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FACULTY PERCEPTIONS AND BARRIERS IN INTERDISCIPLINARY CURRICULUM IMPLEMENTATION: A QUANTITATIVE STUDY

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Abstract
This paper explores faculty members' perceptions and barriers regarding the implementation of an interdisciplinary curriculum at the higher education level. The study aimed to assess faculty members' views on incorporating interdisciplinary approaches into the existing curriculum and identify the perceived barriers to implementation. A quantitative research design was used, with data collected through a structured questionnaire administered to faculty members at the International Islamic University Islamabad, National University of Modern Languages (NUML) Islamabad, and Arid University Rawalpindi. A random sampling technique was applied, achieving a 50% (27 teachers) response rate. Results indicated that faculty generally supported interdisciplinary approaches, with positive perceptions of curriculum integration; however, significant barriers, including administrative challenges, a lack of faculty training, and insufficient resources, were also identified. Based on these findings, it is recommended that universities invest in faculty development, provide adequate resources, and create platforms for cross-departmental collaboration to enhance interdisciplinary education.

Keywords: Interdisciplinary, Curriculum, Interdisciplinary Curriculum, Higher Education

Introduction

The integration of interdisciplinary approaches into university curricula provides a significant opportunity for addressing global challenges, but it is not without significant obstacles. Scholars recognize the potential benefits of interdisciplinary pedagogy, particularly in strengthening critical thinking and encouraging students to tackle complex, real-world problems. However, the integration of diverse disciplinary perspectives into instructional design is often hindered by entrenched disciplinary boundaries and institutional inertia. Educators face challenges such as the significant time commitment required to create interdisciplinary modules, concerns about the dilution of disciplinary knowledge, and the difficulty of integrating curricula across multiple domains (Becher & Trowler, 2001; Repko, 2008).

These barriers are exacerbated by institutional structures that favour disciplinary silos and the lack of collaborative spaces (Klein, 2010), which prevent faculty from cross-disciplinary collaboration to develop a coherent vision of interdisciplinary education.

This study addresses the gap in understanding the challenges faculty face when integrating interdisciplinary approaches in higher education (Ripley & Markauskaitė, 2024). It will explore barriers related to institutional structures, faculty perceptions, and different ways of knowing, using a quantitative approach to identify factors that facilitate or hinder interdisciplinary teaching (Xu et al., 2022). The findings aim to inform strategies and policies to foster collaboration and improve the integration of interdisciplinary curricula across universities (Chew, 2021; Li et al., 2025).

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Research objectives

The objectives of the study were:

1. To measure faculty members' perceptions regarding the incorporation of an interdisciplinary approach in the existing curriculum.
2. To examine the extent and nature of the barriers perceived by faculty members in implementing an interdisciplinary approach.

Research Questions

Research questions of the study were:

1. What are the perceptions of faculty members regarding the incorporation of an interdisciplinary approach in the existing curriculum?
2. What is the extent of the barriers perceived by faculty members in implementing an interdisciplinary approach?

Background of the Study

Faculty attitudes toward interdisciplinary teaching are shaped by a variety of factors, including their own experiences with interdisciplinary work, the level of institutional support, and the perceived benefits for student learning. Teachers who have not received proper training or professional development in collaborative teaching methods may feel unprepared to implement interdisciplinary approaches and thus resist change (Lattuca, 2001). Faculty members also report concerns about the tension between the depth of knowledge in their own discipline and the breadth required by interdisciplinary teaching, which can undermine the academic rigor of their subject matter (Becher & Trowler, 2001). In addition, the lack of incentives for cross-departmental collaboration and organizational barriers within institutions limit faculty willingness to participate in interdisciplinary teaching. As a result, teachers require specific institutional support to overcome these challenges and successfully incorporate interdisciplinary approaches into their teaching (Klein, 2010).

