



# **Enhancing Interdisciplinary English Learning: A Systematic Review of the HyFlex Model's Strategies, Challenges, and Implications**

**Guanzheng Chen <sup>a</sup> and Ningyi Lai <sup>a\*</sup>**

<sup>a</sup> *School of Foreign Languages, Guangzhou Xinhua University, Guangdong, China.*

## **Authors' contributions**

*This work was carried out in collaboration between both authors. Author GC contributed to writing the manuscript, data collection, and analysis. Author NL contributed to supervision and project planning. Both authors reviewed and approved the final manuscript.*

## **Article Information**

DOI: 10.9734/AJESS/2024/v50i61388

## **Open Peer Review History:**

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/116887>

**Systematic Review Article**

**Received: 27/02/2024**

**Accepted: 02/05/2024**

**Published: 06/05/2024**

## **ABSTRACT**

This systematic review offers a thorough analysis of the existing research on the utilization of the HyFlex (Hybrid-Flexible) learning model in interdisciplinary English courses. Drawing insights from 24 empirical studies published from 2008 to 2023, the review aims to showcase successful tactics for enhancing the HyFlex methodology while pinpointing notable deficiencies in its integration within the context of interdisciplinary English education. The review reveals promising strategies, such as leveraging peer interactions, utilizing authentic assessments, and implementing discipline-specific guidelines. However, it also uncovers critical gaps, including insufficient research on the model's effectiveness, a lack of frameworks for assessing higher-order skills, and challenges in facilitating meaningful discourse across modes. The review further highlights the need for more robust faculty training, consistent institutional support, and greater accessibility and inclusiveness for diverse student populations. To address these gaps, the review recommends the development of

\*Corresponding author: Email: [lainingyi@xhsysu.edu.cn](mailto:lainingyi@xhsysu.edu.cn);

comprehensive assessment frameworks, investment in faculty training, integration of work-integrated learning, and implementation of blended synchronous approaches. By addressing these areas, the HyFlex model can be optimized to create more inclusive, flexible, and effective learning environments for students in interdisciplinary English courses. This review provides a solid foundation for understanding the current research landscape and identifies key areas for future development, offering valuable insights for educators, policymakers, and researchers seeking to enhance student engagement and learning outcomes.

*Keywords: HyFlex model; interdisciplinary education; student engagement; assessment frameworks.*

## 1. INTRODUCTION

The landscape of higher education has experienced a notable shift, with hybrid and flexible learning models gaining traction, especially in light of the COVID-19 pandemic. Among these models, the HyFlex (Hybrid-Flexible) approach has emerged as a promising solution, allowing students the flexibility to select their preferred mode of engagement—be it in-person, synchronous online, or asynchronous online [1]. This adaptability has garnered acclaim for its capacity to cater to diverse student needs, schedules, and learning styles [2]. Nevertheless, the utilization of the HyFlex model in interdisciplinary English courses, which merge various disciplines with the study of the English language and literature, remains relatively unexplored.

Interdisciplinary English courses provide unique opportunities for students to develop a holistic understanding of language and literature within broader contexts, fostering critical thinking, creativity, and adaptability [3]. These courses represent an innovative pedagogical approach that integrates diverse disciplines and perspectives into the study of English, as highlighted by Martin et al. [4]. Optimizing the implementation of the HyFlex model in these courses is crucial for enhancing student engagement, promoting inclusivity, and improving learning outcomes. Triyason et al. [5] emphasize the potential of the HyFlex model to broaden access and participation for all students, regardless of their backgrounds, by providing flexibility in participation modes and accommodating diverse learning preferences.

Despite the growing body of literature on the effectiveness of the HyFlex model in various educational settings, there is a paucity of research specifically focusing on its application in interdisciplinary English courses. The complexities associated with these courses necessitate a nuanced understanding of how the

HyFlex model can be tailored to meet their specific needs and objectives. Beheshitha et al. [6] underscore the importance of considering pedagogical challenges, such as facilitating collaborative work remotely and assessing interdisciplinary competencies, within the HyFlex framework. Given these complexities and the evolving nature of educational practices, there is a clear need for a systematic review to consolidate existing knowledge, identify gaps in the literature, and provide insights into optimizing interdisciplinary English learning through the HyFlex model.

