articles, with 6 data excerpts (Hitt et al., 2025;

Rådberg et al., 2020; Yang et al., 2018). Challenging views emphasizes the notion of challenging one's own views in interaction with culturally diverse others. This emerged in Rådberg et al (2020): "[o]thers put forward the perspective that specific knowledge is valuable in developing new knowledge across disciplines: I never thought one could think of a system in so many ways. I have learned a lot related to my own area just by working together closely with someone who had a different perspective" (p. 31). The code self-awareness, where someone is able to understand their own cultural identity (King & Baxter Magolda, 2005), was identified in 5 articles (Bravo et al., 2024; Membrillo-Hernández et al., 2023; Moore et al., 2023; Morselli & Orzes, 2023, Sluijs et al., 2024). The following extract illustrates how can be understood in an educational setting: "[i]nterdisciplinary teamwork stimulated students to gain insight in the value of their own discipline and to be more appreciative toward other scientific disciplines" (Sluijs et al., 2024, p. 4166). This excerpt shows specifically that students learned to be aware of their own discipline, and thus their own academic identity.

Finally, the subtheme interpersonal dimension from King and Baxter Magolda focuses on the ability to both understand and appreciate different perspectives someone might have (2005). The first code of this dimension is appreciating differences, of which 13 data excerpts were selected from 7 articles (De Stefani & Han, 2022; Gil-Molina et al., 2024; Membrillo-Hernández et al., 2023; Rådberg et al., 2020; Sluijs et al., 2024, Valentijn et al., 2023; Vilalta-Perdomo et al., 2022). The code can be described as someone being able to understand different perspectives and appreciate them, when someone reaches a mature development level (King & Baxter Magolda, 2005). This can be clarified with the following fragment from Valentijn et al. (2023, p. 204): "[r]egarding collaboration, students became aware of the importance of peer feedback and each other's perspective: "I became more inclined to seek peer feedback and became aware of the importance of others' different perspectives. And also that you can be useful to other groups"". This fragment shows that a student gained awareness of other perspectives that team members brought, as well as the benefits of these diverse perspectives. The second code related to the interpersonal dimension is respectful interactions. In total, this code appeared 20 times in the analysed literature, spread out over 10 articles (Bravo et al., 2024; Gil-Molina et al., 2024; Hitt et al., 2025; Kools et al., 2024; Lara-Prieto et al., 2023; Membrillo-Hernández et al., 2023; Moore et al., 2023; Morselli & Orzes, 2023; Sluijs et al., 2024; Yang et al., 2018). When someone has reached a mature level of intercultural development, they are

able to treat different perspectives and beliefs with respect, while still being true to their own perspectives and beliefs (King & Baxter Magolda, 2005). This is visible in Kools et al. (2024): "[t]hey emphasized the significance of collaboration among the students, highlighting their ability to share the workload, work together harmoniously, and assign relevant tasks to the appropriate team member, thereby overcoming potential barriers such as language" (p. 12).

The last theoretical model included in the analysis, is the Process Model of Intercultural Competence by Deardorff (2006, 2008), which has six subthemes. The first subtheme is attitudes, consisting of the three different codes of respect, openness, and curiosity, and can be described as the starting point for someone's journey towards intercultural competence (Deardorff, 2006, 2008).

The first code under attitudes, is respect. This code was identified 5 times, in 3 articles (Gil-Molina et al., 2024; Membrillo-Hernández et al., 2023; Sluijs et al., 2024). Someone has the attitude of respect when they are able to value and respect cultures different to their own (Deardorff, 2008). This code is illustrated by the following quote from Membrillo-Hernández (2023): "students were able to develop sustainability competencies and skills to communicate effectively through online interaction with people from different cultures and disciplines, showing pride in their national identity and respect for the richness and characteristics of other cultures" (p. 19). The second code within the subtheme attitudes is openness. This can be understood as someone being able to withhold judgement towards other cultures and during interaction with culturally diverse others (Deardorff, 2006, 2008). Openness was identified 15 times in 8 articles (De Stefani & Han, 2022; Gil-Molina et al., 2024; Hitt et al., 2025; Mesutoglu et al., 2024; Rådberg et al., 2020; Valentijn et al., 2023; Vilalta-Perdomo et al., 2022; Yang et al., 2018). This code is represented in Mesutoglu et al. (2024): "'Communication' emerged as a facilitator of multidisciplinary teamwork. Multiple instances in the video transcripts demonstrated how the students comfortably expressed their ideas, listened, asked questions, and provided suggestions" (p. 648). This showcases an open attitude towards others. The third and final code related to attitudes is curiosity and discovery, which was established in 4 articles (Lara-Prieto et al., 2023; Mesutoglu et al., 2024; Rådberg et al., 2020; Yang et al., 2018), through 9 different data extracts. This code is defined as the ability to tolerate ambiguity during interactions with others and the ability to show interest and curiosity (Deardorff, 2008). This is

illustrated in the following: “[e]xperiential learning at the beginning of undergraduate engineering studies proved to be, at least in this study, a trigger for students’ curiosity and rapid acquisition of skills such as critical thinking, collaborative work, complex reasoning, and problem-solving” (Lara-Prieto et al., 2023, p. 274).

The second subtheme, knowledge and comprehension, has three codes based on Deardorff’s model. However, the codes deep cultural knowledge and sociolinguistic awareness yielded 0 and 1 data extractions (Gil-Molina et al., 2024), respectively, and were not included in further analysis. The code cultural self-awareness yielded 5 data excerpts from 3 articles (Membrillo-Hernández et al., 2023; Moore et al., 2023; Sluijs et al., 2024) and can be understood as the ability someone has to understand their own culture on a deep level (Deardorff, 2008). For example, “students mentioned becoming aware of their own discipline in interdisciplinary collaboration, appreciating their own discipline better, and learning what they could contribute to interdisciplinary problem-solving” (Sluijs et al., 2024, p. 4169).

