Flipped classroom approach of language education: a systematic review

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Article Info

ABSTRACT

The flipped classroom approach has emerged as an innovative pedagogical model in language education, transforming traditional teaching methods by reversing the conventional sequence of instruction and homework. The objectives of this systematic literature review are to examine the impact of various technological enhancements on the effectiveness and student engagement in flipped classrooms. Secondly, to explore the perceptions and attitudes of students and teachers towards flipped classroom methodologies across different educational contexts. Thirdly, to assess the effects of flipped classroom approaches on students' academic performance and critical thinking skills across various disciplines. This study conducted an extensive search of scholarly articles from reputable databases such as Scopus and Web of Science, focusing on studies published from 2021 until 2024. The flow of the study is based on the PRISMA framework. The database search identified 35 final primary studies that were analyzed. The findings were divided into three themes: i) technological enhancements in flipped classrooms, which were found to significantly improve student engagement and learning outcomes; ii) student and teacher perceptions of flipped classrooms, which were generally positive, with many highlighting increased interaction and autonomy in learning; and iii) outcomes and effectiveness of flipped classroom approaches, showing a positive impact on students' academic performance and critical thinking skills. In conclusion, the flipped classroom approach holds considerable promise for language education, offering a more effective and engaging alternative to traditional instruction. This review provides valuable insights for educators and policymakers seeking to adopt innovative teaching strategies in language education.

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1. INTRODUCTION

In recent years, the flipped classroom approach has gained significant attention in the field of education, particularly in language education. This innovative pedagogical method, which inverts the traditional teaching model by introducing new content outside of the classroom and using classroom time for interactive activities, promises to enhance student engagement and learning outcomes [1], [2]. The flipped classroom model allows students to study instructional materials, such as videos, readings, or presentations, at their own pace before attending class, thereby freeing up valuable classroom time for discussion, application, and deeper exploration of the subject [3]–[5]. The approach is particularly relevant in language education, where active participation, practice, and interaction are critical for mastering linguistic skills.

Despite its growing popularity, the effectiveness of the flipped classroom in language education remains a subject of debate, with some educators and researchers questioning its overall impact on student learning [6]–[10]. The increasing interest in the flipped classroom approach stems from its potential to address some of the inherent challenges in traditional language teaching. Conventional classroom settings often limit student-teacher interaction and provide insufficient opportunities for students to practice language skills actively [11]–[14]. In a traditional classroom, the teacher typically delivers content during class time, leaving students to practice language skills independently after class [15]–[17]. This model can be particularly limiting in language education, where active engagement and immediate feedback are crucial for developing proficiency. The flipped classroom model seeks to overcome these limitations by reversing the conventional sequence of instruction, thereby promoting more interactive and student-centered learning experiences.

While the flipped classroom approach has been widely adopted in various educational contexts, its implementation in language education presents unique challenges. Language learning is inherently complex, requiring students to develop a range of skills, including listening, speaking, reading, and writing [18]–[20]. The flipped classroom model, which relies heavily on students' ability to engage with instructional materials independently, may not be equally effective for all language learners, particularly those who struggle with self-regulation or who lack access to necessary technological resources [21]–[24]. Additionally, the success of the flipped classroom approach in language education depends heavily on the quality of the instructional materials provided and the design of in-class activities [25]–[27]. These factors raise important questions about the conditions under which the flipped classroom approach is most effective in language education. The existing literature on the flipped classroom approach in language education reveals a mixed picture, with studies reporting varying degrees of success. Some research suggests that the flipped classroom can lead to improved language proficiency, increased student motivation, and higher levels of engagement [28]–[30]. However, other studies highlight challenges such as students' resistance to the new model, the increased workload for both students and teachers, and the difficulty of ensuring that all students are adequately prepared for in-class activities [31]–[34]. These conflicting findings underscore the need for a more systematic examination of the flipped classroom approach in the context of language education, particularly in terms of its impact on different language skills and its applicability across diverse educational settings.

This systematic review aims to address the gaps in the existing literature by synthesizing research on the flipped classroom approach in language education. The primary objective is to examine the impact of various technological enhancements on the effectiveness and student engagement in flipped classrooms. Secondly, is to explore the perceptions and attitudes of students and teachers towards flipped classroom methodologies across different educational contexts. Finally, this systematic review is to assess the effects of flipped classroom approaches on students' academic performance and critical thinking skills across various disciplines. This review is important because it systematically examines the flipped classroom approach in language education, addressing gaps in the literature and providing insights into its effectiveness. The study's novelty lies in its focus on different language skills and practical strategies for successful implementation. The review will also explore the challenges associated with implementing the flipped classroom model in language education and propose potential strategies for overcoming these obstacles. By providing a comprehensive analysis of the current evidence, this review seeks to inform educators, policymakers, and researchers about the potential benefits and limitations of the flipped classroom approach in language education, ultimately contributing to the ongoing efforts to enhance the quality of language teaching and learning. Thus, the research questions of the study are as:

i) How do various technological enhancements impact the effectiveness and student engagement in flipped classrooms?
ii) What are the perceptions and attitudes of students and teachers towards flipped classroom methodologies across different educational contexts?
iii) What are the effects of flipped classroom approaches on students' academic performance and critical thinking skills across various disciplines?