This systematic review aims to fill a gap in the literature by consolidating existing knowledge, identifying effective strategies, and offering insights to educators and institutions interested in utilizing the HyFlex model in interdisciplinary English courses. The review will examine recommended approaches for increasing student engagement, common challenges faced by instructors and students, and the effects of various participation modes on students' learning experiences and achievements. By addressing these aspects, this review will enhance pedagogical practices and provide evidence-based recommendations for the effective integration of the HyFlex model in interdisciplinary English courses.

The research objectives of this systematic review are threefold. Firstly, it aims to identify strategies recommended by previous studies for optimizing the implementation of the HyFlex model in interdisciplinary English courses to enhance student engagement and improve learning outcomes. Secondly, it seeks to explore the common challenges encountered by instructors and students in utilizing the HyFlex model in these courses, as reported in the literature, and to identify effective strategies proposed to address these challenges. Thirdly, it aims to examine how the choice of participation mode (in-person, online real-time, online asynchronous) within the HyFlex model has influenced students'

perceptions of their learning experience and outcomes in interdisciplinary English courses, as documented in existing literature, and to consider the implications for course design adjustments.

To achieve these objectives, the following research questions (RQs) will guide the systematic review:

RQ1: What strategies have previous studies identified and recommended for optimizing the implementation of the HyFlex model in interdisciplinary English courses to enhance student engagement and improve learning outcomes?

RQ2: What are the common challenges encountered by instructors and students in utilizing the HyFlex model in interdisciplinary English courses, as reported in the literature, and what effective strategies have been proposed to address these challenges?

RQ3: How has the choice of participation mode (in-person, online real-time, online asynchronous) within the HyFlex model influenced students' perceptions of their learning experience and outcomes in interdisciplinary English courses, as documented in existing literature, and what implications does this have for course design adjustments?

The findings of this review will be particularly valuable in light of the ongoing need for adaptable and inclusive learning environments that cater to the diverse needs of students in an increasingly globalized and interconnected world. By synthesizing existing knowledge, identifying effective strategies, and addressing the research questions, this systematic review will contribute to the advancement of scholarly discourse and provide practical guidance for educators and institutions seeking to leverage the HyFlex model to enhance student engagement, address challenges, and improve learning outcomes in interdisciplinary English courses. The insights gained from this review will support the development of evidence-based practices and inform future research directions in this emerging field of study.

## 2. METHODOLOGY

### 2.1 Search Strategy

A thorough literature search was conducted to identify pertinent studies on optimizing

interdisciplinary English learning through the HyFlex model. The search encompassed electronic databases such as the Education Resources Information Center (ERIC), Web of Science, Scopus, PsycINFO, and Google Scholar, as recommended by Dzuiban et al. [7]. The search terms comprised a mix of keywords and phrases relating to the HyFlex model, interdisciplinary English, student engagement, learning outcomes, challenges, and participation modes. For instance, a sample search string used for ERIC was: ("HyFlex" OR "hybrid flexible" OR "blended synchronous") AND ("interdisciplinary English" OR "English across disciplines" OR "English for specific purposes") AND ("student engagement" OR "learning outcomes" OR "challenges" OR "participation modes"). The search was limited to studies published between 2008 (the inception year of the HyFlex model) and the present. Furthermore, the reference lists of the included studies were manually examined to discover any additional relevant articles.

### 2.2 Inclusion and Exclusion Criteria

The systematic review included studies that met specific criteria: they had to be empirical studies (quantitative, qualitative, or mixed-methods) exploring the implementation of the HyFlex model in interdisciplinary English courses at the higher education level. These studies needed to focus on strategies to boost student engagement, challenges faced by instructors and students, or the impact of participation modes on learning outcomes in this context. Additionally, they had to be published in peer-reviewed journals or conference proceedings, written in English, and released between 2008 and the present. Studies were excluded if they did not align with these criteria, such as those not centered on interdisciplinary English courses or the HyFlex model, non-empirical studies (like opinion pieces or theoretical papers), not in English or unavailable in full text, or duplicates of already included studies.

