

Design thinking for interdisciplinary learning and global competence in higher education: an integrative framework

Asrif Yusoff

Abstract

Purpose – Global competence (GC) is becoming an increasingly important requirement for graduates of higher education (HE) institutions, as it helps them to be better prepared in overcoming the challenges and complexities of an interconnected world. As this requirement becomes more prevalent, this study aims to address the challenges of GC education within HE settings by proposing a conceptual framework that integrates design thinking (DT) with interdisciplinary learning (IL). This effort seeks to bridge existing opportunities within the literature and inculcate inclusive and scalable pedagogical strategies.

Design/methodology/approach – An integrative literature review (ILR) of 59 peer-reviewed studies was conducted based on existing literature related to GC, IL and DT. The framework is grounded in two established educational theories: the Intercultural Competence Model and Constructivist Learning Theory, given their alignment with the promotion of empathy, collaboration and creativity within DT.

Findings – The review confirms that while IL enhances GC, significant barriers persist in curriculum integration and effective assessment. To address this challenge, DT offers a practical and iterative methodology to support IL by fostering empathy, collaboration and experiential learning. The proposed “Integrative Framework of Design Thinking for Interdisciplinary Global Competence” aligns each stage of the DT process (i.e. empathise, define, ideate, prototype, test) with the developmental components of GC.

Originality/value – This study offers a framework that positions DT as both a pedagogical method and strategic approach for advancing interdisciplinary GC across all levels of the HE ecosystem (i.e. module design, curriculum structure, institutional policy). This proposal is intended for further empirical examination, as its conceptual and non-empirical nature is duly acknowledged.

Keywords Global competence, Interdisciplinary learning, Design thinking, Higher education, Intercultural competence model, Constructivist learning theory

Paper type Conceptual paper

Asrif Yusoff is based at Greenwich Business School, University of Greenwich, London, UK.

Received 20 April 2025
Revised 21 July 2025
18 September 2025
25 October 2025
Accepted 25 October 2025

Introduction

The call for university students to be equipped with global competence (GC) is growing urgent as graduates enter an increasingly interconnected world. GC refers to the capacity for individuals to understand global issues, appreciate diverse perspectives and interact effectively across cultures (Deardorff, 2006; OECD, 2018). However, recent reviews of the literature have pointed to significant limitations in current practice. These include the absence of standardised tools to assess effectiveness of GC development (Jiaxin et al., 2024), a lack of conceptual clarity and structured educational frameworks (Richter and Kjellgren, 2024) and limited research on effective implementation strategies (Islam and Stamp, 2020). Moreover, there is a strong reliance on the relatively exclusive international experiential learning programmes as the primary vehicle for GC education among students. This approach remains inaccessible to many students due to financial or structural barriers within higher education

© Asrif Yusoff. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licenses/by/4.0/>

Conflict of interest: The author declares no conflicts of interest.

(HE) (Cao and Meng, 2020; Sofyan *et al.*, 2025). Such a scenario creates an equity gap whereby students from privileged backgrounds are more likely to benefit from GC experiences when compared with less privileged peers (Teng and Cosier, 2024). These disparities highlight the need for inclusive strategies that democratise GC education and widen access to a broader audience (Cobb and Couch, 2022; Majewska, 2023).

To address the challenges of effective GC development within HE settings, interdisciplinary learning (IL) is a promising pathway as it offers opportunities for students to synthesise knowledge across different fields and engage with real-world challenges (Islam and Stamp, 2020; Songer and Breitzkreuz, 2022). Foundational scholarship on interdisciplinarity positions IL as the intentional integration of insights and methods across domains to tackle complex problems (Klein, 1993; Repko and Szostak, 2017). One example sits within science, technology, engineering, and mathematics (STEM) disciplines where there is a growing emphasis on integrating social sciences into the curriculum to better prepare graduates amidst evolving global demands (Yamada, 2018). This takes the form of module integration, cross-departmental enrolment, and intercultural learning within pedagogical activities (Smith and Paracka, 2018). While there are forthcoming efforts, the field still lacks clarity on how IL can be scaled successfully using robust pedagogical methods to serve an increasingly diverse student population (Chandra *et al.*, 2025; Mokski *et al.*, 2022).

Given the growing need to advance GC and the promise of IL to meet this demand, design thinking (DT) provides a practical approach to address this gap. Originally developed for product development and innovation (Brenner and Uebernickel, 2016; Liu and Lu, 2020; Vendraminelli *et al.*, 2023), DT is a human-centred and iterative approach that promotes empathy, collaboration and creativity (Du *et al.*, 2012; Henriksen *et al.*, 2017). Recent studies show that DT can enhance problem-solving abilities and workplace readiness of students (Guaman-Quintanilla *et al.*, 2023; McLaughlin *et al.*, 2022; Tsai *et al.*, 2023). However, the role of DT in supporting IL for GC development remains underexplored, especially when grounded in educational theory. Existing models for GC education in HE mainly focus on structural strategies and leadership outcomes (Bilderback and Thompson, 2025; Songer and Breitzkreuz, 2022). This situation signals an opportunity to explore and consider pedagogical tools like DT which can be applied at the classroom and institutional levels. Therefore, this study is guided by two research questions built upon opportunities identified within the literature:

RQ1. How does IL contribute to GC in HE?

RQ2. What role can DT play in fostering IL for GC?

This study contributes to the literature by proposing a conceptual framework that integrates DT with two established concepts: intercultural competence model (ICM) and constructivist learning theory (CLT). The proposed framework strengthens the existing models in two ways. Firstly, it clarifies the learning mechanism with CLT by showing how competencies can be developed through social interaction and active construction of knowledge in collaborative design work. Secondly, it looks beyond the classroom to explore institutional conditions that enable GC to scale more efficiently. These features make the framework a practical bridge between theory and practice. Drawing on 59 peer-reviewed studies, the proposed framework offers a model that is grounded on theory and supports curriculum innovation and inclusive learning design. This framing also aligns with UNESCO's calls for education that advances global citizenship and intercultural aims (UNESCO, 2015, 2021).

Theoretical framework

This study is grounded in two complementary frameworks: ICM (Deardorff, 2006; Deardorff and Arasaratnam-Smith, 2017) and CLT (Piaget, 1950; Vygotsky, 1980). These frameworks

were chosen because they align with the foundations of GC specifically empathy and collaboration, and are well suited to iterative approaches such as DT. These frameworks also help to explain how GC can be cultivated through mindset shifts in intercultural behaviours and structured learning (Smith and Paracka, 2018). This connection is especially relevant to DT as it encourages learners to be human-centred and engage with diverse perspectives within the classroom and beyond (Guaman-Quintanilla *et al.*, 2023; McLaughlin *et al.*, 2022).

The ICM views intercultural competence as a cyclical process starting with attitudes (e.g. openness, respect), progressing to knowledge and skills, and leading to internal outcomes (e.g. empathy, adaptability) that translate into appropriate behaviours (Deardorff, 2006; Deardorff and Arasaratnam-Smith, 2017). This model aligns well with DT's emphasis on empathy and iteration (Hantsiuk *et al.*, 2021; Lee *et al.*, 2020; Micheli *et al.*, 2019) which are qualities required for meaningful intercultural engagement (Smith and Paracka, 2018; Sofyan *et al.*, 2025). Through activities embedded within a DT process (e.g. observation, interviews, immersion), students are empowered to develop curiosity and openness (Choi *et al.*, 2024; Dykhnych *et al.*, 2022). With these competencies, students would be able to nurture the ability to understand global systems (Bilderback and Thompson, 2025). In the context of this study, DT is positioned as a tool to develop practical skills and enable a reflective learning process that supports sustained GC development in the long term.