The third subtheme, skills, has two codes: to listen, observe and evaluate, and to analyze, interpret and relate. These are understood as important skills for developing intercultural competence through awareness and cultural knowledge (Deardorff, 2008). The code to listen, observe and evaluate was found in 15 excerpts from 10 articles (Bravo et al., 2024; Gil-Molina et al., Hitt et al., 2025; Kools et al., 2024, Lara-Prieto et al., 2023; Mesutoglu et al., 2024; Rådberg et al., 2020, Valentijn et al., 2023; Vilalta-Perdomo et al., 2022; Yang et al., 2018). Hitt et al. illustrate this: “‘[e]nhanced my ability to listen actively and show my empathy when collaborating with others’, received the highest rate of strong agreement, with 67%” (2025, p. 12). Additionally, the code to analyze, interpret and relate came forward in 6 articles, through 11 excerpts (Gil-Molina et al., 2024; Lara-Prieto et al., 2023; Rådberg et al., 2020; Sluijs et al., 2024; Vilalta-Perdomo et al., 2022; Yang et al., 2018). An example of this can be found in Rådberg et al., (2020): “CBL experiences similar to those of Challenge Lab can offer opportunities for projects that could strengthen the participants’ skills in problem identification and formulation, multidisciplinary collaboration and communication” (p. 34).

The fourth subtheme internal outcome focuses on the change someone goes through when their frame of reference changes towards different cultures (Deardorff, 2008). From the four codes

related to this subtheme, the code ethnorelative view only yielded one excerpt from one article and was excluded from further analysis (Rådberg et al., 2020). The code adaptability was found in 9 articles and 17 excerpts were identified (Bravo et al., 2024; De Stefani & Han, 2022; Gil-Molina et al., 2024; Kools et al., 2024; Morselli & Orzes, 2023; Rådberg et al., 2020; Sluijs et al., 2024; Vilalta-Perdomo et al., 2022; Yang et al., 2018). Adaptability can be understood as the ability to be able to adapt between different cultures (Deardorff, 2008). This is showcased by the following reflection of a student: "[u]s students representing different educational backgrounds, coming from many different countries and working with stakeholders from industry, academia and government, it took some time and a lot of frustration to understand how to navigate. I think we found a way where we discussed a lot to make sense of, for instance, the meaning of 'sustainability' or 'system'" (Rådberg et al., 2020, p. 32), which shows the ability to adapt to cultural differences. The code flexibility was found in 6 articles, yielding 9 data excerpts (De Stefani & Han, 2022; Kools et al., 2024; Morselli & Orzes, 2023; Rådberg et al., 2020; Vilalta-Perdomo et al., 2022; Yang et al., 2018). Flexibility can be understood as someone being able to shift between different behaviours and worldviews (Deardorff, 2008). For example: "[...] one focus group even mentioning the importance of learning to deal with the heterogeneity of the team" (Morselli & Orzes, 2023, p. 6). The final code within internal outcomes is empathy, which was found in 1 article, yielding 5 data excerpts (Sluijs et al., 2024). This code is understood as someone being able to show empathy towards cultural differences and trying to understand different perspectives (Deardorff, 2008). This is reflected in the following quote: "we learned that transdisciplinary CBL combined with design thinking is an adequate pedagogical framework to facilitate growth of sustainability change-maker competencies, such as empathy, creativity, collaborative teamwork, stakeholder engagement, and integrative problem-solving (Sluijs et al., 2024).

Finally, the last subtheme for the theme of Deardorff's Process Model of Intercultural Competence is external outcomes. This subtheme is understood as the results of a mental shift towards effective and appropriate behaviour and communication (Deardorff, 2006, 2008), which are the codes for this subtheme. The code effective and appropriate behaviour can be defined as someone showing that they can interact appropriately and effectively with others in intercultural situations (Deardorff, 2008). This was found 9 times in 5 articles (Bravo et al., 2024; Kools et al., 2024; Morselli & Orzes, 2023; Sluijs et al., 2024; Vilalta-Perdomo et al.,

2022). Effective and appropriate behaviour is exemplified in the following citation: "[a]ll seven students also reported learning gains in working in teams. This included conflict resolution, negotiation, multi-perspective collaboration, and stakeholder engagement" (Bravo et al., 2024, p. 347). Furthermore, the code effective and appropriate communication came back in 12 articles and 40 data excerpts (Bravo et al., 2024; Gil-Molina et al., 2024; Hitt et al., 2025; Kools et al., 2024; Lara-Prieto et al., 2023; Membrillo-Hernández et al., 2023; Mesutoglu et al., 2024; Moore et al., 2023; Rådberg et al., 2020; Valentijn et al., 2023; Vilalta-Perdomo et al., 2022; Yang et al., 2018). An example of students being able to communicate effectively and appropriately can be found in the following excerpt: "[t]he interdisciplinary setting mainly contributed to collaboration and communication skills, and stimulated a collaborative, communicative, and creative mindset" (Valentijn et al., 2023, p. 206).

In addition to the deductive codes based on the three theoretical models above, 3 inductive themes were developed during thematic analysis. The first one, barriers or challenges, was identified in 13 excerpts from 7 different articles (De Stefani & Han, 2022; Gil-Molina et al., 2024; Kools et al., 2024; Mesutoglu et al., 2024; Rådberg et al., 2020; Valentijn et al., 2023; Vilalta-Perdomo et al., 2022). An example of barriers or challenges is: "some students felt that a lack of effective communication created a stressful atmosphere and undermined their ability to progress and complete the task in a more efficient way" (Vilalta-Perdomo et al., 2022, p. 11). A second inductive theme is CBL mix. Two studies combined CBL with another education approach. To illustrate, Membrillo-Hernández et al. (2023) used Collaborative Online International Learning in a Global Classroom setting to introduce students to CBL. The third inductive theme is international context. Four articles reported that they took place in an international context (De Stefani & Han, 2022; Gil-Molina et al., 2024; Membrillo-Hernández et al., 2023; Moore et al., 2023). This is illustrated by Moore et al.: "[a]ltogether, as of writing, 281 students from Europe, Africa, and North America took part in the VEC in either English, French, or French Sign Language (LSF)" (Moore et al., 2023, p. 3).