Furthermore, the fact that explicit institutional guidelines are not adequately developed and that sufficient resources are not provided to interdisciplinary education is an urgent problem. Faculty members frequently complain that their existing workloads prevent them from spending sufficient time on designing and coordinating interdisciplinary work, as they continue to be overwhelmed by discipline-specific instructional demands (Lattuca, 2001). These problems are further exacerbated by institutional structures that prioritize departmental independence and adhere to rigid, siloed academic models, rendering interdisciplinary work unfeasible for a significant proportion of faculty (Klein, 2010). The absence of such support thus underscores the urgent need for the provision of resources, training, and collaborative platforms that enable faculty to adopt interdisciplinary pedagogical approaches. Without these supports, faculty might still cling to old disciplinary approaches, and interdisciplinary education will be unable to improve student learning or equip graduates to meet the complex demands of the modern world.

When dealing with these barriers, it is essential to understand how the disciplinary backgrounds and experiences of faculty members impact their readiness to participate in interdisciplinary teaching. Ye and Xu (2023) argue that interdisciplinary education can help individuals acquire the necessary skills, including critical thinking, communication, and collaboration skills, which are essential for success in a rapidly changing global world. Interdisciplinary teaching can help overcome institutional and professional barriers, developing 21st-century skills required to meet global challenges and equip students for diverse professional settings (Güven & Alpaslan, 2022). This research aims to understand how institutions can more effectively support faculty in adopting interdisciplinary methods,

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enabling students to address complex, interrelated problems (Patel et al., 2024). By addressing the obstacles to interdisciplinary teaching, student outcomes will improve, and this will also contribute to the development of a more collaborative, innovative, and responsive education system.

The importance of interdisciplinary education, which combines knowledge from various disciplines to solve everyday problems, is becoming increasingly significant in the context of the complex challenges of the 21st century (Holley, 2017). This methodology enables students to learn problem-solving and creative thinking by transcending conventional disciplinary boundaries (Ye & Xu, 2023; Ripley & Markauskaitė, 2024). It enhances scientific literacy, enabling students to consider real-life issues from different perspectives (Güven & Alpaslan, 2022). Genuine interdisciplinarity transcends the integration of subjects; it fosters a more profound understanding and application (Herlinawati et al., 2024). The purpose of this study is to evaluate the faculty perceptions of these barriers and determine the challenges and facilitators that they face when implementing interdisciplinary approaches (Mirbahai et al., 2024). The results will provide insight into how institutions can support faculty and overcome these obstacles to create a more integrated learning environment (Ripley & Markauskaitė, 2024).

Despite the recognized benefits of interdisciplinary education, there is still a gap in empirical evidence on its implementation, particularly regarding faculty engagement and institutional support (Feng et al., 2023; Mirbahai et al., 2024). By addressing this gap, the study will contribute to policy decisions that promote interdisciplinary curricula, helping universities adapt to the complex challenges of the modern world (Abbonizio & Ho, 2020).

Benefits of Interdisciplinary Approaches

Teachers play a crucial role in promoting interdisciplinary approaches to address complex challenges such as poverty, climate change, and political instability. By integrating knowledge from diverse fields like economics, environmental science, political science, and public health, educators can help students understand the interconnectedness of these issues and develop comprehensive strategies for addressing them (Rana et al., 2025). Interdisciplinary education also bridges the gap between theoretical knowledge and practical applications, enabling students to implement real-world solutions across sectors like engineering, business, and healthcare (Zavodnick et al., 2025). Additionally, it fosters critical thinking, innovation, and collaboration, as students engage with multiple disciplines, building essential skills such as communication, negotiation, and leadership (Matuk et al., 2024). This approach aligns with Pakistan's Vision 2025, helping teachers prepare students to contribute to national development goals, such as sustainable cities and infrastructure, while promoting tolerance and empathy in addressing societal and cultural issues (Liu et al., 2022). Ultimately, interdisciplinary education supports a more inclusive, innovative, and adaptable system that benefits both students and society.

Barriers to Implementing Interdisciplinary Approaches

From a teacher's perspective, implementing interdisciplinary education in higher education poses significant challenges that need to be addressed for successful integration. One major hurdle is the strong disciplinary boundaries and institutional resistance, which make it difficult to introduce change (Rodríguez et al., 2024). The different approaches each discipline takes to knowledge further complicate collaboration (Geil et al., 2023). Teachers often face difficulties in helping students integrate information from multiple disciplines, as the division of knowledge into separate subjects' limits students' ability to apply what they learn to real-world problems (Güven & Alpaslan, 2022). Assessing learning in interdisciplinary contexts is

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also challenging, as it requires balancing multiple disciplines without overemphasizing one (Carrillo-Nieves et al., 2024). Additionally, communication barriers arise from differences in disciplinary language and terminology, making it essential for educators to establish common vocabularies for effective collaboration (Geil et al., 2023; Li et al., 2025).