In complementing ICM, CLT explains how learners build knowledge through active and social experiences. The CLT framework suggests that knowledge or skill acquisition is constructed when learners engage with real-world problems and interact meaningfully with others (Chuang, 2021; Thomas *et al.*, 2014). From this perspective, learning involves the active absorption of facts which is also shaped by prior experiences (Chuang, 2021; Ledoux and McHenry, 2004). In the context of HE, CLT is relevant to GC education as it supports learning environments where students collaborate across disciplines and cultures. Recent studies have highlighted the importance of structured approaches in teaching GC whether through competency-based education models (Majewska, 2023) or practice-oriented pedagogical strategies (Ramos *et al.*, 2021). This emphasis on experiential learning aligns directly with DT's iterative process which encourages experimentation and prototyping (Pande and Bharathi, 2020). Further, recent advances in prototyping within the literature have shown how the design processes can deepen student empathy (Lee and Park, 2021), and dynamically shape the way students think (Verganti *et al.*, 2021).

In practice, a learning process anchored on CLT empowers students by giving them autonomy to choose how they learn, which strengthens their problem-solving capabilities (Chuang, 2021). This approach also encourages interdisciplinary thinking as learners are prompted to connect ideas across different fields which would force them to broaden their knowledge base and outlook (Brassler and Dettmers, 2017; Chandra *et al.*, 2025). In this regard, ICM and CLT provide a coherent foundation for this study as they highlight the outcomes associated with GC and guide the design of learning environments that can facilitate the desired goals. When combined with DT, these frameworks promise a practical way to structure IL and GC development that is inclusive and scalable across HE.

Methodology

To answer the research questions, this study adopts an integrative literature review (ILR) approach. An ILR was chosen because it enables synthesis across diverse theoretical frameworks and empirical approaches (Torraco, 2005; Whittemore and Knafl, 2005). This method is especially appropriate for addressing continuously evolving topics within the interests of this study (Whittemore and Knafl, 2005). Unlike other types of reviews, ILR facilitates the integration and interpretation of existing literature to generate new insights and inform future research (Snyder, 2019). In doing this, a strategic literature search was conducted to ensure comprehensiveness and transparency of selection. The relevant

literature was sourced from key academic databases, namely, Scopus, Web of Science and Google Scholar using keyword combinations such as “global competence”, “intercultural competence”, “interdisciplinary learning”, “design thinking”, “human-centred design”, “experiential learning”, “innovative pedagogy” and “higher education”.

From this process, the search results were then restricted to peer-reviewed journal articles published within the past decade, between 2014 and 2025 to ensure relevance and recency. The selection of the decade leading to the present year was to capture changes that have taken place before and after the COVID-19 pandemic, which has significantly shaped the HE sector globally. Foundational works predating 2014 were cited for theoretical grounding only and were not counted within the review literature. Further, clear inclusion and exclusion criteria were established to determine the suitability of sources. Inclusion criteria were articles published from 2014 to 2025, peer-reviewed articles, and relevant content to GC, IL and design thinking (DT). Both empirical research and theoretical papers were included to ensure a comprehensive review, and articles that fell outside these criteria were excluded to ensure relevance. The initial search of the relevant literature returned 68 records. After removing duplicates and conducting further filtering via the inclusion and exclusion criteria, a total of 59 studies were included in the final review. A table outlining the inclusion and exclusion criteria and a PRISMA flow diagram presenting the document selection are included in [Appendix 1](#) and [2](#).

Further to literature search and identification, four activities were undertaken. These include evaluation of data from the selected studies, extraction of relevant information, analysis of patterns that are categorised into themes and development of conceptual framework. Details of these activities are as follows:

1. *Data evaluation*: Each article was critically evaluated for methodological rigour, relevance and significance of findings ([Torraco, 2016](#)). Only studies that met these criteria were included in the final analysis. The appraisal considered clarity of research questions, appropriateness of methods and credibility of evidence, as well as stated limitations.
2. *Data extraction*: Key information from each article (i.e. authors, research method, key findings) was recorded in a structured matrix. This helped to organise the literature and allowed easier identification of common themes and gaps. Some additional fields were also captured including context, setting, participant characteristic and instrument used, to support comparative synthesis.
3. *Data analysis*: Thematic analysis was used to identify patterns across the selected studies. This method enabled review across different source types and helped to explain how they relate ([Braun and Clarke, 2021](#)). It also allowed flexibility when analysing a broad range of ideas. This analysis followed a reflexive thematic approach in three cycles: initial coding of all texts into the extraction matrix; deductive mapping to ICM and DT elements to ensure theoretical alignment; and inductive refinement to develop cross-cutting themes. The process also involved reading and coding articles in several iterations to identify key themes in three main areas: best practices for developing GC and IL in HE; effective strategies and impending challenges; and how DT is used in universities.
4. *Conceptual framework development*: The final step of the ILR review was to develop a conceptual framework using the key themes identified. This involved gathering the main findings from the literature to create a structured model that explains their relationships and possible applications.

This study is a conceptual synthesis based on an integrative review of existing literature and presents no primary empirical data.

Findings

Understanding global competence

GC is increasingly seen as an essential part of HE which reflects the complex mix of skills expected of students today (Majewska, 2023; Richter and Kjellgren, 2024; Teng and Cosier, 2024). At its core, GC is about students being able to interact effectively across cultures by demonstrating the right attitudes, knowledge and skills (Deardorff, 2006). While Deardorff's (2006) model focuses on the intercultural aspects of GC, this study takes a broader view. It includes the ability to engage with global challenges and systems as emphasised by the Organisation for Economic Co-operation and Development (OECD). GC has been integrated into key frameworks such as the OECD Programme for International Student Assessment (PISA), which highlights the importance of preparing students to deal with global issues (OECD, 2019). As this framework gained momentum, recent critiques stressed the need for careful interpretation and warned against overgeneralisation when it is applied (Bailey *et al.*, 2023; Engel *et al.*, 2019).

Specifically, a growing number of scholars have raised concerns about the way the OECD's GC framework has been used in PISA, especially on its real-world impact. Research has shown that the assessment may be biased and potentially disadvantaging certain groups of students depending on their socio-economic background (Aydogan and Tat, 2025). This is further compounded by criticisms that the framework sidelined perspectives from the Global South while promoting a dominant Western view (Grotlüschen, 2018). These concerns have led to real consequences such as the decision by Germany not to take part in the GC assessment due to concerns on measurement reliability (Sälzer and Roczen, 2018). Critics also argued that the focus of GC frameworks on vague global citizenship goals can distract from tackling deeper issues like structural inequality (Engel *et al.*, 2019; Jooste and Heleta, 2017). The OECD's design of GC is also said to be driven by economic priorities rather than humanitarian values (Auld and Morris, 2019). These critiques point to the need to continuously refine and rethink how GC is defined and applied across different education systems.

Despite the prevalence of GC development in HE and strong interest from both proponents and critics, significant opportunities for further research arise. Teaching GC effectively remains a challenge with ongoing efforts needed to enhance instructional approaches (Majewska, 2023). In relation to teaching methods, while the definition of GC and its components is becoming more refined, there is still a lack of standardised tools to assess its development among students and faculty (Jiaxin *et al.*, 2024). Current strategies deployed by HE institutions include intercultural collaboration, mobility programmes and virtual engagements (Richter and Kjellgren, 2024), but their impact is often limited by the suggested absence of reliable assessment (Jiaxin *et al.*, 2024; Majewska, 2023). Recent studies stressed the importance of such tools to help align curriculum design and scale up successful GC initiatives (Crawford *et al.*, 2020; Li, 2013). These gaps point to the urgent need for inclusive and accessible teaching approaches that support the development of GC more systematically, which presents an opportunity for the consideration of IL and DT.