Additionally, the characteristic of CBL, multidisciplinarity or interdisciplinarity, was identified in 14 out of 15 studies, except for in Yang et al. (2018), indicating that during almost all studies students collaborated in diverse groups. In addition, 11 out of 15 articles indicated that students participated in transdisciplinary collaboration (Bravo et al., 2024; De Stefani & Han, 2022; Gil-

Molina et al., 2024; Hitt et al., 2025; Kools et al., 2024; Mesutoglu et al., 2024; Moore et al., 2023; Morselli & Orzes, 2023; Rådberg et al., 2020; Sluijs et al., 2024; Vilalta-Perdomo et al., 2022).

To summarize, 14 subthemes, of which 4 were excluded due to limited or no supporting data, and 20 codes, of which 4 were excluded in further analysis due to the same reasons, were used in this thematic analysis deductively based on the three theoretical models of Bennett (1986), King and Baxter Magolda (2005), and Deardorff (2006, 2008). This yielded a total of 235 data excerpts. Furthermore, a total of 3 inductive themes were developed, which yielded a total of 85 data excerpts, together with the characteristics of CBL.

These findings will be further discussed in light of intercultural competence development according to the three theoretical models in the discussion section below.

Discussion

This section will reflect on the findings of the thematic analysis. First, the findings are discussed by each individual theoretical model. Second, a comparison between models is made, followed by discussion of contextual considerations. The discussion of the findings is followed by a reflection on the limitations of this thesis and recommendations for future research.

Developmental Model of Intercultural Sensitivity

The Developmental Model of Intercultural Sensitivity by Bennett (1986) shows the process of how someone moves from an ethnocentric phase, where they view their own cultural background as the only correct one, towards ethnorelativism, where someone is appreciative and understanding towards other cultures and can even integrate it in their own identity, in the last stage of integration.

Acceptance, as part of the ethnorelative stage, was prominent in the data and was identified in nine studies. Students from all these studies indicated that they accepted the differences within their teams and even valued it in their learning process, even though it took time for them to

navigate their differences and to create a supportive learning environment through CBL. The second subtheme that was assigned several data excerpts during this thematic analysis is adaptation. Additionally to accepting and valuing different perspectives, students indicated that they learned how to modify their communication based on the different backgrounds and integrated different perspectives in their way of working. This indicates that students did not only show their competence in acceptance, but also in adaptation to other perspectives.

No relevant data was assigned to the subthemes denial, defense, minimization and integration. There are several possible reasons as to why no relevant data was assigned to these subthemes in Bennett's model (1986). First, the articles mostly focused on exploring learning outcomes and did not necessarily include a status quo before the learning experience. For this specific model, this means that there was no or too little information about ethnocentric stages such as defense, denial and minimization among students. Additionally, the final stage of ethnorelativism, the integration stage, means that someone is able to go beyond their own cultural identity while also being able to integrate aspects of different cultures simultaneously (Bennett, 1986). Measuring this highly developed cultural sensitivity goes beyond the scope of the studied literature and this thesis. Thus, no conclusions can be drawn about the development of this stage for students in CBL education through this thematic analysis. Due to the absence of data referring to the ethnocentric stages in the data, and the absence of the final ethnorelative stage of integration, Bennett's Developmental Model of Intercultural Sensitivity may only offer a limited opportunity to analyse the learning process of intercultural competence in CBL settings. A longitudinal study would be more suitable to use this model to its full potential.

However, considering that the data shows that student learning outcomes in CBL settings show both acceptance and adaptation among students, it is possible that students have developed towards ethnorelativism.

Developmental Model of Intercultural Maturity

The Developmental Model of Intercultural Maturity from King and Baxter Magolda (2005) illustrates the three different stages of intercultural maturity, including cognitive elements such as understanding others, interpersonal elements like being sensitive to others, and intrapersonal elements that empower a person to learn and listen to someone with a different cultural

background. Even when students had to overcome challenges in their collaboration, they gained insights in the importance of using different disciplinary perspectives (Mesutoglu et al., 2024). Additionally, perspective taking seemed to be a common learning outcome in these articles. In all nine articles, students demonstrated having learned to integrate different perspectives, showing the ability to take on different perspectives while maintaining an open attitude towards differences.

One theme that was not identified in any articles during the data analysis was using cultural frames. This absence of relevant data is unexpected as one would expect a certain degree of overlap between being able to shift perspectives and being able to use multiple cultural frames, which are both a mature level of development of intercultural maturity according to King and Baxter Magolda (2005). One possible reason for this absence might be found in the coding process: due to the large number of subthemes and codes, some concepts may have been overlooked while coding the literature. In this case, more focus might have been subconsciously placed on perspective taking instead of focussing on using cultural frames as well.

Additionally, the code of perspective taking also appears to be related to challenging views of the intrapersonal dimension. When someone is at a mature level of development, they are able to challenge their own beliefs and views (King & Baxter Magolda, 2005). However, the code challenging views, which falls under the subtheme intrapersonal dimension, was only identified in three articles, as mentioned in the results section. This is surprising as one would expect that perspective taking needs a certain degree of being able to challenge your own views during intercultural interactions.

The other code related to the intrapersonal dimension is self-awareness, where someone shows awareness and understanding of their own cultural identity, including beliefs and values (King & Baxter Magolda, 2005). According to Sluijs et al. (2024), this self-awareness can be beneficial in interdisciplinary collaboration, as it helps students to understand their own discipline better. The importance of self-awareness for intercultural competence development is also emphasized by Barrett and Borghetti (2025), who argue that awareness of the differences between participants of an interaction is important to identify cultural differences, although how these differences are perceived can differ for individuals.

The cognitive and intrapersonal dimensions are also linked to the interpersonal dimension, which focuses on appreciating differences and respectful interactions. At a mature level of intercultural development, someone will be able to both understand and appreciate different beliefs and perspectives and will treat these with respect (King & Baxter Magolda, 2005). The code appreciating differences was identified in seven studies, while respectful interactions was identified in most of the studies. These two themes seem to be interlinked. For example, students indicated to have learned from the different perspectives of their peers (Rådberg et al., 2020, Valentijn et al., 2023) but have also shown their ability to have respectful interactions by adjusting their communication (Bravo et al., 2024), practicing active listening (Gil-Molina et al., 2024) and avoiding conflicts between group members (Sluijs et al., 2024).

