

TẦM QUAN TRỌNG CỦA THIẾT KẾ VÀ VẬN HÀNH CHƯƠNG TRÌNH ĐÀO TẠO THEO HƯỚNG LIÊN NGÀNH TẠI TRƯỜNG ĐẠI HỌC: NGHIÊN CỨU TỔNG QUAN TÀI LIỆU HỆ THỐNG

*INTERDISCIPLINARY CURRICULUM IN HIGHER EDUCATION:
EXPLORING BENEFITS, CHALLENGES, AND KEY SUCCESS FACTORS*

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<p>Ngày nhận: 08/01/2025 Ngày nhận lại: 21/01/2025 Duyệt đăng: 18/03/2025 Mã số: TCKH-S01T03-2025-B04 ISSN: 2354 - 0788</p> <p>Từ khóa: Giáo dục đại học, Chương trình đào tạo liên ngành, Thiết kế chương trình đào tạo, Vận hành chương trình đào tạo.</p> <p>Keywords: Curriculum Design, Higher Education, Interdisciplinary, Implementation.</p>	<p>Bài báo này trình bày một tổng quan tài liệu hệ thống (Systematic Literature Review - SLR) về tầm quan trọng của việc thiết kế và vận hành chương trình đào tạo (CTĐT) theo hướng liên ngành tại các trường đại học. Thông qua việc phân tích 46 nghiên cứu được công bố trên các cơ sở dữ liệu uy tín, bài báo khám phá các lợi ích, thách thức và các yếu tố quan trọng trong việc triển khai các chương trình liên ngành. Kết quả SLR cho thấy rằng các CTĐT liên ngành có khả năng thúc đẩy tư duy phản biện, năng lực giải quyết vấn đề phức tạp, tăng cường kỹ năng hợp tác và giao tiếp, đồng thời chuẩn bị tốt hơn cho sinh viên trong môi trường làm việc đa dạng và thay đổi nhanh chóng. Tuy nhiên, việc triển khai các chương trình này đòi hỏi sự phối hợp chặt chẽ giữa các khoa, sự linh hoạt trong thiết kế chương trình, đầu tư thích đáng về nguồn lực và cam kết từ nhà trường.</p> <p>ABSTRACT This paper presents a systematic literature review (SLR) on the significance of designing and implementing interdisciplinary curricula in higher education. By analysing 46 peer-reviewed studies published in reputable databases, this review explores the benefits, challenges, and critical success factors associated with interdisciplinary programs (IDPs). The SLR findings reveal that interdisciplinary education fosters critical thinking, complex problem-solving skills, enhanced collaboration and communication abilities, and better prepares students for a diverse and rapidly changing workplace. However, to implement these programs, it is necessary to have good collaboration among departments, flexibility in curriculum design, an adequate investment in resources, and a strong institutional commitment.</p>

1. Introduction

The 21st century presents global society with significant, multifaceted challenges, including climate change, social inequality, and rapid technological advancement. These complex issues require innovative, interdisciplinary solutions that move beyond the boundary of traditional academic fields. Consequently, the development of a workforce proficient in interdisciplinary thinking - integrating knowledge and methodologies from diverse disciplines - has become increasingly important. Traditional educational curricula, often

emphasizing a narrow disciplinary specialization, have demonstrated limitations in adequately preparing students to address complex, interconnected real-world problems. Researches have shown that interdisciplinary curricula offer remarkable advantages, such as fostering critical thinking, enhancing problem-solving abilities, promoting creativity, and better preparing students for diverse professional environments (Craig et al., 2022; Newell, 2010). However, the design and implementation of IDPs present considerable challenges, including cultural differences among

academic departments, complexities in curriculum development, and difficulties in assessing learning outcomes (Wineburg & Grossman, 2000). Studies on interdisciplinary curriculum design and implementation have provided valuable insights into their effectiveness and practical challenges (e.g., Vink et al., 2017; Jensenius, 2012; Manolakelli, 2022). These studies demonstrate that interdisciplinary curricula can help learners develop critical competencies but require meticulous preparation and collaboration among stakeholders. However, most of these studies are conducted in international contexts, with limited research focusing on interdisciplinary curriculum design and implementation in Vietnam. This paper was conducted in Systematic Literature Review methodology to synthesize, evaluate, and analyze existing research on this topic. The objective is to clarify the significance, challenges, and success factors associated with the implementation of interdisciplinary curricula in higher education institutions. This review was guided by the following research questions:

- 1) What are the benefits that interdisciplinary curricula offer to students and institutions?
- 2) What challenges are encountered in the design and implementation of interdisciplinary curricula?
- 3) What key factors contribute to the successful implementation of interdisciplinary curricula?