The role and impact of interdisciplinary learning in higher education

IL has emerged as an effective approach for developing GC within HE as it encourages the integration of perspectives and knowledge from diverse fields (Islam and Stamp, 2020; Ngoc and Bin, 2025; Songer and Breitzkreuz, 2022). STEM graduates in the USA effectively develop GC through interdisciplinary general education courses and study abroad programmes as these experiences significantly relate to their capabilities and potential (Yamada, 2023). The integration of intercultural competencies into the core curricula of HE is also deemed to be critical (Islam and Stamp, 2020). IL is seen as a shift from traditional

models as it can significantly help students adapt to international settings, with collaboration and innovation being key enablers (Bilderback and Thompson, 2025). These insights highlight the growing use of IL in preparing well-rounded graduates as they prepare themselves to enter the workforce (Hains-Wesson and Ji, 2020; Striolo *et al.*, 2023). It has also now become a necessity for students to not only master the subjects that they majored in during their studies but also understand how they are able to enable impact as future leaders (Costa *et al.*, 2019; Oudenampsen *et al.*, 2023).

While the benefits are clear, IL approaches face significant institutional and practical barriers. Communication difficulties, disagreements across subjects and differences in expectations are hindering the full potential of IL (Brassler and Dettmers, 2017). Low motivation or limited prior experience among students may cause the IL experience to make minimal impact when compared to a more focused single-discipline programmes (Xu *et al.*, 2022). Thus, clear institutional strategies, comprehensive training and stakeholder assessment are some of the mitigations that can be proactively taken to address such challenges (Kjellgren and Richter, 2021). In this regard, recent efforts include globalised learning experiences and professional development opportunities for educators as initiatives to equip students effectively across all levels (Dimitrieska, 2023). These efforts signal the potential and opportunity for effective mitigation although the challenges of IL can hamper trust or motivation across learning ecosystems.

Application of design thinking in higher education

Originally developed within the fields of innovation and product design, DT has gained substantial traction within HE as an effective methodology to foster interdisciplinary collaboration and enhance student outcomes (Guaman-Quintanilla *et al.*, 2023; McLaughlin *et al.*, 2022; Wang, 2024). The roots of DT span across design cognition and reflective practice, and its relevance to complex problem-solving is widely discussed within the literature (Cross, 2006; Dorst, 2015; Lawson, 2010). Given that DT puts focus on the user within a specific design process, any solution that is put forth requires thorough assessment of different interdependencies and influencing factors; an approach comparable to systems thinking in that considers interdependencies (Buchanan, 2019). As an iterative process, DT consists of five distinct stages: empathise, define, ideate, prototype and test (Deitte and Omary, 2019; Lee and Park, 2021). This process takes different shapes and forms, depending on the institution in which DT is being applied. The pioneers in promoting the upskilling and application of DT include IDEO, Stanford d.school and the LUMA Institute which have played an important role in commercial product design and also public policy development over the years. When applied across HE domains, the inclusive and flexible framework of DT encourages students to approach problems creatively and iteratively refine solutions based on continuous feedback (Choi *et al.*, 2024; Dykhnych *et al.*, 2022).

From the review conducted on the literature of GC and IL implementation in HE, educators face significant barriers to creativity including time constraints, high expectations and risk aversion (Henriksen *et al.*, 2017). These are areas that DT can potentially overcome as progress is done in an iterative manner and expectations are managed proactively as stakeholders are kept informed (Hendricks *et al.*, 2018; Redante *et al.*, 2019; Verganti *et al.*, 2021). Further, DT is an inclusive process that welcomes diverse ideas that would then be integrated collaboratively and fairly; an exercise that can also be supported by applied artificial intelligence (McGowan, 2019; Sreenivasan and Suresh, 2024). As an enabler of IL, DT can also provide a structured approach to bridge arts and sciences and enable educators to integrate interdisciplinary lessons (Henriksen, 2017). Through its analytical and creative approach, the incorporation of DT into HE can significantly enhance students' problem-solving skills (Alvarado, 2025; Guaman-Quintanilla *et al.*, 2023).

Discussion

Proposed framework of integrating design thinking and interdisciplinary learning for global competence

This study proposes a practical framework which integrates DT to support IL and GC development for students in HE. This framework is built on insights from the ILR conducted and draws on two key theories: the ICM and CLT. The framework responds to challenges identified from the literature around vague definitions, lack of clear teaching strategies and limited integration of GC in university courses. Therefore, the integration of DT into IL and GC development offers specific actions for educators and universities. Specifically, the five stages of DT (i.e. empathise, define, ideate, prototype, test) match well with how ICM describes the growth of GC starting from developing the right attitudes, building knowledge and skills, and applying them internally and externally. DT also aligns with CLT by emphasising active real-world learning. Table 1 shows how each DT stage can be adapted to help students build GC across disciplines.

Applying design thinking in university settings

To effectively leverage DT for interdisciplinary GC, universities must embed it systematically across multiple levels via teaching methods, curriculum design and institutional strategies. In teaching, DT can be used through project-based learning where students work together on global issues (e.g. climate change, public health) by drawing on different academic fields such as engineering, business and the humanities (Cummings and Yur-Austin, 2022; Jiang and Pang, 2023). The DT process helps students approach problems in steps which encourage them to learn from others and refine their ideas. This is a method that fits well with the CLT, which values social and active learning. Additionally, other DT-inspired teaching methods include case competitions and role-playing activities which allow students to immerse themselves in real-world situations or simulations (Huq and Gilbert, 2017; Sheehan et al., 2018). The iterative nature of DT allows students to apply knowledge in practical ways, reflect on it and improve themselves towards deeper learning (Marks and Chase, 2019).

In practice, the framework can be delivered as a simple stage sequence based on the DT process (i.e. empathise, define, ideate, prototype, test) with brief assessment touchpoints at each stage to evidence GC development. Examples include a short attitude reflection (empathise), a problem-framing exercise (define), an idea portfolio with selection rationale (ideate), a prototype review (prototype) and stakeholder feedback with action plans (test). Assessments built around DT phases like prototyping and testing allow for ongoing feedback which can support personal growth among students (Blundell, 2024; Whelan et al., 2024). This spirit of developing well-rounded individuals aligns strongly with both the frameworks of ICM and CLT.

Table 1 Contextualising design thinking stages to interdisciplinary global competence	
Design thinking stage	Contextualisation to interdisciplinary global competence
Empathise	Interviews, observations, immersion; build openness, respect, curiosity (ICM: attitudes; CLT: social interaction, perspective-taking)
Define	Synthesise insights; frame shared problem (ICM: knowledge structures; CLT: scaffolding)
Ideate	Intercultural dialogue; co-create ideas across fields (ICM: analysis, creativity; CLT: active knowledge construction)
Prototype	Develop storyboard, create prototype; build confidence (ICM: internal outcomes, self-efficacy; CLT: experiential learning)
Test	Pilot with stakeholders; reflect and iterate (ICM: external outcomes, intercultural behaviour; CLT: feedback)
Source(s): Author's own work	