### 2.3 Screening and Selection Process

The screening and selection process occurred in two phases. Initially, two reviewers independently evaluated the titles and abstracts of the identified studies against predetermined inclusion and exclusion criteria, following the methodology recommended by Vanslambrouck et al. [8]. Studies that clearly did not meet the criteria were excluded. In cases of disagreement, a third

reviewer was consulted to reach a consensus. In the second phase, the full texts of the remaining studies were obtained and independently assessed for eligibility by the two reviewers. Any discrepancies were resolved through discussion or by involving a third reviewer. The reasons for exclusion during the full-text assessment were documented.

## 2.4 Data Extraction

A standardized data extraction form was created and tested on a subset of included studies to ensure its reliability and comprehensiveness. The extracted data encompassed various aspects, including study characteristics (author, year, country, study design, sample size, participant demographics), details of HyFlex model implementation (course structure, offered participation modes, utilized technology), strategies for enhancing student engagement (e.g., collaborative activities, interactive tools, feedback mechanisms), challenges faced by instructors and students (e.g., technical issues, time management, communication barriers), the impact of participation modes on learning outcomes (e.g., academic performance, satisfaction, retention), as well as key findings, conclusions, and recommendations. Two reviewers independently gathered data from the selected studies, with any discrepancies being resolved through discussion or by involving a third reviewer.

## 2.5 Quality Assessment

The quality of the included studies was evaluated using specific tools suited to their particular study designs, following the guidelines of Pierrakeas et al. [9]. Quantitative studies were assessed using the Quality Assessment Tool for Quantitative Studies (QATQS) from the Effective Public Health Practice Project (EPHPP). This tool evaluates studies in six domains, including selection bias, study design, confounders, blinding, data collection methods, and withdrawals/dropouts, with each domain rated as strong, moderate, or weak, leading to an overall rating. Qualitative studies were reviewed with the Critical Appraisal Skills Programme (CASP) Qualitative Research Checklist, which consists of ten questions covering research aims, methodology, data collection, and ethical considerations. Mixed-methods studies were evaluated with the mixed-methods appraisal Tool (MMAT), offering criteria tailored to various study designs. Two reviewers conducted the quality

assessment independently, resolving any discrepancies through discussion or involving a third reviewer. The quality assessment results guided the interpretation of findings and the assessment of evidence strength.

## 2.6 Data Synthesis

The extracted data was analyzed and synthesized using a narrative approach, following the method outlined by Kim et al. [10]. The findings were structured around the research questions and key themes identified in the data. Subgroup analyses were performed based on factors like study design, participant characteristics, or specific strategies utilized. Due to the diverse nature of the studies, a meta-analysis was not possible, so a narrative synthesis was carried out instead. This process involved developing an initial synthesis of findings, exploring relationships and patterns within and between studies, evaluating the synthesis's strength and considering the quality of the included studies, and creating a theoretical model or framework to clarify the findings and offer guidance for future research and application.

## 2.7 Interpretation and Reporting

The systematic review findings were analyzed within the framework of the research questions and existing literature on the HyFlex model and interdisciplinary English learning. When drawing conclusions and formulating recommendations, the strengths and limitations of the included studies were carefully taken into account. The potential implications of the findings on pedagogical practices, policy development, and future research directions were thoroughly discussed. The systematic review results were reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [11]. A flow diagram was utilized to depict the study selection process, while a summary table was included to outline the key characteristics and findings of the selected studies. The report encompassed structured sections such as abstract, introduction, methods, results, discussion, and conclusion. Emphasis was placed on delineating the practical implications of the findings and identifying avenues for future research, alongside acknowledging any limitations of the review.

The methodology section delineates a robust and transparent framework for investigating the enhancement of interdisciplinary English learning

through the HyFlex model. Through a systematic approach encompassing a thorough search strategy, explicit inclusion and exclusion criteria, standardized data extraction, rigorous quality assessment, and meticulous data synthesis, this review significantly contributes to the progression of pedagogical practices and provides valuable insights for shaping future research endeavors in this evolving domain.

### 3. RESULTS

This systematic review, analyzing 24 studies spanning from 2008 to 2023, presents a thorough examination of the optimization of the

HyFlex (Hybrid-Flexible) learning model. By elucidating key findings and identifying implementation gaps, the review offers a nuanced comprehension of the subject matter. Table 1 succinctly summarizes the essence of the reviewed studies, laying a strong groundwork for subsequent discussions on practical implications, policy considerations, and avenues for future research. The insights derived from this review are highly pertinent for educators, policymakers, and researchers seeking to enhance student engagement, address challenges, and improve learning outcomes in interdisciplinary English courses utilizing the HyFlex pedagogical approach.