In the case of faculty members, interdisciplinary approaches need to be integrated by breaking the barriers of training, experience, and institutional support. Most faculty members lack the required training and preparation in interdisciplinary teaching, as they are experts in their respective fields (Repko, 2008). The shift to the interdisciplinary model may be overwhelming because it requires new instructional methods and cooperation with the representatives of other disciplines (Lattuca, 2001). There is also the issue of faculty members having to balance the depth of content in their own field with the breadth of interdisciplinary teaching, and the fear that interdisciplinary methods will undermine academic rigor (Becher & Trowler, 2001). Additionally, institutional backing is often lacking, and departmental structures are inflexible, with scarce resources to support interdisciplinary efforts. Such obstacles may deter faculty members from adopting interdisciplinary strategies, as their current workload and institutional limitations prevent them from successfully participating in interdisciplinary curriculum development (Klein, 2010). These issues are crucial to overcome in order to promote the use of interdisciplinary teaching and establish a climate that supports collaborative learning.

Faculty Perceptions on Interdisciplinary Education

Faculty perceptions are crucial for successfully implementing interdisciplinary curricula, as their attitudes influence teaching practices and curriculum design (Weldingh et al., 2024). Their willingness to engage in inter-disciplinary collaboration and use diverse methods is key to creating an environment that supports complex problem-solving (Velmurugan et al., 2023; Amelink et al., 2023). A major challenge, however, is overcoming institutional structures that focus on specialized knowledge rather than promoting integrative platforms for sharing ideas (Chew, 2021). This resistance often stems from differences in how discipline's view knowledge and reality, making collaboration difficult (Winther et al., 2021). Additionally, faculty sometimes find interdisciplinary work cumbersome and inefficient, which can make them hesitant to adopt these approaches (Amelink et al., 2023).

Despite the significance of interdisciplinary teaching in addressing complex real-world issues and training critical thinking, little information exists on how to design programs that can effectively combine knowledge across disciplines (Ripley & Markauskaitė, 2024). There is a lack of lessons in institutions that have successfully implemented such programs, which complicates their broader implementation (Haase et al., 2023). It is not easy to plan and evaluate the success of interdisciplinary learning without clear strategies (Ripley & Markauskaitė, 2024). There is also a tendency for students to struggle with integrating information across disciplines, which is why teaching methods that explicitly encourage interdisciplinary thinking are necessary (Spelt et al., 2009). The literature on the practical strategies to assist students in integrating knowledge and acquiring complex thinking skills has a gap (Amelink et al., 2023; Ye & Xu, 2023). Also, there is a lack of research on the faculty views and their leadership in interdisciplinary efforts (Routhe et al., 2024).

Figure 4.1

General Perceptions of the Interdisciplinary Approach

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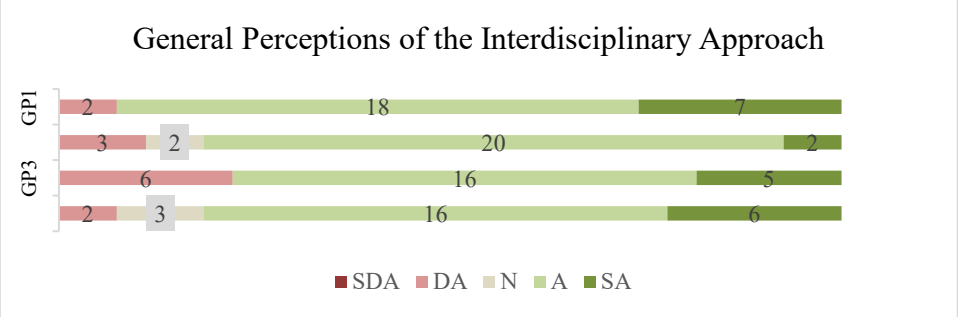