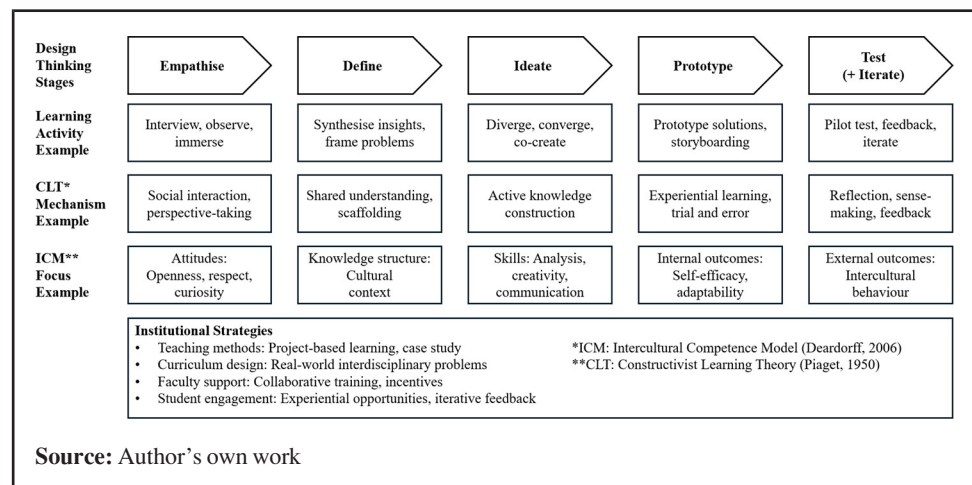
At the institutional level, universities can support DT by offering faculty training, collaborative workshops and course design opportunities (Levy, 2017; McLaughlin *et al.*, 2022; Xu *et al.*, 2018). HE institutions can also provide incentives such as scholarships and research grants to encourage global and interdisciplinary DT projects among students and staff (Kjellgren, 2024; Kjellgren and Richter, 2021). Additionally, assessment tools should reflect DT's iterative nature to clearly measure GC outcomes, an area identified as lacking in past research. To illustrate these processes, the “Integrative Framework of Design Thinking for Interdisciplinary Global Competence” is illustrated in Figure 1. The framework presents how each stage of the DT process aligns with the key elements of ICM and CLT, and deepens the understanding of how GC can be developed by focusing on hands-on learning, reflection and institutional support. When DT is fully integrated into HE systems, it promises a clear and structured way to help students become globally competent through practical and interdisciplinary development experiences.

Implications

Theoretical implications. For research, the proposed framework provides a testable proposition which links the DT process to intercultural outcomes. For example, the integration of “empathising” with “perspective-taking” and “pilot testing” with “intercultural behaviour”. This presents opportunities for further research which are discussed in the next section. For practice, the proposed framework can be used as the basis for the design of modules or programmes, mainly if the objective is to incorporate clear intercultural goals among students. To enable this adaptation, however, adjacent changes need to also happen including revision of assessment rubrics to be more reflective, upskilling of staff capability (e.g. DT facilitation, intercultural dialogue) and platforms for cross-disciplinary ideation at faculty or departmental level. Therefore, support for senior management or leadership is critical as key enablers.

Practical implications. For policymaking in HE, the framework provides a case for interdisciplinary project work to be a requirement for project approval. This implementation needs to be carefully carried out, however, so that any interdisciplinary integration is done with strategic purpose and not merely for requirement's sake. For society, the framework holds potential of supporting employability and civic readiness in the way it develops graduates who are able to frame problems across differences, while co-creating solutions. There are also opportunities for intercultural cohesion through structured dialogue and collaborative design with internal and external partners. Ultimately, the framework is an

Figure 1 Integrative framework of design thinking for interdisciplinary global competence



enabler for lifelong learning pathways as it inculcates transferable skills that are practical beyond university level (e.g. problem framing, prototyping, ethics).

Limitations and considerations for future research

As a conceptual and non-empirical study, the proposed framework has not been statistically or experimentally validated. Therefore, it needs to be acknowledged that the literature identified may reflect selection and language bias and focuses on HE contexts. While indicative measures are proposed, their validity and reliability remain to be established until further empirical analysis. In this regard, future research should conduct evaluations of the framework in diverse institutional settings (i.e. public or private sector, selected regional setting), compare outcomes against alternative pedagogical approaches and examine longitudinal impacts on intercultural behaviours and graduate outcomes.

Conclusion

This study examined the role of DT as a mechanism to foster IL in the development of GC in HE. Grounded in the ICM and CLT, the proposed framework offers an iterative process that facilitates the integration of diverse knowledge domains. It also embeds real-world experiences which are critical to GC development and behavioural transfer.

The ILR conducted confirms that IL is essential for cultivating GC, yet ongoing challenges remain in translating this into practice. These include persistent silos across faculties and rigid assessment structures within HE institutions. With the incorporation of DT across curricular and co-curricular activities, HE institutions can equip students with practical competencies including collaborative problem-solving, intercultural awareness and creative thinking. These competencies matter for employability and civic readiness in diverse workplaces. Through further assessment in real-world contexts, it can be ascertained how the framework can be scaled beyond single modules towards programme level adoption through aligned assessment and faculty upskilling.

The key recommendations from this study include the systematic integration of DT into teaching practices, curriculum structures and assessment strategies. For module design, it offers a ready sequence (i.e. empathise, define, ideate, prototype and test) that is paired with assessment touchpoints to support formative GC development. Implementation should adopt continuous improvement that strengthen experiential learning and drive continuous improvement over time. Institutional alignment and faculty capability building are also critical to sustaining this approach.

Future research should focus on empirical validation of the proposed framework through action research or longitudinal investigations that can assess its impact on student learning and employability outcomes. This effort would involve participation across all levels namely institutional, administrative and the student body. Additionally, exploring the scalability and adaptability of DT across different disciplinary and cultural settings is also essential to test and refine the application of the framework.

In conclusion, DT provides a compelling opportunity to rethink interdisciplinary education in HE. Through the integration of DT stages to CLT mechanisms and ICM outcomes, the framework clarifies how learning changes and offers a robust pathway to cultivate GC in measurable ways. Positioning DT as both a pedagogical tool and an institutional strategy can help universities prepare students to navigate complexity and lead with empathy in an increasingly interconnected world.

Funding

No funding was received in conducting this study.

Data availability

This study is based on an integrative review of previously published literature. All data used in this study are publicly available through the original published sources cited in the reference list. No new data were generated or collected for this research.

Ethics statement

Not applicable as this study is a review of published literature and involves no human participants.

AI usage disclosure

Microsoft Copilot was used in proofreading this manuscript. All ideas, analyses and conclusions were developed by the author.