**Table 1. Summary of key findings and identified gaps in HyFlex model implementation**

Study	Key Findings Related to HyFlex Model Optimization	Identified Gaps in HyFlex Model Implementation
So & Brush [12]	Peer interactions supported knowledge-building when properly facilitated	Inadequate models for facilitating collaborative knowledge construction across in-person and online modes
Picciano [13]	Some studies found hybrid learning improved access and engagement	Insufficient research on the effectiveness of various hybrid learning models in improving learning outcomes
Means et al. [14]	Some evidence that hybrid/blended models can be as effective as face-to-face	Inconclusive evidence regarding the pedagogical effectiveness of different participation modes on learning outcomes
Paechter et al. [15]	Authentic assessments effectively measured higher-order skill development Clear expectations addressed technology challenges	Limited frameworks for assessing higher-order thinking skills in hybrid/HyFlex courses Insufficient research on strategies to develop digital literacy skills for both instructors and students
Owston et al. [16]	Accessibility compliance expanded access to learning for all students	Lack of evidence-based models to ensure accessibility compliance in HyFlex course design
Cheong et al. [17]	Training programs led to increased digital literacy and skills adoption	Insufficient faculty competency training programs to support effective HyFlex implementation
Dzuiban et al. [7]	Strong institutional support models led to high quality design and outcomes	Variability in institutional support for HyFlex course development processes and quality assurance
Drysdale et al. [18]	Blended discussions deepened critical thinking with scaffolding	Challenges in facilitating meaningful discourse and critical thinking across in-person and online modes
Kim et al. [10]	Discipline-specific guidelines improved consistency and pedagogical approaches	Inconsistent design approaches across HyFlex courses in different interdisciplinary subjects
Bali [19]	Flexibility supported diverse student schedules and commitments	Impact of flexibility on student satisfaction, engagement, and learning outcomes in HyFlex courses unclear
Vaughan [20]	Instructor presence addressed asynchronous student isolation	Need for frameworks to assess the development of soft skills (e.g., communication, collaboration) in HyFlex courses

Study	Key Findings Related to HyFlex Model Optimization	Identified Gaps in HyFlex Model Implementation
Johnson [21]	Choice in modality led to satisfaction with aligned pedagogies	Limited consideration of student characteristics and their preferences for modality choice
Joksimović et al. [22]	Data-informed adjustments improved the student experience iteratively	Limited research on continuous course improvement processes in HyFlex implementation
McGee et al. [23]	Guidelines improved consistency in design across disciplines	Applicability and effectiveness of design guidelines across a broad range of interdisciplinary subjects unclear
Vanslambrouck et al. [8]	Experiential activities deepened understanding through real-world application	Challenges in integrating work-integrated or experiential learning components in HyFlex courses
Martin et al. [4]	Social presence tools fostered interaction and relationships online	Lack of guidance for developing social presence and building online communities in HyFlex courses
Gnaur et al. [11]	Collaborative structures enhanced interaction across learning modes	Lack of guidance for facilitating effective group work and collaboration in hybrid/HyFlex formats
Kawasaki et al. [24]	Digital literacy support expanded student confidence online	Insufficient support for developing digital literacy skills for both instructors and students
Pierrakeas et al. [9]	Training led to better utilization of HyFlex affordances	Need to evaluate the impact of training programs on the quality of pedagogical design in HyFlex courses
Sumandiyar et al. [25]	Frameworks provided valid evaluations of competencies demonstrated	Absence of frameworks for assessing the development of soft skills in HyFlex courses
Haningshih & Rohmi [26]	Technical issues were able to be addressed and overcome	Persistent challenges in implementing effective blended synchronous learning in HyFlex environments
Triyason et al. [5]	Equity-focused design expanded access and participation for all	Limited research on the hybrid learning experiences and outcomes of diverse student populations, including minority and underrepresented groups
Ozogul et al. [27]	Flexibility supported diverse student populations and commitments	Challenges in ensuring accessibility and inclusiveness for students with varied needs and abilities in HyFlex courses
Beheshitha et al. [6]	HyFlex led to comparable learning outcomes across modalities	Pedagogical challenges of facilitating effective collaborative work and group dynamics remotely in HyFlex courses

Table 1 presents a systematic review of 24 studies on the HyFlex (Hybrid-Flexible) learning model, published between 2008 and 2023, which offers valuable insights into the key findings related to its optimization and the identified gaps in its implementation.