Above Figure 4.1 presents faculty perceptions of the interdisciplinary approach in the curriculum. Most of the respondents believe that the approach has been effectively integrated, with a mean score of 4.11 for its incorporation. Most participants also feel that the curriculum encourages the application of knowledge from multiple disciplines (mean score of 3.8) and is relevant for addressing real-world challenges (mean score of 3.74). Additionally, a positive perception of its impact on student learning outcomes (mean score of 3.96) was observed, with only a small number of respondents expressing disagreement. Overall, the responses highlight a favourable view of interdisciplinary learning.

Figure 4.2

Curriculum Design and Structure

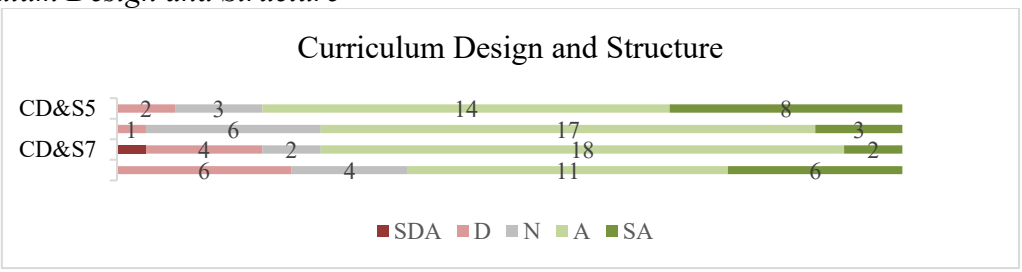

Figure 4.2 presents faculty perceptions of the "Curriculum Design and Structure" regarding interdisciplinary integration. Statement CD&S5, with a mean score of 4.04, indicates strong agreement on the curriculum's ability to integrate multiple disciplines. Statement CD&S6, scoring 3.81, reflects a positive but slightly less enthusiastic view of interdisciplinary course offerings. Statement CD&S7, with a mean score of 3.59, highlights concern about flexibility in course selection, while CD&S8, with a score of 3.63, shows moderate agreement on the emphasis of interdisciplinary content in core subjects.

Figure 4.3

Teaching Methods and Faculty Engagement

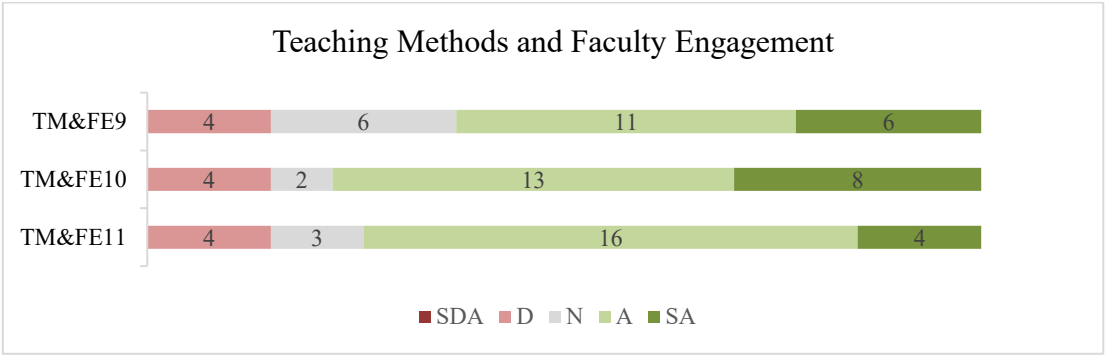

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Figure 4.3 shows faculty perceptions of teaching methods and interdisciplinary collaboration. Statement TM&FE9, with a mean score of 3.70, indicates moderate agreement on providing interdisciplinary collaboration opportunities, though perceptions vary. Statement TM&FE10, with a higher mean of 3.93, shows strong agreement on faculty collaboration across disciplines. Statement TM&FE11, with a mean score of 3.74, suggests moderate agreement on faculty training for interdisciplinary knowledge, with some variation in perceptions of its effectiveness.