References

- Alvarado, L.F. (2025), "Design thinking as an active teaching methodology in higher education: a systematic review", *Frontiers in Education*, *Frontiers*, Vol. 10, p. 1462938, doi: [10.3389/feduc.2025.1462938](https://doi.org/10.3389/feduc.2025.1462938).
- Auld, E., and Morris, P. (2019), "Science by streetlight and the OECD's measure of global competence: a new yardstick for internationalisation?", *Policy Futures in Education*, Vol. 17 No. 6, pp. 677-698, doi: [10.1177/1478210318819246](https://doi.org/10.1177/1478210318819246).
- Aydogan, I. and Tat, O. (2025), "How justified are the criticisms of bias against the OECD's global competence framework?", *International Journal of Educational Development*, Vol. 114, p. 103258, doi: [10.1016/j.ijedudev.2025.103258](https://doi.org/10.1016/j.ijedudev.2025.103258).
- Bailey, L., Ledger, S., Thier, M. and Pitts, C.M.T. (2023), "Global competence in PISA 2018: deconstruction of the measure", *Globalisation, Societies and Education*, Vol. 21 No. 3, pp. 367-376, doi: [10.1080/14767724.2022.2029693](https://doi.org/10.1080/14767724.2022.2029693).
- Bilderback, S., and Thompson, C.B. (2025), "Developing global leadership competence: redefining higher education for interconnected economies", *Higher Education, Skills and Work-Based Learning*, doi: [10.1108/HESWBL-10-2024-0301](https://doi.org/10.1108/HESWBL-10-2024-0301).
- Blundell, C.N. (2024), "A scoping review of design thinking in school-based teacher professional learning and development", *Professional Development in Education*, Vol. 50 No. 5, pp. 878-893, doi: [10.1080/19415257.2022.2132269](https://doi.org/10.1080/19415257.2022.2132269).
- Brassler, M. and Dettmers, J. (2017), "How to enhance interdisciplinary competence: interdisciplinary Problem-Based learning versus interdisciplinary Project-Based learning", *Interdisciplinary Journal of Problem-Based Learning*, Vol. 11 No. 2, doi: [10.7771/1541-5015.1686](https://doi.org/10.7771/1541-5015.1686).
- Braun, V., and Clarke, V. (2021), *Thematic Analysis: A Practical Guide*, Sage.
- Brenner, W. and Uebernickel, F. (Eds.). (2016), *Design Thinking for Innovation*, Springer International Publishing, Cham, doi: [10.1007/978-3-319-26100-3](https://doi.org/10.1007/978-3-319-26100-3).
- Buchanan, R. (2019), "Systems thinking and design thinking: the search for principles in the world We are making", *She Ji: The Journal of Design, Economics, and Innovation*, Vol. 5 No. 2, pp. 85-104, doi: [10.1016/j.sheji.2019.04.001](https://doi.org/10.1016/j.sheji.2019.04.001).
- Cao, C. and Meng, Q. (2020), "Effects of online and direct contact on Chinese international students' social capital in intercultural networks: testing moderation of direct contact and mediation of global competence", *Higher Education*, Vol. 80 No. 4, pp. 625-643, doi: [10.1007/s10734-020-00501-w](https://doi.org/10.1007/s10734-020-00501-w).
- Chandra, P., Hitchcock, S. and Seno-Alday, S. (2025), "Assessment style in interdisciplinary education: challenges in creating equitable assessment opportunities", *Studies in Higher Education*, Vol. 50 No. 3, pp. 525-536, doi: [10.1080/03075079.2024.2345187](https://doi.org/10.1080/03075079.2024.2345187).
- Choi, H., Kim, H. and Kim, N. (2024), "Enhancing creativity through a problem-based design thinking project in higher education", *Cogent Education*, Vol. 11 No. 1, p. 2378272, doi: [10.1080/2331186X.2024.2378272](https://doi.org/10.1080/2331186X.2024.2378272).
- Chuang, S. (2021), "The applications of constructivist learning theory and social learning theory on adult continuous development", *Performance Improvement*, Vol. 60 No. 3, pp. 6-14, doi: [10.1002/pfi.21963](https://doi.org/10.1002/pfi.21963).

- Cobb, D. and Couch, D. (2022), "Locating inclusion within the OECD's assessment of global competence: an inclusive future through PISA 2018?", *Policy Futures in Education*, SAGE Publications, Vol. 20 No. 1, pp. 56-72, doi: [10.1177/14782103211006636](https://doi.org/10.1177/14782103211006636).
- Costa, A.R., Ferreira, M., Barata, A., Viterbo, C., Rodrigues, J.S. and Magalhães, J. (2019), "Impact of interdisciplinary learning on the development of engineering students' skills", *European Journal of Engineering Education*, Taylor & Francis, Vol. 44 No. 4, pp. 589-601, doi: [10.1080/03043797.2018.1523135](https://doi.org/10.1080/03043797.2018.1523135).
- Crawford, E.O., Higgins, H.J. and Hilburn, J. (2020), "Using a global competence model in an instructional design course before social studies methods: a developmental approach to global teacher education", *The Journal of Social Studies Research*, SAGE Publications, Vol. 44 No. 4, pp. 367-381, doi: [10.1016/j.jssr.2020.04.002](https://doi.org/10.1016/j.jssr.2020.04.002).
- Cross, N. (2006), *Designly Ways of Knowing*, Springer, London.
- Cummings, C. and Yur-Austin, J. (2022), "Design thinking and community impact: a case study of project-based learning in an MBA capstone course", *Journal of Education for Business*, Vol. 97 No. 2, pp. 126-132, doi: [10.1080/08832323.2021.1887795](https://doi.org/10.1080/08832323.2021.1887795).
- Dearodff, D.K. (2006), "Identification and assessment of intercultural competence as a student outcome of internationalization", *Journal of Studies in International Education*, Vol. 10 No. 3, pp. 241-266, doi: [10.1177/1028315306287002](https://doi.org/10.1177/1028315306287002).
- Dearodff, D.K. and Arasaratnam-Smith, L.A. (Eds.). (2017), *Intercultural Competence in Higher Education: International Approaches, Assessment and Application*, First edition., Routledge, London; New York, NY.
- Deitte, L.A. and Omary, R.A. (2019), "The power of design thinking in medical education", *Academic Radiology*, Vol. 26 No. 10, pp. 1417-1420, doi: [10.1016/j.acra.2019.02.012](https://doi.org/10.1016/j.acra.2019.02.012).
- Dimitrieska, V. (2023), "Internationalization and global competence", in Buck, G.A., Dimitrieska, V. and Akerson, V.L. (Eds.), *Internationalizing Rural Science Teacher Preparation*, Springer International Publishing, Cham, Vol. 58, pp. 13-27, doi: [10.1007/978-3-031-46073-9_2](https://doi.org/10.1007/978-3-031-46073-9_2).
- Dorst, K. (2015), *Frame Innovation: Create New Thinking by Design*, The MIT Press, doi: [10.7551/mitpress/10096.001.0001](https://doi.org/10.7551/mitpress/10096.001.0001).
- Du, J., Jing, S. and Liu, J. (2012), "Creating shared design thinking process for collaborative design", *Journal of Network and Computer Applications*, Vol. 35 No. 1, pp. 111-120, doi: [10.1016/j.jnca.2011.02.014](https://doi.org/10.1016/j.jnca.2011.02.014).
- Dykhnych, L., Olena, K., Yana, L., Svitlana, N. and Olena, Y. (2022), "Prospects for the development of design thinking of higher education applicants in the culture and art industry in the context of digitalization", *Journal of Curriculum and Teaching*, Vol. 11 No. 5, pp. 196, doi: [10.5430/jct.v11n5p196](https://doi.org/10.5430/jct.v11n5p196).
- Engel, L.C., Rutkowski, D. and Thompson, G. (2019), "Toward an international measure of global competence? A critical look at the PISA 2018 framework", *Globalisation, Societies and Education*, Vol. 17 No. 2, pp. 117-131, doi: [10.1080/14767724.2019.1642183](https://doi.org/10.1080/14767724.2019.1642183).
- Grotlüschen, A. (2018), "Global competence – does the new OECD competence domain ignore the global South?", *Studies in the Education of Adults*, Routledge, Vol. 50 No. 2, pp. 185-202, doi: [10.1080/02660830.2018.1523100](https://doi.org/10.1080/02660830.2018.1523100).
- Guaman-Quintanilla, S., Everaert, P., Chiliza, K. and Valcke, M. (2023), "Impact of design thinking in higher education: a multi-actor perspective on problem solving and creativity", *International Journal of Technology and Design Education*, Vol. 33 No. 1, pp. 217-240, doi: [10.1007/s10798-021-09724-z](https://doi.org/10.1007/s10798-021-09724-z).
- Hains-Wesson, R. and Ji, K. (2020), "Students' perceptions of an interdisciplinary global study tour: uncovering inexplicit employability skills", *Higher Education Research & Development*, Routledge, Vol. 39 No. 4, pp. 657-671, doi: [10.1080/07294360.2019.1695752](https://doi.org/10.1080/07294360.2019.1695752).
- Hantsiuk, T., Vintoniv, K., Opar, N. and Hryvnyak, B. (2021), "Developing intercultural competence through design thinking", *European Integration Studies*, Vol. 1 No. 15, pp. 9-21, doi: [10.5755/j01.eis.1.15.28930](https://doi.org/10.5755/j01.eis.1.15.28930).
- Hendricks, S., Conrad, N., Douglas, T.S. and Mutsvangwa, T. (2018), "A modified stakeholder participation assessment framework for design thinking in health innovation", *Healthcare*, Vol. 6 No. 3, pp. 191-196, doi: [10.1016/j.hjdsi.2018.06.003](https://doi.org/10.1016/j.hjdsi.2018.06.003).
- Henriksen, D. (2017), "Creating STEAM with design thinking: beyond STEM and arts integration", *STEAM*, Vol. 3 No. 1, pp. 1-11, doi: [10.5642/steam.20170301.11](https://doi.org/10.5642/steam.20170301.11).