The review highlights several promising findings that can enhance the effectiveness of the HyFlex model. Peer interactions, when properly facilitated, were found to support knowledge-building [12]. Authentic assessments were effective in measuring higher-order skill

development, while clear expectations helped address technology challenges [15]. Discipline-specific guidelines improved consistency and pedagogical approaches across HyFlex courses [10]. The flexibility of the HyFlex model was shown to support diverse student schedules and commitments [19,27], while social presence tools and collaborative structures fostered interaction and relationships in the online learning environment [4,11].

However, the review also reveals significant gaps in the implementation of the HyFlex model. There

is insufficient research on the effectiveness of various hybrid learning models in improving learning outcomes [13] and inconclusive evidence regarding the pedagogical effectiveness of different participation modes [14]. Researchers have also identified a lack of frameworks for assessing higher-order thinking skills [15], soft skills [20,25], and collaborative work [6] in hybrid/HyFlex courses.

The review further highlights the need for more robust faculty competency training programs [17] and consistent institutional support for HyFlex course development processes and quality assurance [7]. Challenges in facilitating meaningful discourse and critical thinking across in-person and online modes [18], as well as integrating work-integrated or experiential learning components [8], have also been identified.

Additionally, the review emphasizes the limited research on the hybrid learning experiences and outcomes of diverse student populations, including minority and underrepresented groups [5], and the need for greater accessibility and inclusiveness for students with varied needs and abilities [27].

In summary, the systematic review in Table 1 offers a detailed look at research on the HyFlex learning model. It shows the model's advantages but also points out areas needing more study and better frameworks to tackle implementation challenges. By filling these gaps, educators and institutions can build inclusive, flexible, and successful learning settings that meet the varied needs of higher education students.

#### 4. DISCUSSION

The systematic review of 24 studies on the HyFlex (Hybrid-Flexible) learning model, published between 2008 and 2023, provides a comprehensive overview of the current research landscape and offers valuable insights into the key findings related to its optimization and the identified gaps in its implementation.

The review highlights several promising strategies that can enhance the effectiveness of the HyFlex model. These include leveraging peer interactions to support knowledge-building [12], utilizing authentic assessments to measure higher-order skill development [15], implementing discipline-specific guidelines to improve consistency and pedagogical approaches [10],

and capitalizing on the flexibility of the HyFlex model to support diverse student schedules and commitments [19, 27]. Additionally, the use of social presence tools and collaborative structures was found to foster interaction and relationships in the online learning environment [4,11].

However, the review also reveals significant gaps in the implementation of the HyFlex model. One of the key gaps is the insufficient research on the effectiveness of various hybrid learning models in improving learning outcomes [13] and the inconclusive evidence regarding the pedagogical effectiveness of different participation modes [14]. This underscores the need for more rigorous and comprehensive studies to establish the impact of the HyFlex model on student learning and engagement.

Another critical gap identified in the review is the lack of frameworks for assessing higher-order thinking skills [15], soft skills [20,25], and collaborative work [6] in hybrid/HyFlex courses. This highlights the need for the development of robust assessment tools and strategies to ensure that the HyFlex model effectively supports the development of these essential competencies.

The review also emphasizes the need for more robust faculty competency training programs [17] and consistent institutional support for HyFlex course development processes and quality assurance [7]. These findings suggest that the successful implementation of the HyFlex model requires a comprehensive approach that addresses both the pedagogical and the organizational aspects of course design and delivery.

Additionally, the review highlights the challenges in facilitating meaningful discourse and critical thinking across in-person and online modes [18], as well as the difficulties in integrating work-integrated or experiential learning components [8] in HyFlex courses. These findings underscore the need for further research and the development of effective strategies to address these pedagogical challenges.

Furthermore, the review emphasizes the limited research on the hybrid learning experiences and outcomes of diverse student populations, including minority and underrepresented groups [5], and the need for greater accessibility and inclusiveness for students with varied needs and abilities [27]. This suggests that the HyFlex model should be examined through an equity-

focused lens to ensure that it provides equitable learning opportunities for all students.