While relevant data was assigned to all three dimensions of the Developmental Model of Intercultural Maturity, the interpersonal dimension was assigned data most frequently. Having a mature development level in the interpersonal dimension means that someone is able to interact respectfully with diverse others, show understanding for their different perspectives and experiences, while upholding their own values (King & Baxter Magolda, 2005). The results of the thematic analysis, seem to indicate that students in a CBL setting have a mature development level, especially in interpersonal interactions. Keeping in mind that the other dimensions were also identified in the literature, but less frequently, this model seems to be suitable for analysing intercultural competence development in educational settings with a CBL approach.

Process Model of Intercultural Development

The Process Model of Intercultural Competence by Deardorff (2006, 2008) focuses on intercultural competence development from a personal level to an interpersonal level, influenced by someone's attitudes, knowledge and comprehension, and skills. This is a dynamic process, and the model should be interpreted like this as well. While the most efficient learning process starts at "attitudes" and ends at "external outcomes", the model is not linear and someone can move forward without developing their full potential in either of the segments (Deardorff, 2006, 2008). Attitudes is the starting point for this process, with respect, openness and curiosity and discovery empowering behavioural changes in favour of intercultural

competence development (Deardorff, 2006, 2008). According to Lara-Prieto et al. (2023), the experiential learning that comes with CBL positively impacted students' curiosity. Students showed respect for their peers and their different cultures and disciplines (Gil-Molina et al., 2024; Membrillo Hérnandez et al., 2023; Sluijs et al., 2024) and showed an overall open attitude (Yang et al., 2018). Deardorff (2008) understands these attitudes as necessary to develop intercultural competence further, as it showcases the ability of someone to increase their cultural knowledge. That the studies indicated that students show these attitudes, is thus potentially a sign of the start of intercultural competence development.

For the next aspect of Deardorff's model, knowledge and comprehension, only one code was assigned enough data excerpts during the data analysis to be included. Related to cultural self-awareness, students indicated that they developed cultural skills (Moore et al., 2023), were able to show appreciation for their own identities (Membrillo-Hernández et al., 2023) and for their own disciplines (Sluijs et al., 2024). Sociolinguistic awareness came forward only in 1 article (Gil-Molinda et al., 2024) and was not included in the thematic analysis. This can possibly be explained by a potential lack of focus on the development of competences related to sociolinguistics in the studies. Additionally, the code deep cultural knowledge was absent in all articles and not assigned any data excerpts. A possible explanation for this, could be found in the complexity of developing deep knowledge and/or a different research focus or student reflections that do not measure cultural knowledge in enough depth. Additionally, it is also possible that deep cultural knowledge was overlooked during the coding process.

In her model, Deardorff identifies different skills that influence intercultural competence development. The skill set of listening, observing and evaluating was identified in learning outcomes from the majority of the studies. Students demonstrated this skill set by improved active listening, increased negotiating skills, evaluating their own views and overall improved collaboration qualities. The skill set of analyzing, interpreting and relating was found less frequently, but six studies showed that students did have these skills at the end of their CBL experiences. Solving a challenge in a CBL setting can positively impact students' development of problem identification, problem solving and other learning strategies (Rådberg et al., 2020; Sluijs et al., 2024).

In the subtheme internal outcome, there was a notable variation in the distribution of data excerpts between the different codes. The codes ethnorelative view and empathy were surprisingly only identified in one study, while both flexibility and adaptability were more common in the data. De Stefani and Han (2022) reported that both flexibility and adaptability are characteristics that were seen as overarching for their CBL approach. Additionally, students showcased both flexibility and adaptability by creating a harmonious work environment (Kools et al., 2024), collaborating with peers and stakeholders with different perspectives and backgrounds (Gil-Molina et al., 2024; Morselli & Orzes, 2023; Rådberg et al., 2020) and changing their communication depending on their target group (Bravo et al., 2024; Morselli & Orzes, 2023).

When someone has reached a certain level of intercultural competence, they have gone through a mental shift, which yields measurable external outcomes, which is measurable by effective and appropriate behaviour and communication. Effective and appropriate behaviour was identified in the studies and relates to successful collaboration, not only within the student teams but also with external stakeholders, for example by applying negotiation skills, being able to resolve conflicts, and harmonious collaboration. However, the code that was assigned most frequent throughout the data was effective and appropriate communication, showing that a CBL approach often results in communicative learning outcomes, such as altering communication based on target group, improved communication in intercultural contexts and providing and receiving feedback. Additionally, effective and appropriate communication was often seen as essential for either intercultural, multidisciplinary, interdisciplinary or transdisciplinary collaboration in CBL. For example, communication can be understood as a facilitator of teamwork with a multidisciplinary setting (Mesutoglu et al., 2024). In the meantime, collaborating in these diverse settings also seems to contribute to the development of communication skills. For instance, Valentijn et al (2023) report that the interdisciplinary collaboration advanced both communication skills and a communicative mindset. However, it is important to note that even though one could assume that these indications of effective and appropriate communication indicate that students are quite far in their intercultural competence development, Deardorff emphasizes that this is a lifelong process so these results do not necessarily indicate that all students achieved a high level of intercultural competence (2006; 2008).

The Process Model of Intercultural Competence was assigned the largest number of relevant data compared to the other models. Although the component knowledge and comprehension was assigned relatively little relevant data, and not all elements under the component internal outcome were equally represented in the data, the components attitudes, skills and external outcomes were frequently identified in the literature. Considering that learning outcomes of CBL correspond to all components of Deardorff's model (2006, 2008), this model appears to be suitable for analysing the development of intercultural competence in CBL settings.