Figure 4.4

Overall Perception of Interdisciplinary Approach

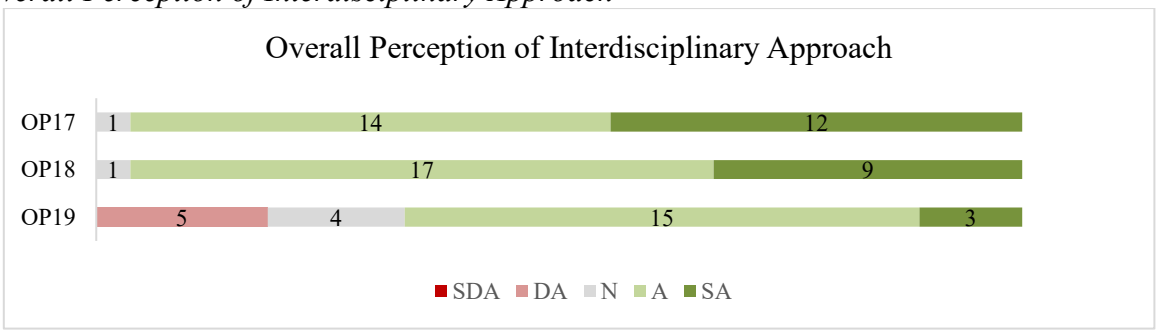

Figure 4.5 highlights the overall perception of the interdisciplinary approach. Statement OP17, with a mean score of 4.41, shows strong support for further incorporating interdisciplinary elements into the curriculum. OP18, with a mean score of 4.30, suggests a favourable recommendation for more interdisciplinary courses, though some respondents remain neutral. OP19, with a lower mean of 3.59, indicates moderate satisfaction, reflecting mixed opinions about the current level of interdisciplinary integration in the curriculum.

Figure 4.5

Benefits And Challenges of The Interdisciplinary Approach

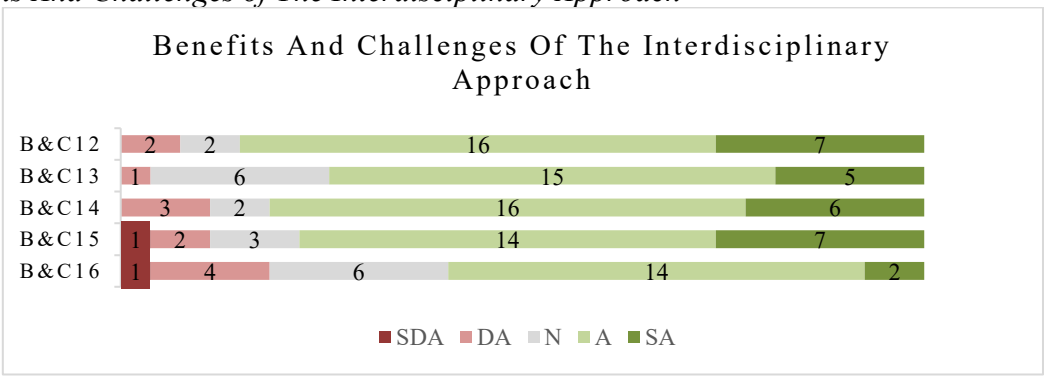

Figure 4.4 highlights the benefits and challenges of the interdisciplinary approach. Most respondents felt that it expanded their knowledge (mean 4.04) and enhanced their critical thinking (mean 3.93), although some remained neutral. While the approach was seen as valuable for complex tasks (mean 3.89), challenges such as varying expectations across disciplines (mean 3.89) and time management (mean 3.44) were acknowledged but not viewed as major obstacles.