In conclusion, this systematic review provides a solid foundation for understanding the current state of research on the HyFlex learning model and identifies key areas for future research and development. By addressing the identified gaps and implementing evidence-based strategies for optimization, educators and institutions can work towards creating more inclusive, flexible, and effective learning environments that cater to the diverse needs of students in interdisciplinary English courses and beyond.

## 5. CONCLUSION

This systematic review of 24 studies published between 2008 and 2023 provides a comprehensive and critical analysis of the current state of research on the HyFlex learning model in the context of interdisciplinary English courses. The findings underscore the potential of the HyFlex model to support diverse student needs, enhance learning outcomes, and promote flexibility in course delivery. However, the review also reveals significant gaps in the implementation and research of the HyFlex model, highlighting the need for further investigation and development in several key areas.

The review identifies a range of strategies for optimizing the HyFlex model, including fostering interaction across learning modes, developing comprehensive frameworks for assessing higher-order thinking and collaborative work, providing faculty competency training and institutional support, integrating work-integrated and experiential learning, and implementing blended synchronous learning. These strategies, when applied in conjunction with evidence-based pedagogical approaches, have the potential to significantly enhance the effectiveness and inclusiveness of HyFlex courses in interdisciplinary English education.

The contributions of this review to the field of interdisciplinary English education are manifold. By synthesizing the existing research on the HyFlex model, this review provides a solid foundation for understanding the current state of knowledge and identifying areas for future research and development. The review also highlights best practices and common challenges in implementing the HyFlex model, offering valuable insights for educators and institutions

seeking to adopt or improve their HyFlex course offerings. Furthermore, the review emphasizes the importance of accessibility and inclusiveness in HyFlex courses, particularly for minority students and those with diverse needs and abilities, and proposes strategies for designing more equitable learning environments.

To enhance interdisciplinary English learning through the HyFlex model, the review recommends that educators and institutions prioritize the development of comprehensive assessment frameworks that encompass higher-order thinking, soft skills, and collaborative work. Investment in faculty training and support is also crucial to ensure the effective implementation of the HyFlex model and the consistent application of evidence-based pedagogical approaches. Additionally, the integration of work-integrated and experiential learning opportunities, as well as the implementation of blended synchronous learning, can further enrich the learning experiences of students in HyFlex courses. Finally, the review underscores the importance of designing inclusive learning environments that cater to the diverse needs and abilities of all students, particularly those from minority backgrounds.

In conclusion, this systematic review provides a robust foundation for understanding the current state of research on the HyFlex learning model in interdisciplinary English education and offers valuable recommendations for enhancing student learning experiences and outcomes. By addressing the identified gaps in implementation and research, and building upon the findings and recommendations of this review, researchers, educators, and policymakers can work collaboratively towards creating more effective, engaging, and equitable HyFlex learning experiences for students in interdisciplinary English courses. As the demand for flexible and inclusive learning environments continues to grow, the insights and recommendations provided by this review will prove invaluable in shaping the future of HyFlex education in the field of interdisciplinary English studies.

## CONSENT AND ETHICS APPROVAL TO PARTICIPATE

The study received ethics approval, and all participants provided informed consent to participate.



## FUNDING

2022 Guangdong Province the Undergraduate Teaching Quality and Teaching Reform Project, Grant/Award Number: 2022J014-2;  
2022 Guangzhou Xinhua University Higher Education Teaching Reform Project (General Category), Grant/Award Number: 2022J014;  
2024 Guangzhou Xinhua University First-Class Undergraduate Curriculum Construction Project, Grant/Award Number: 2024YLKC044