2. Research Methodology

For the systematic review, the Scopus database owned by Elsevier in the Netherlands was used. The selection of articles for analysis focused on the field of education and was conducted on December 20, 2024. Access to the database and data extraction were facilitated through a paid account provided by the VNUHCM. The VOSviewer tool, developed by Leiden University, was utilized for data analysis and visualization (van Eck & Waltman, 2009). A total of 1,453 journal articles, theses, dissertations, and conference proceedings were queried in the first search from the databases.

Table 1. Search terms and initial limiters

Search terms	Databases	Limiters
Interdisciplinary education Interdisciplinary curriculum Higher education University Curriculum design Program implementation Curriculum implementation	Scopus	Scholarly articles, conference proceedings, dissertations, and theses

(Source: Compiled by the author)

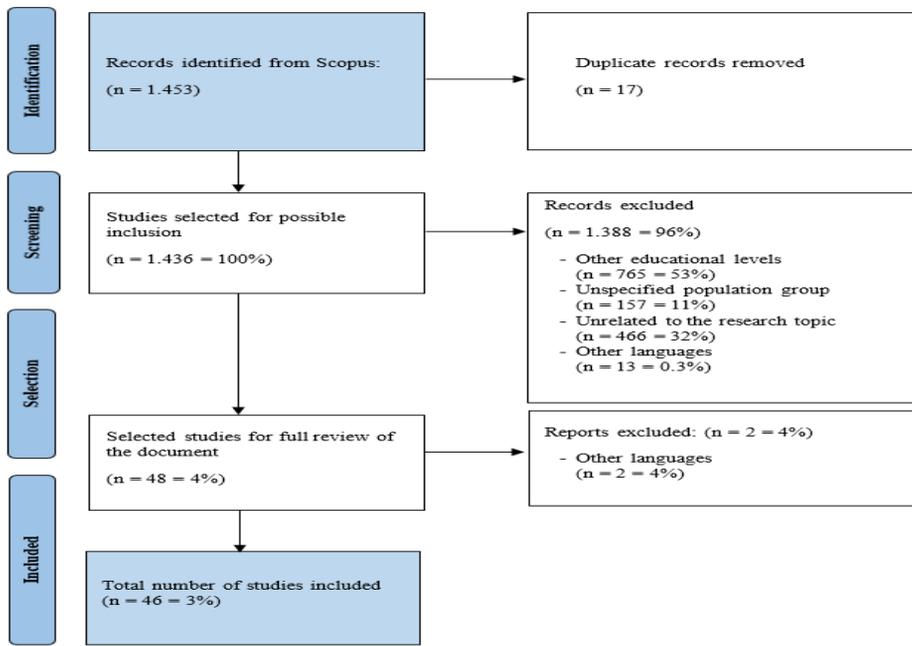
In the second step, many articles were removed following the inclusion and exclusion criteria (Bartholomew & Yoshikawa, 2018). After removing duplicate articles, the systematic review process's initial step involved analyzing each article's abstracts. The author conducted a review and further excluded articles that did not meet the inclusion criteria. Following the abstract analysis, a final set of 46 articles was selected for in-depth examination. Information

deemed significant, such as author names, publication years, article titles, and the main themes and contributions of each article, was extracted and compiled into a matrix. This matrix served as the foundation for the systematic literature analysis, enabling a comprehensive exploration of the key findings and insights offered by the selected articles. Table 2 demonstrates the inclusion and exclusion criteria, Figures 1 and 2 display the screening process.

Table 2. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Peer-reviewed Full text available from the database Published in English Higher education	Published in other languages Unrelated to the research topic Not focused on undergraduate students

(Source: Compiled by the author)



(Source: Compiled by the author)