Figure 4.4

Barriers Related to Curriculum Design and Structure

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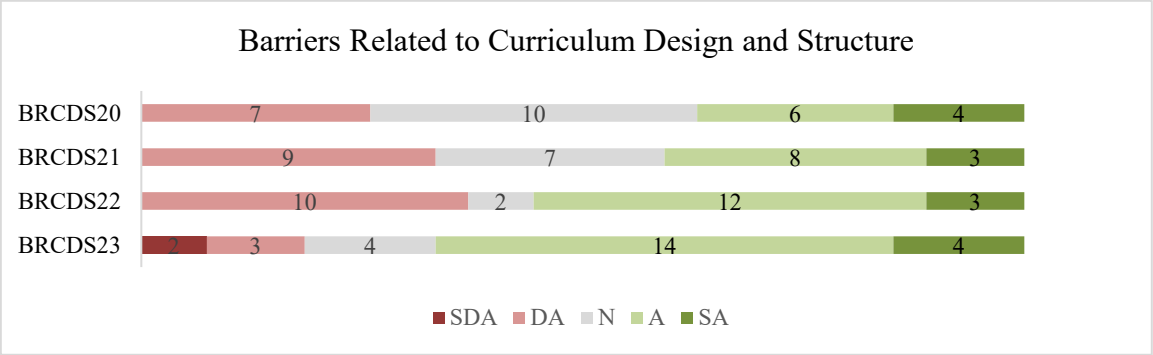

Figure 4.6 presents barriers to interdisciplinary integration in the curriculum. The most significant barrier, with the highest mean score of 3.56, is related to administrative policies and procedures, with 14 respondents agreeing. The lack of flexibility in the curriculum (mean 3.30) and insufficient interdisciplinary courses (mean 3.19) were also noted as concerns, though less strongly. Additionally, the rigidity of the current curriculum (mean 3.26) was perceived as a moderate barrier, with mixed responses from respondents.

Figure 4.5

Barriers Related to Faculty and Institutional Support

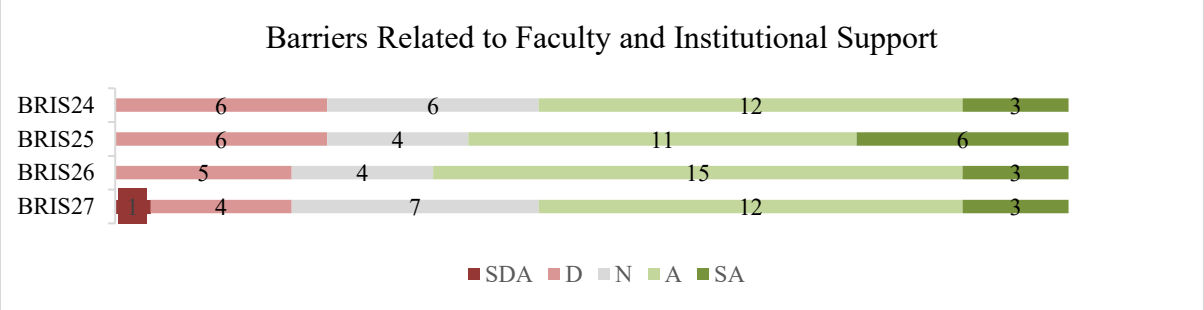

Figure 4.7 highlights barriers related to faculty and institutional support for interdisciplinary teaching. The responses show moderate agreement, with the highest mean score of 3.63 for the lack of collaboration between faculty members. Training for teaching interdisciplinary courses and institutional support were viewed neutrally by most respondents (mean scores of 3.44 and 3.59, respectively). Additionally, difficulties in coordinating interdisciplinary courses due to departmental constraints (mean 3.44) were also noted, with most responses remaining neutral or showing mild disagreement.

Figure 4.6

Barriers Related to Resources and Infrastructure

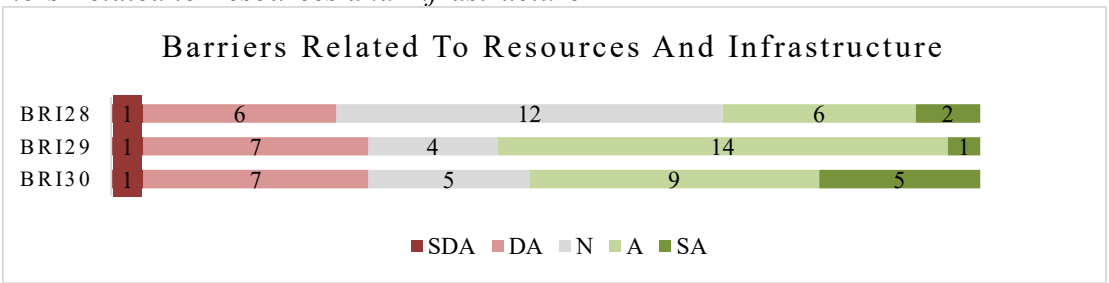

Figure 4.8 highlights barriers related to resources and infrastructure for interdisciplinary programs. The responses indicate moderate agreement, with financial