Comparison between models

While Bennett's model (1986) appears the least applicable to analyse intercultural competence development in the light of CBL, the models of King and Baxter Magolda (2005) and Deardorff (2006, 2008) demonstrate more alignment with learning outcomes of CBL. The thematic analysis illustrated that Bennett's model was only partially reflected in the data in the ethnorelative stages of acceptance and adaptation. Meanwhile, findings related to King and Baxter Magolda's model were most prevalent in their interpersonal dimensions of intercultural maturity. Related to Deardorff's model, the findings seem to have been spread relatively equally over the different components of the model, while two aspects of the components, knowledge and comprehension and internal outcomes, were represented less in the data.

Potential reasons for these differences can be found in the different structures and objectives of these models. Bennett's model has a linear nature and has a strong focus on differences between cultures (1986). In this case, where data is mostly originating from studies measuring learning outcomes from one learning activity instead of a longitudinal study, it is more complicated to assign elements to all different stages of the model. The final stage of integration is especially hard to identify in this short-term context, as this is a highly developed stage which assumes a deep understanding of different cultural identities, including their own.

Furthermore, the model of King and Baxter Magolda also emphasizes the development of intercultural maturity among students, where someone moves from less mature stages of development to a mature understanding of cultural differences (King & Baxter Magolda, 2005). Spitzberg and Changnon also indicate that this process happens in educational situations where

students can interact with others (2009). This educational context makes this model especially interesting for aligning learning outcomes of a CBL experience, which may explain why more relevant data was assigned to this model.

Finally, Deardorff's model has been reported to be influential in higher education (Arasaratnam-Smith, 2017) and is structured differently than the models of Bennett and King and Baxter Magolda. The model shows a cyclical process for intercultural competence development and Deardorff emphasizes the dynamic and lifelong nature of this process. This cyclical structure, starting from attitudes and progressing towards external outcomes, allows for development to take place in different phases. As a result, learning outcomes can be identified at different stages of the learning process, which is why Deardorff's model yielded the most relevant data. Similar to findings related to Bennett's model, there are a few elements in Deardorff's model that were not assigned any data or a relatively small number: deep cultural knowledge, empathy and ethnorelative view. This likely also has a similar reason as the lack of data related to the integration stage in Bennett's model: to have deep cultural knowledge, show empathy to others and be able to use an ethnorelative view assumes highly developed intercultural competence and in-depth knowledge of cultures (Deardorff, 2008), which is potentially why there was no data assigned to these two concepts.

Broader considerations

To gain a deeper understanding of the findings of this research, the context in which the analysed studies took place is important. Only four articles indicated their study took place in an international context. This shows that CBL in higher education does not always take place in an international context. However, the results of this analysis show that developing intercultural competences and this learning process can also take place outside of an international context. This is in line with Deardorff (2009) who understands intercultural competence in light of interpersonal differences, which are guided by people's feelings, thoughts and behaviours. These differences are not only found across national or ethnic contexts but also emerge in other interactions rooted in diversity, so potentially in multidisciplinary or interdisciplinary interactions as well. Only one study did not have a multidisciplinary or interdisciplinary setting. Collaborating in multi- or interdisciplinary teams seems to have positively influenced intercultural competence development. To illustrate, Rådberg et al. (2020)

show that students working in a diverse team gain deeper understanding of a topic by including different perspectives. Additionally, Sluijs et al. (2024) indicate that students gained awareness about the benefits of interdisciplinary collaboration. They learned to value their own scientific discipline and that of others, while being able to integrate different perspectives in their work (Sluijs et al., 2024). Furthermore, most of the studies indicated transdisciplinary collaboration in their education. This seems to contribute to flexibility and effective and appropriate behaviour and communication from Deardorff's model (2006, 2008), among other components from other models such as respectful interactions from King and Baxter Magolda (2005). For example, Bravo et al. (2024) and Kools et al. (2024) report that students learned to alter their communication according to their target audience, showing flexibility, effective communication and the ability to take part in respectful interactions.

There was one article that did not report a multi- or interdisciplinary context, nor did their education take place in a transdisciplinary context (Yang et al., 2018). However, due to meeting other characteristics of CBL, such as a real-life challenge, collaboration and a focus on innovation, the decision was made to include this study due to interesting learning outcomes related to the CBL approach. Students in their study encouraged each other to actively look for new perspectives that could be included in their research, attempted to challenge their own view and thinking patterns and created an overall open and supportive environment during their CBL experience (Yang et al., 2018). These examples are in line with elements from all three theoretical models: adaptation from Bennett's model (1986), challenging views and respectful interactions from King and Baxter Magolda's model (2005), and flexibility of Deardorff (2006, 2008), among others. These findings are in consistent with literature on collaborative learning that shows that this type of learning is beneficial for intercultural competence development through learning from different perspectives of peers (Guillén-Yparrea & Ramírez-Montoya, 2023).

In addition to the previously discussed theoretical models and their alignment with CBL and the influence of the broader context of the analysed studies, the reviewed articles also reported barriers that students dealt with during their CBL experience. Some of the mentioned barriers included differences in schedules during interuniversity collaboration and general availability (De Stefani & Han, 2022; Vilalta-Perdomo et al., 2022), feelings of discomfort to ask others to

take the lead in certain tasks (Kools et al., 2024), lack of disciplinary knowledge in multidisciplinary collaboration (Mesutoglu et al., 2024), navigating different backgrounds (Rådberg et al., 2020), complicated collaboration (Valentijn et al., 2023), and absence of effective communication strategies (Vilalta-Perdomo et al., 2022).

However, these barriers can also be seen as an opportunity for growth and students also overcame challenges. Students reported in Rådberg et al. (2020) that they overcame the challenges that came with working with a diverse team, with different academic and cultural backgrounds. They used communication skills, such as discussion of concepts, to achieve this. This was also reported by Kools et al. (2024), where students indicated they were able to overcome language barriers in their collaboration process. These efforts made by students to overcome barriers, indicate a certain degree of acceptance of differences, shows that students have obtained the adaptability and flexibility, while being able to have respectful interactions with their peers. In short, while these barriers are not explicitly mentioned in the outlined models of intercultural competence development, the learning outcomes related to overcoming these challenges are related to all three models, giving more insight in the learning process and the overall learning process in a CBL context.