Figure 1. PRISMA flow chart of article selection process

3. RESULTS AND DISCUSSION

3.1. Approaches to Interdisciplinary Curriculum Design and their Significance

Throughout the development of education, various approaches have been adopted in curriculum design, ranging from discipline-specific to multidisciplinary, interdisciplinary, and transdisciplinary approaches (Jacobs, 1989; Smith & Karr-Kidwell, 2000). While the discipline-specific approach provides in-depth knowledge and skills in a particular field, it often neglects connections with other areas, limiting learners' ability to view problems holistically. In contrast, the multidisciplinary approach combines knowledge from multiple disciplines but maintains their relative independence, resulting in fragmented information and limited integration (Choi & Pak, 2006). This hinders learners' ability to effectively apply knowledge in real-world contexts. The interdisciplinary approach, on the other hand, seeks to integrate knowledge, methods, and theories from different

fields to create a new perspective where disciplines interact and influence each other (Lattuca, 2001). This approach enables learners to develop a comprehensive knowledge framework, equipping them with the flexibility and creativity needed to address complex problems. Lastly, the transdisciplinary approach transcends disciplinary boundaries, addressing complicated issues through collaboration among various stakeholders (Nicolescu, 2002).

This approach requires learners to possess systems thinking, teamwork, and effective communication skills to develop practical solutions. Among these approaches, the interdisciplinary approach is widely endorsed by educators due to its ability to bridge connections across disciplines, focus on learner engagement, and encourage active participation (Baishya, 2014). It also equips learners with essential knowledge and skills to adapt to societal changes. The analysis revealed numerous benefits of interdisciplinary curricula, summarized in Table 3 below:

Table 3. Benefits of Interdisciplinary Curriculum

Benefit	Description	Related Studies
Developing critical thinking and solving complex problems	Interdisciplinary curricula enable students to approach issues from multiple perspectives, using diverse methodologies, fostering critical thinking and comprehensive, creative problem-solving skills.	

Benefit	Description	Related Studies
Enhancing collaboration and communication skills	Working in a multidisciplinary environment helps students develop teamwork and effective communication skills, including respect for diversity and negotiation for consensus.	Craig et al. (2022), Akhtar et al. (2024), Zang et al. (2023), Chang et al. (2022), Su (2024), de Reviere (2024), Liu (2021, 2021a), Zenk (2024), Chan (2021), Righi et al. (2021), Oprisan (2022), Madden et al. (2013), Novis-Deutsch et al. (2024), Holley (2009), Woods (2007)
Better preparation for the job market	IDPs equip students with diverse skills such as adaptability, systems thinking, and the ability to work in diverse teams, essential for success in a rapidly changing labor market.	
Fostering creativity and innovation	Combining knowledge and methodologies from various fields generates new, groundbreaking ideas, driving innovation in science, technology, and society.	

(Source: Based on Scopus database, edited by author)

First, they allow students to approach issues from multiple perspectives, employing diverse methodologies, thereby cultivating critical thinking and comprehensive, innovative problem-solving abilities (Craig et al., 2022; Repko, 2012). Additionally, engaging in a multidisciplinary environment enhances students' collaboration and communication skills. This includes fostering teamwork, effective communication, respect for diversity, and negotiation skills to reach consensus (Liu, 2021; Holley, 2009).

Moreover, IDPs better prepare students for the job market by equipping them with versatile skills such as adaptability, systems thinking, and the ability to work in diverse teams. These competencies are increasingly vital for success in a dynamic and rapidly changing labor environment (Zang et al., 2023; Novis-Deutsch et al., 2024). Finally, the integration of knowledge and methodologies from various disciplines stimulates creativity and innovation, generating groundbreaking ideas that contribute to advancements in science, technology, and society (Madden et al., 2013; Su, 2024).

These benefits are particularly crucial in addressing complex, multifaceted global challenges such as climate change, public health, and digital transformation. By adopting a multidimensional and flexible approach, IDPs not only support students in developing individual competencies but also prepare them to become responsible global citizens capable of contributing to sustainable societal development.

3.2. Characteristics and Implementation of Interdisciplinary Curricula

Interdisciplinary curricula differ significantly from traditional discipline-specific programs (Smith & Karr-Kidwell, 2000). These programs intentionally integrate knowledge across subjects

to address real-world issues (Jacobs, 1989). They emphasize relationships and connections between disciplines, encouraging learners to explore links across various fields. Active student participation is another key feature, as students are motivated to collaborate and integrate ideas from different disciplines (Newell & Green, 1982). Additionally, interdisciplinary curricula foster critical thinking and problem-solving skills, enabling students to analyze complex issues from diverse perspectives and propose integrated solutions (Repko, 2008).