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resources (mean 3.07) and infrastructure (mean 3.26) being seen as significant challenges, though many respondents were neutral or disagreed. The lack of teaching materials (mean 3.37) was also identified as a notable barrier, with a larger proportion of respondents agreeing that the resources were inadequate. These findings suggest that resource constraints are key obstacles to supporting interdisciplinary programs.

Figure 4.7

Barriers Related to Student Preparedness and Engagement

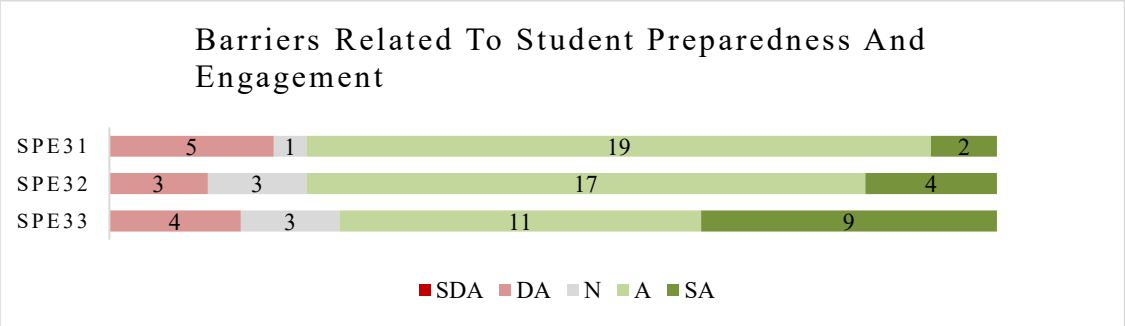

Figure 4.9 highlights barriers related to student preparedness and engagement in interdisciplinary courses. The data shows moderate agreement on the lack of background knowledge (mean 3.67) and insufficient motivation (mean 3.81). The most significant concern is the higher workload in interdisciplinary courses (mean 3.93), which many respondents find challenging to balance, indicating substantial barriers to student engagement and preparedness.

Figure 4.8

Perception of Future Improvements

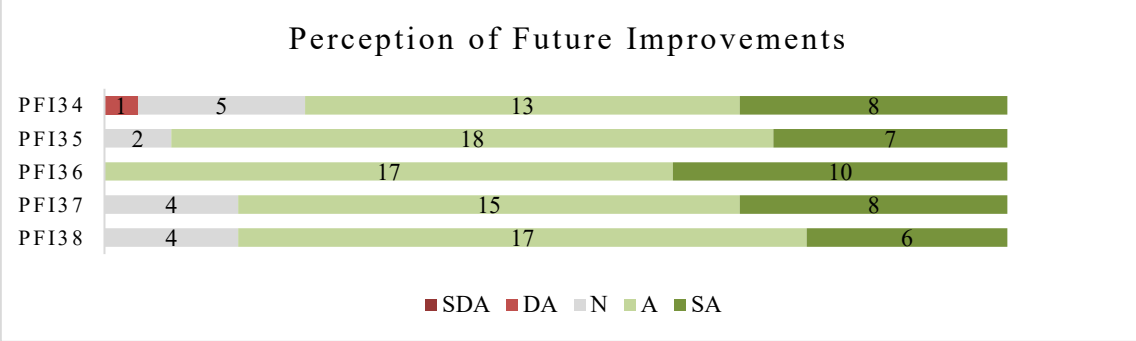

Figure 4.10 presents perceptions of future improvements for interdisciplinary courses, with strong support for faculty training (mean 4.04) and increased resources (mean 4.37). There is also strong agreement on the need for more flexibility in curriculum design (mean 4.19) and better departmental collaboration (mean 4.15). However, administrative barriers (mean 4.07) and curriculum flexibility remain concerns, with some respondents expressing disagreement. The data suggest a general preference for enhancing faculty development, resources, and collaboration to improve interdisciplinary education.