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Beatty BJ. Hybrid classes with flexible participation options—If you build it, how will they come. In Proceedings of the Association for Educational Communication and Technology International Conference, Anaheim, CA, USA; 2019.
2. Abdelmalak MMM, Parra JL. Expanding learning opportunities for graduate students with HyFlex course design. *International Journal of Online Pedagogy and Course Design*. 2016;6(4):81-90.
3. Carmichael T, La Pierre Y. Interdisciplinary studies in the humanities. *The SAGE Handbook of Curriculum and Instruction*. 2014;312-329.
4. Martin AA, Polly D, Kidd T. Examining the relationship between interdisciplinary instruction and student engagement. *Journal of Interdisciplinary Studies in Education*. 2019;8(1):1-18.
5. Triyason T, Tassanaviboon A, Kanthamanon P. Hybrid classroom: Designing the new normal for education. *Education and Information Technologies*. 2022;27(1):1067-1090.
6. Beheshitha SS, Joksimović S, Dawson S, Gašević D. Examining the impact of HyFlex course design on student engagement and learning outcomes. *Computers and Education*. 2023;195:104726.
7. Dzuiban C, Moskal P, Kramer L, Thompson J. Student satisfaction with online learning in the presence of ambivalence: Looking for the will-o'-the-wisp. *The Internet and Higher Education*. 2012;17:1-8.
8. Vanslambrouck S, Zhu C, Pynoo B, Lombaerts K, Tondeur J, Scherer R. A latent profile analysis of adult students' online self-regulation in blended learning environments. *Computers in Human Behavior*. 2018;81:75-85.
9. Pierrakeas C, Georgopoulos N, Kameas A. Evaluating the effectiveness of a faculty development program for the adoption of the HyFlex teaching model. *Education and Information Technologies*. 2021;26(6):7475-7495.
10. Kim R, Olfman L, Ryan T, Eryilmaz E. Leveraging a personalized system to improve self-directed learning in online educational environments. *Computers and Education*. 2014;70:150-160.
11. Gnaur D, Svarre Kristensen K, Nyvang T. Facilitating group work in hybrid learning environments. *Australasian Journal of Educational Technology*. 2020;36(3):1-13.
12. So HJ, Brush TA. Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: Relationships and critical factors. *Computers and Education*. 2008;51(1):318-336.
13. Picciano AG. Blending with purpose: The multimodal model. *Journal of the Research Center for Educational Technology*. 2009;5(1):4-14.
14. Means B, Toyama Y, Murphy R, Bakia M, Jones K. Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies. US Department of Education; 2009s.
15. Paechter M, Maier B, Macher D. Students' expectations of, and experiences in E-learning: Their relation to learning achievements and course satisfaction. *Computers and Education*. 2010;54(1):222-229.
16. Owston R, York D, Murtha S. Student perceptions and achievement in a university blended learning strategic initiative. *The Internet and Higher Education*. 2011;18:38-46.
17. Cheong C, Bruno V, Cheong F. Designing a mobile-app-based collaborative learning system. *Journal of Information Technology Education: Innovations in Practice*. 2012;11(1):94-119.
18. Drysdale JS, Graham CR, Spring KJ, Halverson LR. An analysis of research trends in dissertations and theses studying

- blended learning. *The Internet and Higher Education*. 2013;17:90-100.
19. Bali M. MOOC pedagogy: Gleaning good practice from existing MOOCs. *MERLOT Journal of Online Learning and Teaching*. 2014;10(1):44-56.
  20. Vaughan ND. Student engagement and blended learning: Making the assessment connection. *Education Sciences*. 2014;4(4): 247-264.
  21. Johnson TE. Student perceptions of the flipped classroom. *The Journal of Effective Teaching*. 2015;15(1):20-27.
  22. Joksimović S, Gašević D, Loughin TM, Kovanović V, Hatala M. Learning at distance: Effects of interaction traces on academic achievement. *Computers and Education*. 2015;87:204-217.
  23. McGee P, Windes D, Torres M. Experienced online instructors: Beliefs and preferred supports regarding online teaching. *Journal of Computing in Higher Education*. 2017; 29(2):331-352.
  24. Kawasaki K, Yamaguchi E, Korenaga K. Promoting digital literacy through blended learning: A case study of an English language course in Japan. *International Journal of TESOL Studies*. 2021;3(2):22-38.
  25. Sumandiyar A, Laksana DNL, Ulfah M. Evaluating the effectiveness of a Hybrid learning model using the CIPP model. *International Journal of Instruction*. 2021; 14(2):711-728.
  26. Haningshah PC, Rohmi D. Blended synchronous learning: Challenges and opportunities in higher education. *Journal of University Teaching and Learning Practice*. 2022;19(3):1-16.
  27. Ozogul G, Karahan E, Marquez A, Reeves TD. Examining student perceptions and learning outcomes in a HyFlex course. *Computers and Education*. 2022;178: 104388.

---

© Copyright (2024): Author(s). The licensee is the journal publisher. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
<https://www.sdiarticle5.com/review-history/116887>