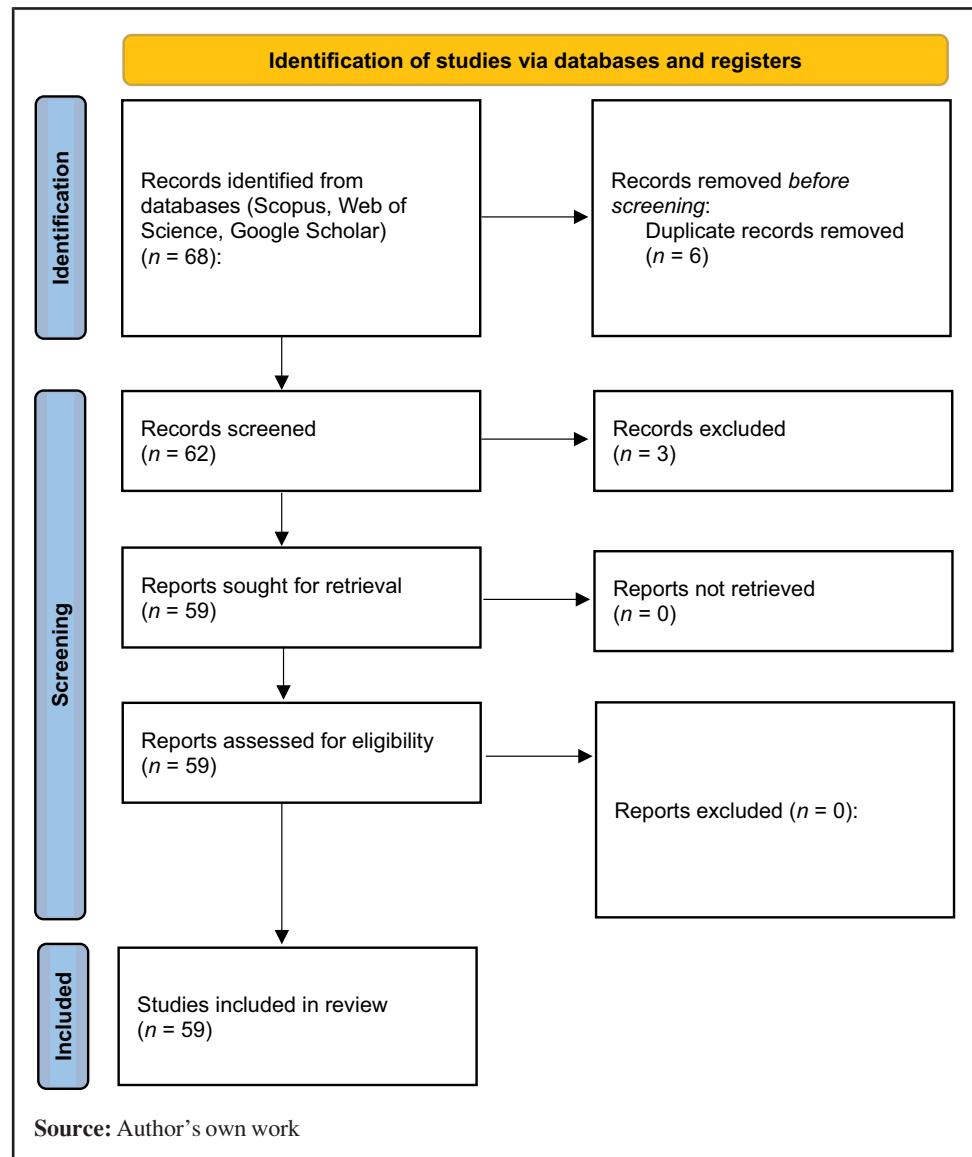
- Henriksen, D., Richardson, C. and Mehta, R. (2017), "Design thinking: a creative approach to educational problems of practice", *Thinking Skills and Creativity*, Vol. 26, pp. 140-153, doi: [10.1016/j.tsc.2017.10.001](https://doi.org/10.1016/j.tsc.2017.10.001).
- Huq, A. and Gilbert, D. (2017), "All the world's a stage: transforming entrepreneurship education through design thinking", *Education + Training*, Vol. 59 No. 2, pp. 155-170, doi: [10.1108/ET-12-2015-0111](https://doi.org/10.1108/ET-12-2015-0111).
- Islam, M. and Stamp, K. (2020), "A reflection on future directions: global international and intercultural competencies in higher education", *Research in Comparative and International Education*, Vol. 15 No. 1, pp. 69-75, doi: [10.1177/1745499920901951](https://doi.org/10.1177/1745499920901951).
- Jiang, C. and Pang, Y. (2023), "Enhancing design thinking in engineering students with project-based learning", *Computer Applications in Engineering Education*, Vol. 31 No. 4, pp. 814-830, doi: [10.1002/cae.22608](https://doi.org/10.1002/cae.22608).
- Jiaxin, G., Huijuan, Z. and Md Hasan, H. (2024), "Global competence in higher education: a ten-year systematic literature review", *Frontiers in Education*, Vol. 9, p. 1404782, doi: [10.3389/feduc.2024.1404782](https://doi.org/10.3389/feduc.2024.1404782).
- Jooste, N., and Heleta, S. (2017), "Global citizenship versus globally competent graduates: a critical view from the South", *Journal of Studies in International Education*, Vol. 21 No. 1, pp. 39-51, doi: [10.1177/1028315316637341](https://doi.org/10.1177/1028315316637341).
- Kjellgren, B. (2024), "Innovative ideas and academic realpolitik: Building global competence development into a European university alliance", *2024 IEEE Frontiers in Education Conference (FIE), Presented at the 2024 IEEE Frontiers in Education Conference (FIE)*, IEEE, Washington, DC, pp. 1-5, doi: [10.1109/FIE61694.2024.10893174](https://doi.org/10.1109/FIE61694.2024.10893174).
- Kjellgren, B. and Richter, T. (2021), "Education for a sustainable future: strategies for holistic global competence development at engineering institutions", *Sustainability*, Vol. 13 No. 20, p. 11184, doi: [10.3390/su132011184](https://doi.org/10.3390/su132011184).
- Klein, J.T. (1993), *Interdisciplinarity: History, Theory, and Practice*, 3. print, Wayne State Univ. Press, Detroit.
- Lawson, B. (2010), "How designers think: the design process demystified", *Reprint*, Elsevier Architectural Press, Amsterdam Heidelberg.
- Ledoux, M. and McHenry, N. (2004), "A constructivist approach in the interdisciplinary instruction of science and language arts methods", *Teaching Education*, Vol. 15 No. 4, pp. 385-399, doi: [10.1080/1047621042000304510](https://doi.org/10.1080/1047621042000304510).
- Lee, H. and Park, J.E. (2021), "Designing a new empathy-oriented prototyping toolkit for the design thinking process: creativity and design sensibility", *International Journal of Art & Design Education*, Vol. 40 No. 2, pp. 324-341, doi: [10.1111/jade.12345](https://doi.org/10.1111/jade.12345).
- Lee, J.H., Ostwald, M.J., and Gu, N. (2020), *Design Thinking: Creativity, Collaboration and Culture*, Springer International Publishing, Cham, doi: [10.1007/978-3-030-56558-9](https://doi.org/10.1007/978-3-030-56558-9).
- Levy, M. (2017), "Design thinking in multidisciplinary learning teams: Insights from multidisciplinary teaching events", in Metzger, A. and Persson, A. (Eds.), *Advanced Information Systems Engineering Workshops*, Vol. 286 Springer International Publishing, Cham, pp. 101-109, doi: [10.1007/978-3-319-60048-2_10](https://doi.org/10.1007/978-3-319-60048-2_10).
- Li, Y. (2013), "Cultivating student global competence: a pilot experimental study", *Decision Sciences Journal of Innovative Education*, Vol. 11 No. 1, pp. 125-143, doi: [10.1111/j.1540-4609.2012.00371.x](https://doi.org/10.1111/j.1540-4609.2012.00371.x).
- Liu, A. and Lu, S. (2020), "Functional design framework for innovative design thinking in product development", *CIRP Journal of Manufacturing Science and Technology*, Vol. 30, pp. 105-117, doi: [10.1016/j.cirpj.2020.04.008](https://doi.org/10.1016/j.cirpj.2020.04.008).
- Majewska, I.A. (2023), "Teaching global competence: challenges and opportunities", *College Teaching*, Vol. 71 No. 2, pp. 112-124, doi: [10.1080/87567555.2022.2027858](https://doi.org/10.1080/87567555.2022.2027858).
- Marks, J. and Chase, C.C. (2019), "Impact of a prototyping intervention on middle school students' iterative practices and reactions to failure", *Journal of Engineering Education*, Vol. 108 No. 4, pp. 547-573, doi: [10.1002/je.20294](https://doi.org/10.1002/je.20294).
- McGowan, B. (2019), "The role of the university library in creating inclusive healthcare hackathons: a case study with design-thinking processes", *IFLA Journal*, Vol. 45 No. 3, pp. 246-253, doi: [10.1177/0340035219854214](https://doi.org/10.1177/0340035219854214).
- McLaughlin, J.E., Chen, E., Lake, D., Guo, W., Skywark, E.R., Chernik, A. and Liu, T. (2022), "Design thinking teaching and learning in higher education: Experiences across four universities", (Eds) Margherita, A, *PLOS ONE*, Vol. 17 No. 3, p. e0265902, doi: [10.1371/journal.pone.0265902](https://doi.org/10.1371/journal.pone.0265902).