Discussion

The data presented in this study reflect faculty perceptions of interdisciplinary teaching approaches, highlighting both the positive views and significant challenges in implementing these methods. Respondents expressed a strong belief in the value of interdisciplinary integration, particularly in terms of curriculum design (mean 4.11), knowledge expansion (mean 4.04), and its relevance to real-world problems (mean 3.74). These findings align with

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previous literature that emphasizes the importance of interdisciplinary education in fostering critical thinking, problem-solving, and collaboration skills (Ye & Xu, 2023; Ripley & Markauskaitė, 2024). Faculty recognize that such education is essential for addressing complex, global challenges (Güven & Alpaslan, 2022), which aligns with the current educational push to prepare students for diverse professional environments (Matuk et al., 2024).

However, faculty members also identified barriers to the effective integration of interdisciplinary approaches. Issues such as the lack of flexibility in course selection (mean 3.59), administrative hurdles (mean 3.56), and insufficient faculty training (mean 4.04) were noted. These concerns are consistent with findings from Lattuca (2001), who argued that inadequate professional development in interdisciplinary teaching often leads to resistance from faculty members. Furthermore, Becher & Trowler (2001) discussed the challenge of balancing disciplinary depth with the breadth required by interdisciplinary curricula, a concern echoed by respondents in this study who feared that interdisciplinary approaches might compromise academic rigor.

The study also revealed faculty's strong support for enhancing resources (mean 4.37), fostering collaboration across departments (mean 4.15), and increasing the number of interdisciplinary courses (mean 4.30). These suggestions align with Lattuca's (2001) call for increased institutional support, including resources and incentives, to facilitate cross-departmental collaboration and overcome the organizational barriers that hinder interdisciplinary work. Similarly, Klein (2010) highlighted the critical role of institutional structures in supporting interdisciplinary education. Without such support, faculty members may continue to prioritize their disciplinary-specific responsibilities, leaving little room for collaborative teaching and learning.

Faculty concerns regarding workload (mean 3.93) and inadequate infrastructure (mean 3.26) further illustrate the difficulties in implementing interdisciplinary approaches. These findings resonate with the challenges described by Rodríguez et al. (2024), who identified faculty workload and institutional resistance as significant barriers.

Additionally, Geil et al. (2023) emphasized the importance of creating a common vocabulary to overcome communication barriers between disciplines. Faculty in this study expressed similar concerns about navigating disciplinary differences and aligning teaching strategies across diverse fields.

While the data suggest that faculty are generally optimistic about the potential of interdisciplinary education, the barriers identified point to the need for substantial improvements. The current study's findings underscore the importance of addressing these challenges through targeted interventions such as faculty training, increased collaboration opportunities, and flexible curriculum design. These recommendations align with the work of Mokoka et al. (2023), who advocated for institutions to establish clear strategies and platforms for interdisciplinary collaboration.

In conclusion, the positive outlook on interdisciplinary education in this study reflects a growing recognition of its value in enhancing student learning and facilitating real-world problem-solving. However, the barriers related to institutional support, workload, and faculty training must be addressed to ensure the successful implementation of interdisciplinary approaches. Future research should investigate specific strategies to mitigate these barriers and equip faculty with the necessary resources and support to integrate interdisciplinary teaching into their practices. Furthermore, studies focusing on faculty leadership roles in interdisciplinary initiatives and the development of best practices for interdisciplinary

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curriculum design are needed to fill the gaps in the existing literature (Ripley & Markauskaitė, 2024).

Recommendations

To address faculty concerns about interdisciplinary teaching, universities should invest in targeted professional development programs focused on collaborative methods and curriculum design. Additionally, institutions need to provide more resources and administrative support to foster interdisciplinary courses and reduce faculty workload. Creating collaborative teaching environments, both physically and virtually, along with offering incentives for cross-departmental collaboration, will further support the integration of interdisciplinary education.

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