Additionally, it is important to understand these findings in the light of a broader ESD-discourse, which is often dominated by Western perspectives and does not always include all global, future and non-human perspectives (Bengtsson, 2024, Kopnina, 2020), sometimes excluding alternative forms of education (Jickling & Wals, 2008). This potential limiting effect on how we see the world (Jickling & Wals, 2008) underlines the importance of including multiple perspectives in ESD as well as in CBL. Especially for educational approaches that influence intercultural competence development, including multiple perspectives is important to realize respectful and effective interactions with culturally diverse peers, as shown in this research.

Limitations

Several limitations should be considered while interpreting the findings of this thesis. First, the positionality of the researcher should be considered. While transparency and good academic conduct have been thoroughly considered while writing this thesis, having experience with CBL

in an academic and professional setting has potentially influenced data collection, data analysis and the interpretation of data. This, in combination with limited prior experience with thematic analysis and the absence of intercoder reliability, might have influenced the interpretation of the data. For instance, despite striving for objectivity in the analytical process, a certain degree of confirmation bias cannot fully be excluded.

Second, there are limitations related to methodological choices made. A deductive approach has potential for a confirmation bias, as the themes are predefined. However, the mainly deductive approach also may have caused a limited theoretical lens, due to the predefined themes. Additionally, the data collection and analysis took place as an interactive process, which was part subjectively done. For example, certain selection decisions were context based, such as including one study even though the study did not take place in an international, multidisciplinary, interdisciplinary or transdisciplinary setting, the results could still be interpreted in the light of the theoretical models (Yang et al., 2018). Moreover, the selection process was iterative, meaning that some articles were excluded during the coding process, instead of during earlier steps of the data selection process.

Third, there are some limitations regarding the selected literature. Only one database was used during the data collection process. While this choice was made due to time constraints and the scope of this thesis, this decision has possibly led to missing literature from other databases that would have been relevant for answering the research question. Additionally, a large majority of the analysed studies did not (explicitly) take place in an international context. Moreover, the data collection process showed only one article that simultaneously mentioned CBL and intercultural competence. As there was no explicit focus on intercultural competence development in the studies and not all studies took place in an intercultural context, the alignment of CBL with theoretical models of intercultural competence development was interpreted on CBL learning outcomes instead.

Finally, while the three models outlined in the theoretical framework were selected carefully, not all models were equally applicable on intercultural competence development in a higher education setting. Additionally, combining all three models during the data analysis resulted in a large number of subthemes and codes. This has led to overlap in certain themes, which Braun

and Clarke warn for in their paper (2006) as a potential pitfall. Additionally, this large number of subthemes and codes has led to a more complicated coding process, where sometimes some themes were overlooked in the process, causing limited analytical depth and influencing the interpretation of the data. Moreover, the scope of this research does not allow for drawing conclusions related to causality and for researching if CBL has a positive effect on the development of intercultural competence. This is partly due to differences of suitability of the models to analyse intercultural competence development in cross-sectional studies of learning outcomes of CBL. While interesting findings were identified, a different scope and longitudinal set up would allow for understanding the depth of the intercultural competence development models better. For example, the different stages of Bennett's model (1986) of intercultural sensitivity could be measured individually in longitudinal studies, as would it be possible to draw conclusions about different levels of intercultural maturity in longitudinal studies using King and Baxter Magolda's model (2005).

Recommendations

Based on the findings and limitations of this thesis, the following directions are suggested for further exploration of CBL and intercultural competence development. First, future studies should aim to include more sources, e.g., through more databases and other means, to gain a more thorough understanding of the available literature. Second, new studies about CBL in higher education in an international context would be recommended. During the selection process of relevant literature, only one study explicitly combined CBL and intercultural competence, indicating that this topic remains underexplored. Third, since this thesis was more explorative in nature, it would be beneficial to gain understanding about the effect of CBL in higher education and intercultural competence development through a longitudinal study. A longitudinal study will provide the possibility to apply the theoretical models differently while analysing long-term effects and the process of intercultural competence development. Finally, exploring the effects of multidisciplinary, interdisciplinary or transdisciplinary approaches in higher education in relation to intercultural competence development would be insightful. Future studies could explore how working across the borders of different disciplines and thus different perspectives, could contribute to intercultural competence.

Conclusion

This thesis aimed to investigate the question "how do the outcomes of CBL in higher education align with intercultural competence development models"? By conducting a qualitative systematic literature review and thematic analysis, it was found that CBL aligns with two out of three models of intercultural competence development. Limited alignment was found with Bennett's Developmental Model of Intercultural Sensitivity (1986), due to the scope of the research not being large enough to yield results for all different stages of the model. However, it was found that CBL aligns better with the Developmental Model of Intercultural Maturity by King and Baxter Magolda (2005), having found relevant information related to all three dimensions of this model, partly due to the model's focus on intercultural competence development in higher education. The best alignment of CBL was found with the Deardorff's Process Model of Intercultural Competence (2006, 2008), where learning outcomes were assigned to different aspects of this developmental model. Based on these findings, it can be concluded that CBL does align with certain theoretical models of intercultural competence development. Moreover, CBL may positively influence intercultural competence development in higher education.

The findings of this thesis contribute to research in higher education and intercultural competence development among students, especially for students following a CBL course or programme. It adds to the growing body of literature of CBL in higher education and showcases that CBL can contribute to intercultural competence development, even outside of intercultural contexts. Additionally, the findings of this thesis also offer practical insights for practitioners and facilitators of CBL experiences in higher education, especially when this takes place in an international context.

To conclude, by connecting theoretical intercultural competence development models to learning outcomes of CBL experiences of higher education students, this thesis showed that students participating in CBL education can develop intercultural competence. It also pointed out the need for future research into this topic to gain a deeper understanding of CBL in an intercultural context and the overall effect of CBL on intercultural competence development. These findings are important in teaching students how to navigate a diverse and increasingly

complex world. As Deardorff (2009) notes “[i]n the end, intercultural competence is about our relationships with each other, and, ultimately, our very survival as the human race, as we work together to address the global challenges that confront us” (p. 269).