- Micheli, P., Wilner, S.J.S., Bhatti, S.H., Mura, M. and Beverland, M.B. (2019), "Doing design thinking: conceptual review, synthesis, and research agenda", *Journal of Product Innovation Management*, Vol. 36 No. 2, pp. 124-148, doi: [10.1111/jpim.12466](https://doi.org/10.1111/jpim.12466).
- Mokski, E., Filho, W.L., Sehnem, S., Guerra, J.B.S.O. and de, A. (2022), "Education for sustainable development in higher education institutions: an approach for effective interdisciplinarity", *International Journal of Sustainability in Higher Education*, Vol. 24 No. 1, pp. 96-117, doi: [10.1108/IJSHE-07-2021-0306](https://doi.org/10.1108/IJSHE-07-2021-0306).
- Ngoc, N.T.M. and Bin, J.O.C. (2025), "Shaping an interdisciplinary curriculum design framework", *Journal of Educational Research and Review*, pp. 29-42, doi: [10.62767/jerr801.9768](https://doi.org/10.62767/jerr801.9768).
- OECD (2018), *OECD PISA Global Competence Framework*, Organisation for Economic Co-operation and Development.
- OECD (2019), *PISA 2018 Results (Volume I): What Students Know and Can Do*, OECD, doi: [10.1787/5f07c754-en](https://doi.org/10.1787/5f07c754-en).
- Oudenampsen, J., van de Pol, M., Blijlevens, N. and Das, E. (2023), "Interdisciplinary education affects student learning: a focus group study", *BMC Medical Education*, Vol. 23 No. 1, p. 169, doi: [10.1186/s12909-023-04103-9](https://doi.org/10.1186/s12909-023-04103-9).
- Pande, M. and Bharathi, S.V. (2020), "Theoretical foundations of design thinking – a constructivism learning approach to design thinking", *Thinking Skills and Creativity*, Vol. 36, p. 100637, doi: [10.1016/j.tsc.2020.100637](https://doi.org/10.1016/j.tsc.2020.100637).
- Piaget, J. (1950), *The Psychology of Intelligence*, Routledge.
- Ramos, K., Wolf, E.J., and Hauber-Özer, M. (2021), "Teaching for global competence: a responsibility of teacher educators", *Journal of Research in Childhood Education*, Routledge, Vol. 35 No. 2, pp. 311-330, doi: [10.1080/02568543.2021.1880998](https://doi.org/10.1080/02568543.2021.1880998).
- Redante, R.C., de Medeiros, J.F., Vidor, G., Cruz, C.M.L. and Ribeiro, J.L.D. (2019), "Creative approaches and green product development: using design thinking to promote stakeholders' engagement", *Sustainable Production and Consumption*, Vol. 19, pp. 247-256, doi: [10.1016/j.spc.2019.04.006](https://doi.org/10.1016/j.spc.2019.04.006).
- Repko, A.F., and Szostak, R. (2017), *Interdisciplinary Research: Process and Theory*, Third edition., Sage, Los Angeles, Calif. London New Delhi.
- Richter, T. and Kjellgren, B. (2024), "Global competence development around the world: a systematic review of practical initiatives in engineering education", *Cogent Education*, Vol. 11 No. 1, p. 2396190, doi: [10.1080/2331186X.2024.2396190](https://doi.org/10.1080/2331186X.2024.2396190).
- Sälzer, C. and Roczen, N. (2018), "Assessing global competence in PISA 2018: challenges and approaches to capturing a complex construct", *International Journal of Development Education and Global Learning*, UCL Press, Vol. 10 No. 1, doi: [10.18546/ijdegl.10.1.02](https://doi.org/10.18546/ijdegl.10.1.02).
- Sheehan, N.T., Gujarathi, M.R., Jones, J.C. and Phillips, F. (2018), "Using design thinking to write and publish novel teaching cases: tips from experienced case authors", *Journal of Management Education*, Vol. 42 No. 1, pp. 135-160, doi: [10.1177/1052562917741179](https://doi.org/10.1177/1052562917741179).
- Smith, S.H. and Paracka, D.J. (2018), "Global learning is shared learning: interdisciplinary intercultural competence at a comprehensive regional university", *International Journal of Intercultural Relations*, Vol. 63, pp. 17-26, doi: [10.1016/j.ijintrel.2017.11.003](https://doi.org/10.1016/j.ijintrel.2017.11.003).
- Snyder, H. (2019), "Literature review as a research methodology: an overview and guidelines", *Journal of Business Research*, Vol. 104, pp. 333-339, doi: [10.1016/j.jbusres.2019.07.039](https://doi.org/10.1016/j.jbusres.2019.07.039).
- Sofyan, S., Habibi, A., Attar, R.W., Hendra, R., Alhazmi, A.H., Guillén-Gámez, F.D. and Sembiring, D.A.E. P. (2025), "The impact of global-intercultural competence and social capital on students' motivation to participate in exchange programs: a PLS-SEM approach", *Power and Education*, doi: [10.1177/17577438251331917](https://doi.org/10.1177/17577438251331917).
- Songer, A.D., and Breitzkreuz, K.R. (2022), "Multi-Disciplined international service learning: a pedagogical model and case study", *Role of Education and Pedagogical Approach in Service Learning*, Emerald Publishing Limited, Vol. 46, pp. 23-58, doi: [10.1108/S2055-364120220000046015](https://doi.org/10.1108/S2055-364120220000046015).
- Sreenivasan, A. and Suresh, M. (2024), "Design thinking and artificial intelligence: a systematic literature review exploring synergies", *International Journal of Innovation Studies*, Vol. 8 No. 3, pp. 297-312, doi: [10.1016/j.ijis.2024.05.001](https://doi.org/10.1016/j.ijis.2024.05.001).
- Striolo, A., Jones, A. and Styan, C. (2023), "The effectiveness of an interdisciplinary postgraduate-taught program in terms of employability", *Education for Chemical Engineers*, Vol. 45, pp. 1-10, doi: [10.1016/eece.2023.06.006](https://doi.org/10.1016/eece.2023.06.006).