Designing an interdisciplinary curriculum requires close collaboration among faculty members from different fields (Wineburg & Grossman, 2000). The process begins with identifying learning objectives that are interdisciplinary, specific, measurable, achievable, relevant, and time-bound (SMART). Following this, the selection and integration of content should align with these objectives while highlighting connections across disciplines. Learning activities and teaching methods must encourage interaction, discussion, collaboration, and real-world application through active teaching strategies such as Problem-Based Learning, Project-Based Learning, and case studies. Learning materials should also support integration, drawing from diverse resources and guiding students on their effective use.

3.3. Challenges and Solutions in Interdisciplinary Curriculum Implementation

Effective implementation of interdisciplinary curricula requires adequate preparation in terms of infrastructure, financial resources, and personnel. Faculty professional development is critical to enhancing interdisciplinary teaching capabilities, including curriculum design, teaching methods, learning outcome assessment, and teamwork in interdisciplinary settings (Woods, 2007; Bleakley et al., 2011; Modo & Kinchin, 2011). Additionally,

student support systems and mechanisms for continuous program evaluation and improvement are essential.

However, interdisciplinary curriculum implementation faces various challenges. Stember (1991) identified barriers stemming from learners (disciplinary thinking, lack of motivation, difficulty in collaboration), instructors (lack of experience, difficulty in teamwork), and institutions (resource constraints, insufficient support). To overcome these obstacles, building an active learning community that fosters interaction, experience-

sharing, and mutual learning among learners and educators is crucial. Providing training and support for faculty and students is equally important for skill enhancement. Establishing mechanisms for evaluating and recognizing interdisciplinary learning outcomes ensures fairness and transparency. Furthermore, efforts to shift disciplinary mindsets and foster collaboration and integration across fields are essential. The findings from the SLR highlight the significant challenges associated with both the design and implementation of IDPs, which are detailed in Table 4.

Table 4. Challenges in Designing and Implementing IDPs

Challenge	Description	Related Studies
Coordination among departments	Developing IDPs requires close collaboration among departments, which may face difficulties due to differences in academic culture, objectives, processes, and evaluation systems.	Torruellas Garcia et al. (2022), Baishya (2014), Ellis & Stuen (1998), Holley (2017), Davies & Devlin (2007), Khan et al. (2023), Modo & Kinchin (2011), Stember (1991), Wineburg & Grossman (2000), Holley (2009), Franks et al. (2007), Hollmén (2015), Roshania et al. (2023).
Designing flexible programs	IDPs must be highly flexible to adapt to rapid changes in knowledge and practical demands. However, integrating content from various fields in a coherent and meaningful way poses a challenge.	
Faculty expertise	Faculty members must possess the knowledge, skills, and experience necessary to teach interdisciplinary courses, including teamwork, interdisciplinary communication, and adaptability in teaching methods.	
Assessment of outcomes	Evaluating the outcomes of IDPs is complex due to the multidimensional and less quantifiable nature of objectives. Effective assessment methods, incorporating both quantitative and qualitative approaches, are essential.	

(Source: Based on Scopus database, edited by author)

First and foremost, coordination among departments and academic units is a major obstacle. Developing such programs necessitates close collaboration among stakeholders, yet differences in academic cultures, goals, workflows, and evaluation systems can result in conflicts or a lack of consensus (Baishya, 2014; Khan et al., 2023; Stember, 1991).

Second, program design must ensure a high degree of flexibility to accommodate the rapidly evolving nature of knowledge and practical demands. However, selecting and integrating content from diverse fields in a logical and meaningful manner is a considerable challenge, requiring careful deliberation on both content and instructional methods (Khan et al., 2023; Torruellas Garcia et al., 2022).

Faculty expertise is another critical factor in the success of IDPs. Faculty members not only

need deep knowledge and specialized skills but also must be proficient in teamwork, interdisciplinary communication, and innovative teaching methods to meet the multidimensional requirements of these programs (Hollmén, 2015; Wineburg & Grossman, 2000).

Finally, assessing student outcomes in IDPs is particularly challenging due to the multidimensional and often qualitative nature of the objectives. Developing effective assessment methods that combine both quantitative and qualitative approaches is essential to accurately reflect student achievements (Torruellas Garcia et al., 2022; Ellis & Stuen, 1998). Addressing these challenges requires substantial investment in effort and resources from all stakeholders, and strategically leveraging the key success factors outlined in Table 5 to ensure the success and sustainability of IDPs.