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Appendices

Appendix 1. Search strings

Search string number	Search string
Search string 1	(“challenge based learning” OR “challenge-based learning” OR CBL) AND (“tertiary education” OR “higher education” OR universit* OR HEI OR (bachelor OR undergraduate) OR (master OR graduate) OR student* OR learn*)
Search string 1a	(“challenge based learning” OR “challenge-based learning” OR CBL) AND (“tertiary education” OR “higher education” OR universit* OR HEI OR (bachelor OR undergraduate) OR (master OR graduate) OR student* OR learn*) NOT ("case based learning" OR "case-based learning")
Search string 1b	((“challenge based learning” OR “challenge-based learning” OR CBL) AND (“tertiary education” OR “higher education” OR universit* OR HEI OR (bachelor OR undergraduate) OR (master OR graduate) OR student* OR learn*) NOT ("case based learning" OR "case-based learning" OR "collaborative-based learning" OR "collaborative learning" OR "computer based learning" OR "computer-based learning" OR "context based learning" OR "context-based learning" OR "clinic-based learning" OR "clinic based learning" OR "community based learning" OR "community-based learning" OR "content based learning" OR "content-based learning))
Search string 2	(“challenge based learning” OR “challenge-based learning” OR CBL) AND (“tertiary education” OR “higher education” OR universit* OR HEI OR (bachelor OR undergraduate) OR (master OR graduate) OR student* OR learn*) AND (“intercultural competenc*” OR “cultural competenc*” OR intercultural skills” OR “intercultural sensitivity” OR “intercultural maturity” OR “cross-cultural competenc*) NOT ("case based learning" OR "case-based

learning" OR "collaborative-based learning" OR "collaborative learning" OR "computer based learning" OR "computer-based learning" OR "context based learning" OR "context-based learning" OR "clinic-based learning" OR "clinic based learning" OR "community based learning" OR "community-based learning" OR "content based learning" OR "content-based learning")

Appendix 2. Codebook

Table 1.

Theme: Developmental Model of Intercultural Sensitivity (Bennett, 1986)

Subtheme	Description	# Extracts	# Articles	Illustrative code
Denial	Someone sees their own culture and values as then only relevant one (Bennett, 1986).	0	0	Not applicable
Defense	Someone acknowledges other cultures, but sees them as a threat to their own (Bennett, 1986).	0	0	Not applicable
Minimization	Someone tolerates other cultures, but sees their own culture as more important (Benett, 1986)	0	0	Not applicable
Acceptance	Someone acknowledges and accepts cultural differences such as behaviour and values (Bennett, 1986).	19	9	“Interdisciplinary teamwork stimulated students to gain insight in the value of their own discipline and to be more appreciative toward other scientific disciplines” (Sluijs et al., 2024, p. 4166)
Adaptation	Someone goes out of their own cultural comfort zone to interact	14	9	“The students who answered yes highlighted the interdisciplinary nature of translational work, emphasizing the need to engage with professionals from diverse fields and

	with others with different cultural backgrounds (Bennett, 1986).			adapt to their needs in order to foster effective collaboration" (Kools et al., 2024, p.10)
Integration	Someone integrates other cultural values into their own identity (Bennett, 1986)	0	0	Not applicable

Table 2.

Theme: Developmental Model of Intercultural Maturity (King & Baxter Magolda, 2005)

Subtheme	Code	Description	# Extracts	# Articles	Illustrative code
Cognitive dimension	Perspective taking	At a mature development level, someone is able to shift between different cultural perspectives (King & Baxter Magolda, 2005)	18	9	"For instance, Student A indicated that he increased his awareness of the importance of including different perspectives when taking decisions with the team's board" (Bravo et al., 2024, pp. 347-348).
	Using cultural frames	At a mature level of development, someone is able to understand multiple cultural frames and can navigate between them (King & Baxter Magolda, 2005)	0	0	Not applicable
Intrapersonal dimension	Challenging views	At a mature level of development, someone is able	6	3	"Others put forward the perspective that specific knowledge is valuable in developing new

		to challenge their own views during intercultural interactions (King & Baxter Magolda, 2005)			knowledge across disciplines: I never thought one could think of a system in so many different ways. I have learned a lot related to my own area just by working together closely with someone who had a different perspective" (Student 15) (Rådberg et al., 2020, p. 31)
	Self-awareness	At a mature level of development, someone displays understanding of their own cultural identity (King & Baxter Magolda, 2005)	5	5	"Interdisciplinary teamwork stimulated students to gain insight in the value of their own discipline and to be more appreciative toward other scientific disciplines" (Sluijs et al., 2024, p. 4166)
Interpersonal dimension	Appreciating differences	At a mature level of development, someone can understand and appreciate different perspectives (King & Baxter Magolda, 2005)	13	7	"Regarding collaboration, students became aware of the importance of peer feedback and each other's perspective: "I became more inclined to seek peer feedback and became aware of the importance of others' different perspectives. And also that you can be useful to other groups."" (Valentijn et al., 2023, p. 204).
	Respectful interactions	At a mature level of development, someone shows respect for different perspectives, while staying true to their own beliefs in interactions (King & Baxter Magolda, 2005)	20	10	"students were able to develop sustainability competencies and skills to communicate effectively through online interaction with people from different cultures and disciplines, showing pride in their national identity and respect for the richness and characteristics of other cultures and the use of technological tools that facilitate communication

and distance learning in multicultural virtual environments" (Membrillo-Hernández, 2023, p. 19)

Table 3.