- Teng, Y. and Cosier, M.E. (2024), "Influences of cultural capital and internationalization on global competence in higher education: a systematic literature review", *Frontiers in Education*, Vol. 9, p. 1397642, doi: [10.3389/feduc.2024.1397642](https://doi.org/10.3389/feduc.2024.1397642).
- Thomas, A., Menon, A., Boruff, J., Rodriguez, A.M. and Ahmed, S. (2014), "Applications of social constructivist learning theories in knowledge translation for healthcare professionals: a scoping review", *Implementation Science*, Vol. 9 No. 1, p. 54, doi: [10.1186/1748-5908-9-54](https://doi.org/10.1186/1748-5908-9-54).
- Torraco, R.J. (2005), "Writing integrative literature reviews: guidelines and examples", *Human Resource Development Review*, Vol. 4 No. 3, pp. 356-367, doi: [10.1177/1534484305278283](https://doi.org/10.1177/1534484305278283).
- Torraco, R.J. (2016), "Writing integrative literature reviews: using the past and present to explore the future", *Human Resource Development Review*, Vol. 15 No. 4, pp. 404-428, doi: [10.1177/1534484316671606](https://doi.org/10.1177/1534484316671606).
- Tsai, C.-A., Song, M.-Y.W., Lo, Y.-F. and Lo, C.-C. (2023), "Design thinking with constructivist learning increases the learning motivation and wicked problem-solving capability—an empirical research in Taiwan", *Thinking Skills and Creativity*, Vol. 50, p. 101385, doi: [10.1016/j.tsc.2023.101385](https://doi.org/10.1016/j.tsc.2023.101385).
- UNESCO UNESCO (2015), Rethinking Education: Towards a Global Common Good?, doi: [10.54675/MDZL5552](https://doi.org/10.54675/MDZL5552).
- UNESCO (2021), "Reimagining our futures together: a new social contract for education, UNESCO", doi: [10.54675/ASRB4722](https://doi.org/10.54675/ASRB4722).
- Vendraminelli, L., Macchion, L., Nosella, A. and Vinelli, A. (2023), "Design thinking: strategy for digital transformation", *Journal of Business Strategy*, Vol. 44 No. 4, pp. 200-210, doi: [10.1108/JBS-01-2022-0009](https://doi.org/10.1108/JBS-01-2022-0009).
- Verganti, R., Dell'Era, C. and Swan, K.S. (2021), "Design thinking: critical analysis and future evolution", *Journal of Product Innovation Management*, Vol. 38 No. 6, pp. 603-622, doi: [10.1111/jpim.12610](https://doi.org/10.1111/jpim.12610).
- Vygotsky, L.S. (1980), *Mind in Society: Development of Higher Psychological Processes*, (Eds) Cole, M., Jolm-Steiner, V., Scribner, S. and Souberman, E., Harvard University Press, doi: [10.2307/j.ctvjf9vz4](https://doi.org/10.2307/j.ctvjf9vz4).
- Wang, C.-C. (2024), "Using design thinking for interdisciplinary curriculum design and teaching: a case study in higher education", *Humanities and Social Sciences Communications*, Vol. 11 No. 1, p. 307, doi: [10.1057/s41599-024-02813-z](https://doi.org/10.1057/s41599-024-02813-z).
- Whelan, L., Hayes, R., Kiernan, L. and Deloughrey, N. (2024), "Continuous improvement in higher education – the validation of a design thinking framework as applied in a case study of academic restructuring", *International Journal of Innovative Business Strategies*, Vol. 10 No. 2, pp. 758-765, doi: [10.20533/ijibs.2046.3626.2024.0092](https://doi.org/10.20533/ijibs.2046.3626.2024.0092).
- Whittemore, R. and Knafl, K. (2005), "The integrative review: updated methodology", *Journal of Advanced Nursing*, Vol. 52 No. 5, pp. 546-553, doi: [10.1111/j.1365-2648.2005.03621.x](https://doi.org/10.1111/j.1365-2648.2005.03621.x).
- Xu, C., Wu, C.-F., Xu, D.-D., Lu, W.-Q. and Wang, K.-Y. (2022), "Challenges to student interdisciplinary learning effectiveness: an empirical case study", *Journal of Intelligence*, Vol. 10 No. 4, p. 88, doi: [10.3390/jintelligence10040088](https://doi.org/10.3390/jintelligence10040088).
- Xu, J., Liu, G., Liu, S., and Xu, R. (2018), "The collaboration learning in the interdisciplinary workshop based on design thinking: a learning outcome perspective", in Marcus, A and Wang, W (Eds), *Design, User Experience, and Usability: Designing Interactions*, Springer International Publishing, Cham, Vol. 10919, pp. 158-168, doi: [10.1007/978-3-319-91803-7_12](https://doi.org/10.1007/978-3-319-91803-7_12).
- Yamada, A. (2018), "Developing global competencies through interdisciplinary studies: Why collaboration is important between STEM and Non-STEM students", in Hawkins, J.N., Yamada, A., Yamada, R. and Jacob, W.J. (Eds), *New Directions of STEM Research and Learning in the World Ranking Movement*, Springer International Publishing, Cham, pp. 79-96, doi: [10.1007/978-3-319-98666-1_6](https://doi.org/10.1007/978-3-319-98666-1_6).
- Yamada, R. (2023), "How does US STEM higher education cultivate global competences through interdisciplinary programs?", in Yamada, R., Yamada, A. and Neubauer, D.E. (Eds.), *Transformation of Higher Education in the Age of Society 5.0*, Springer International Publishing, Cham, pp. 105-125, doi: [10.1007/978-3-031-15527-7_9](https://doi.org/10.1007/978-3-031-15527-7_9).

Appendix 1

Table A1 Inclusion and exclusion criteria	
Inclusion	Exclusion
Peer-reviewed journal articles	Non-peer reviewed documents, e.g. dissertation, conference paper
Published between 2014 and 2025	Not within timeframe specified
Written in English as either empirical and conceptual papers	Not written in English
Within the context of higher education	Non-higher education setting or context
Substantive relevance to global competence, interdisciplinary learning and design thinking	Limited relevance to topics of interest
Source(s): Author's own work	

Figure A1 PRISMA flow diagram for document selection

Corresponding author

Asrif Yusoff can be contacted at: a.yusoff@greenwich.ac.uk

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgroupublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com