Table 5. Critical Factors for Ensuring the Success of IDPs

Factor	Description	Related Studies
Institutional commitment	Support and investment from the institution in terms of financial resources, personnel, and facilities are essential to ensure the success and sustainability of the program.	Tosunöz (2021), Chen & Wang (2021), Koichu et al. (2022), Cottafava et al. (2022), Ming et al. (2023), Bear et al. (2023), Baishya (2014), Vink et al. (2017), Hainaut (1986), Jacobs (1989), Ellis & Stuen (1998), Holley (2017), Davies & Devlin (2007), Khan et al. (2023), Kurup et al. (2021), , Manolakelli (2022), Modo & Kinchin (2011), Newell et al. (1990), Stember (1991), Smith & Karr-Kidwell (2000), Wineburg & Grossman (2000), Holley (2009), Franks et al. (2007), Woods (2007), Chen et al. (2021), Farrow et al. (2024), Oliveira et al. (2024), Reilly & Reeves (2023)
Clear objectives	Program objectives must be clearly defined, measurable, and aligned with the context of the university.	
Scientific program design	The program should be designed scientifically, ensuring logical coherence among courses, activities, and expected outcomes.	
Student involvement	Students should be involved in the design, implementation, and evaluation processes to ensure the program meets their needs and expectations.	
Continuous assessment and improvement	The program should undergo regular evaluation and improvement based on evidence of its effectiveness, feedback from students and faculty, and changes in the educational landscape.	

(Source: Based on Scopus database, edited by the authors)

Studies suggest that the success of IDPs bases on several critical factors. Foremost among these is institutional commitment. Strong support and adequate investment in financial, human, and physical resources are prerequisites for maintaining the sustainability and growth of such programs (Cottafava et al., 2022). Equally important is the need for clearly defined and measurable program objectives that align with the specific educational context of the university. These objectives provide a clear direction for teaching and learning activities (Khan et al., 2023; Kurup et al., 2021). A scientifically grounded program design is essential, ensuring logical coherence between courses, activities, and intended outcomes. This approach not only maintains program consistency but also optimizes the learning experience for students (Biggs & Tang, 2011). Additionally, active student involvement in the design, implementation, and evaluation phases is crucial. Listening to students' needs and feedback ensures that the program remains relevant and practical (Wineburg & Grossman, 2000; Woods, 2007).

Finally, continuous assessment and improvement are indispensable for sustaining program quality. Evaluation processes should be evidence-based, incorporating practical insights on teaching effectiveness, feedback from students and faculty, and emerging trends in the educational landscape. This ensures that the program evolves to meet new demands and challenges (Newell, 2007; Davies & Devlin, 2007).

The integration of these factors provides a robust foundation for the success of IDPs, enabling them to address complex challenges effectively and contribute to the advancement of education and society.

4. Conclusion and Recommendations

The findings of this study reaffirm the significance of IDPs in addressing the demands of modern society and tackling complex challenges. These programs equip students not only with essential knowledge and skills but also with critical thinking abilities, problem-solving capabilities, and adaptability to dynamic, diverse work environments. However, implementing IDPs presents substantial challenges, including coordination among departments, the need for flexibility in program design, and ensuring the competency of faculty members. Overcoming these challenges requires strong institutional commitment, close collaboration among stakeholders, and the application of scientific methods in program design and operation.

Based on the study's findings, several key recommendations are proposed for universities in designing, implementing, and evaluating IDPs: 1) Establish a clear vision for the role of IDPs within the university's strategic development plan; 2) Foster a collaborative environment among departments and faculty members to support interdisciplinary education; 3) Invest in faculty development to enhance their capabilities in teaching interdisciplinary courses; 4) Design programs scientifically, ensuring flexibility and alignment with student needs and labor market

demands; 5) Adopt appropriate assessment methods to measure program effectiveness comprehensively; 6) Implement continuous evaluation and improvement processes to maintain the quality and efficacy of the programs.

The design and operation of IDPs represent a crucial and necessary trend in contemporary higher education. Developing such programs not only meets educational demands but also plays a pivotal role in enhancing the competitiveness of universities. In the context of international integration and a rapidly changing labor market, universities must swiftly embrace this trend to strengthen their positions. IDPs provide students with diverse skills and practical value while

fostering innovation and creativity in the academic environment, contributing significantly to societal development.

However, successful implementation requires meticulous preparation, strong coordination, and commitment from all stakeholders. This study offers a comprehensive overview of these issues, serving as a foundation for future research and providing specific recommendations for universities aiming to build and advance high-quality IDPs.

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