Theme: Process Model of Intercultural Competence (Deardorff, 2006, 2008)

Subtheme	Code	Description	# Extracts	# Articles	Illustrative code
Attitudes	Respect	Someone values other cultures and treats them with respect. (Deardorff, 2008)	5	3	"Thus, with respect to the competence "4. Analysis, understanding and solving complex problems", a group claims not to have developed it because of the type of problem and the time to solve it. The groups that claim to have developed it relate to the methodology used, the communication and respect between participants" (Gil-Molina et al., 2024, p.13)
	Openness	Someone withholds judgement during interactions with others (Deardorff, 2008)	15	8	"'Communication' emerged as a facilitator of multidisciplinary teamwork. Multiple instances in the video transcripts demonstrated how the students comfortably expressed their ideas, listened, asked questions, and provided suggestions" (Mesutoglu et al., 2024, 648)
	Curiosity & Discovery	Someone is able to tolerate ambiguity in interactions and can	9	4	"Experiential learning at the beginning of undergraduate engineering studies proved to be, at least in this study, a trigger for students' curiosity

		show curiosity towards others (Deardorff, 2008).			and rapid acquisition of skills such as critical thinking, collaborative work, complex reasoning, and problem-solving" (Lara-Prieto et al., 2023, p. 274)
Knowledge & comprehension	Cultural self-awareness	Someone has a deep understanding of their own culture (Deardorff, 2008)	5	3	"students mentioned becoming more aware of their own discipline in interdisciplinary collaboration, appreciating their own discipline better, and learning what they could contribute to interdisciplinary problem-solving" (Sluijs et al., 2024, p. 4169)
	Deep cultural knowledge	Someone has a deep cultural knowledge of other cultures and their own (Deardorff, 2008)	0	0	Not applicable
	Sociolinguistic awareness	Someone is aware of sociolinguistics of their own culture and other cultures (Deardorff, 2008)	1	1	"Finally, this difference between the perceptions of the different groups also occurs in relation to competence "10.Multilingualism: dealing with a multilingual language repertoire". [...] Those who claim to have developed it, point to linguistic diversity as a factor, as well as the conceptualisation of this diversity as an asset and the work carried out by interpreters: "The fluent leap of languages is encouraged, seeing richness in it." (Challenge 3);"We have been able to communicate thanks to the interpreters."

					(Challenge 5)" (Gil-Molina et al., 2024, pp. 14-15)
Skills	To listen, observe & evaluate	Someone shows communication skills, including listening, observing and evaluating (Deardorff, 2008).	16	10	"'Enhanced my ability to listen actively and show empathy when collaborating with others', received the highest rate of strong agreement, with 67%" (Hitt et al., 2025, p. 12)
	To analyze, interpret & relate	Someone shows cognitive skills, including analyzing, interpreting and relating to information (Deardorff, 2008).	11	6	"Experiential learning at the beginning of undergraduate engineering studies proved to be, at least in this study, a trigger for students' curiosity and rapid acquisition of skills such as critical thinking, collaborative work, complex reasoning, and problem-solving" (Lara-Prieto et al., 2023, p. 274)
Internal outcome	Adaptability	Someone shows a shift in their frame of reference by being able to adapt between different cultures (Deardorff, 2008)	17	9	"For instance, Student A indicated that he increased his awareness of the importance of including different perspectives when taking decisions with the team's board" (Bravo et al., 2024, p. 347-348)
	Flexibility	Someone shows a shift in their frame of reference by being able to flexibly shift between	9	6	"One focus group even mentioned the importance of learning to deal with the heterogeneity of the team" (Morselli & Orzes, 2023, p. 6)

		behaviour and worldviews			
	Ethnorelative view	Someone shows a deep cultural understanding and knowledge (Deardorff, 2008)	1	1	“Us students representing different educational backgrounds, coming from many different countries and working with stakeholders from industry, academia and government, it took some time and a lot of frustration to understand how to navigate. I think we found a way where we discussed a lot to make sense of, for instance, the meaning of ‘sustainability’ or ‘system’”(Student 7) (Rådberg et al., 2020, p. 32)
	Empathy	Someone shows empathy for different cultures and tries to understand different perspectives (Deardorff, 2008)	5	1	“In our research on the Da Vinci Project we learned that transdisciplinary CBL combined with design thinking is an adequate pedagogical framework to facilitate growth of sustainability change-maker competencies, such as empathy, creativity, collaborative teamwork, stakeholder engagement, and integrative problem-solving” (Sluijs et al., 2024, p. 4170)
External outcome	Effective and appropriate behaviour	Someone shows effective and appropriate behaviour in intercultural situations (Deardorff, 2008)	9	5	“Our findings suggest that students attributed their success (of lack of) to several soft skills—namely, teamwork, planning, time management, task delegation and communication, particularly during the early stages of group work” (Vilalta-Perdomo et al., 2022, p. 13)

	Effective and appropriate communication	Someone shows effective and appropriate communication in intercultural situations (Deardorff, 2008)	40	12	"'Communication' emerged as a facilitator of multidisciplinary teamwork. Multiple instances in the video transcripts demonstrated how the students comfortably expressed their ideas, listened, asked questions, and provided suggestions" (Mesutoglu et al., 2024, p. 648).

Table 4.

Inductive themes and CBL characteristics

Theme	Description	# Extracts	# Articles	Illustrative code
Barriers or challenges	Identified barriers and challenges to collaboration or intercultural competence development	13	7	"They initially expressed stress and discomfort in asking others to take on responsibilities during their capstone projects, considering the numerous tasks that needed to be completed" (Kools et al., 2024, p. 11)
CBL mix	Indicates if CBL has been used in combination with another pedagogical approach	4	2	"Our article discussed how the VEC, an IaH, experiential learning, LSP teaching and learning project could be an ideal example of an LSP learning environment despite the limitations in the project and study" (Moore et al., 2023, p. 17).

International context	Indicates if research was conducted in an international context.	6	4	“Altogether, as of writing, 281 students from Europe, Africa, and North America took part in the VEC in either English, French, or French Sign Language (LSF)” (Moore et al., 2023, p. 3).
Multidisciplinarity or interdisciplinarity	Indicates if students collaborated in multidisciplinary or interdisciplinary teams	37	14	“Interdisciplinarity characterized the program design, student selection, methods, assessment, and outputs” (De Stefani & Han, 2022, p. 10).
Transdisciplinarity	Indicates if students collaborated transdisciplinary	22	11	“These students challenge themselves to tackle some of the world’s complex challenges, working together with external companies and organisations” (Bravo et al., 2024, p. 344).

DEPARTMENT OF PEDAGOGICAL CURRICULAR AND PROFESSIONAL STUDIES

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