2. METHOD

This section discusses the requirement for a methodical examination of the flipped classroom model in Malaysian language instruction. On the other hand, the approach taken to arrive at a solution for the research question posed by the present study is presented in the next section. There will be three sections to this review: i) technology improvements in flipped classrooms; ii) views of flipped classrooms from teachers and students; and iii) results and efficacy of flipped classroom strategies. Following that, this section systematically examines and combines scientific literature to identify, select, and assess noteworthy language education flipped classroom approaches. Finally, by considering prospective scholars, the final section discusses what should be done in response to the issues raised. This analysis utilizes the pre-recording

systematic reviews and meta-analysis (PRISMA) approach, which is a well-established standard for conducting a systematic literature review. Publication guidelines are necessary to assist writers in assessing and scrutinizing the thoroughness and precision of a review, including relevant and crucial information. The randomized study evaluation survey is a crucial aspect highlighted by PRISMA and should be taken into account when generating systematic analysis reports for different types of studies [35].

2.1. Identification

Several crucial steps from the systematic review process were used in this study to choose a sizable body of relevant literature. After selecting keywords, related terms were looked up using dictionaries, thesauri, encyclopedias, and prior research. After crafting search strings for the databases Scopus and Web of Science (WoS), all pertinent terms were found as shown in Table 1. A total of 609 publications pertinent to the research topic were successfully retrieved from these three databases during the first phase of the systematic review.

Table 1. The search string

Source	Search string
Scopus	TITLE-ABS-KEY ("Flipped Classroom" AND language AND education) AND (LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "ARTS")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2023) OR LIMIT-TO (PUBYEAR , 2024)) AND (LIMIT-TO (DOCTYPE , "ar")) Date of access: Jun 2024
WoS	"Flipped Classroom" AND language AND education (Topic) and 2021 or 2022 or 2023 or 2024 (Publication Years) and Article (Document Types) and Education Educational Research or Linguistics or Humanities Multidisciplinary or Social Sciences Interdisciplinary (Web of Science Categories) and English (Languages) Date of access: Jun 2024

2.2. Screening

During the screening step, the collection of potentially relevant research items is evaluated to see if they align with the predefined research questions. Content-related criteria commonly used in this phase include selecting research items related to the use of flipped classroom approach of language education: a systematic review. At this step, all duplicate papers are removed from the search results. In the first stage of screening, 478 publications were excluded, and in the second stage, 131 papers were examined based on various exclusion and inclusion criteria specific to this study as presented in Table 2. The primary criterion used was literature (research papers), as it is the main source of practical recommendations. This also included evaluations, comprehensive analyses, literary works, series of books, sections, and records of conferences that were not incorporated in the most recent investigation. Additionally, the review was limited to publications in English and focused only on the years 2021-2024. A total of 15 publications were rejected due to duplication.

Table 2. A filtered Scopus journal

Criterion	Inclusion	Exclusion
Language	English	Non-English
Time line	2021-2024	<2021
Literature type	Journal (Article)	Conference, book, review
Publication stage	Final	In Press
Subject	Social science and art humanities	Besides social science and art humanities

2.3. Eligibility

In the third phase, referred to as the eligibility assessment, a compilation of 116 articles was assembled. During this stage, a meticulous examination of the titles and core content of all the articles was conducted to confirm their alignment with the inclusion criteria and their relevance to the ongoing study's research objectives. Therefore, a total of 81 articles were excluded from the study because they did not meet the criteria. These criteria included being outside the relevant field, having a title that was not significant, having an abstract that was not related to the study's objective, and lacking full text access. As a result, a total of 35 articles remains for the upcoming review.

2.4. Data abstraction and analysis

An integrative analysis was employed as a means of evaluating and combining diverse research designs, specifically quantitative methods, in this study. The goal of the competent study was to identify

relevant topics and subtopics. The data collection stage marked the initial phase in the development of the theme. Figure 1 shows how the authors meticulously analyzed a compilation of 35 publications for assertions or material relevant to the topics of the current study. The authors then evaluated the current significant studies related to the flipped classroom. The methodology used in all studies, as well as the research results, are being investigated. Subsequently, the author engaged in a collaborative effort with other co-authors to develop themes derived from the evidence within the context of this study. A log was maintained during the data analysis process to document any analyses, perspectives, puzzles, or other thoughts pertinent to the data interpretation. Finally, the authors conducted a comparison of the results to identify any discrepancies in the process of designing the theme. It is worth noting that, if there are any disagreements between the concepts, the authors discuss them amongst themselves. The authors also conducted a comparative analysis of the findings to address any inconsistencies in the process of theme development. It is important to mention that if any discrepancies in the themes emerged, the authors resolved them through communication with each other. Finally, the developed themes were adjusted to guarantee their consistency. In order to ensure the accuracy of the assessments, the examinations were conducted by two specialists, with one having expertise in language and technology education. The expert review phase ensured the clarity, significance, and sufficiency of each sub-theme by proving domain validity. Modifications have been made by the author in response to feedback and comments from experts, using their own judgement. The flowchart diagram can be seen in Figure 1.
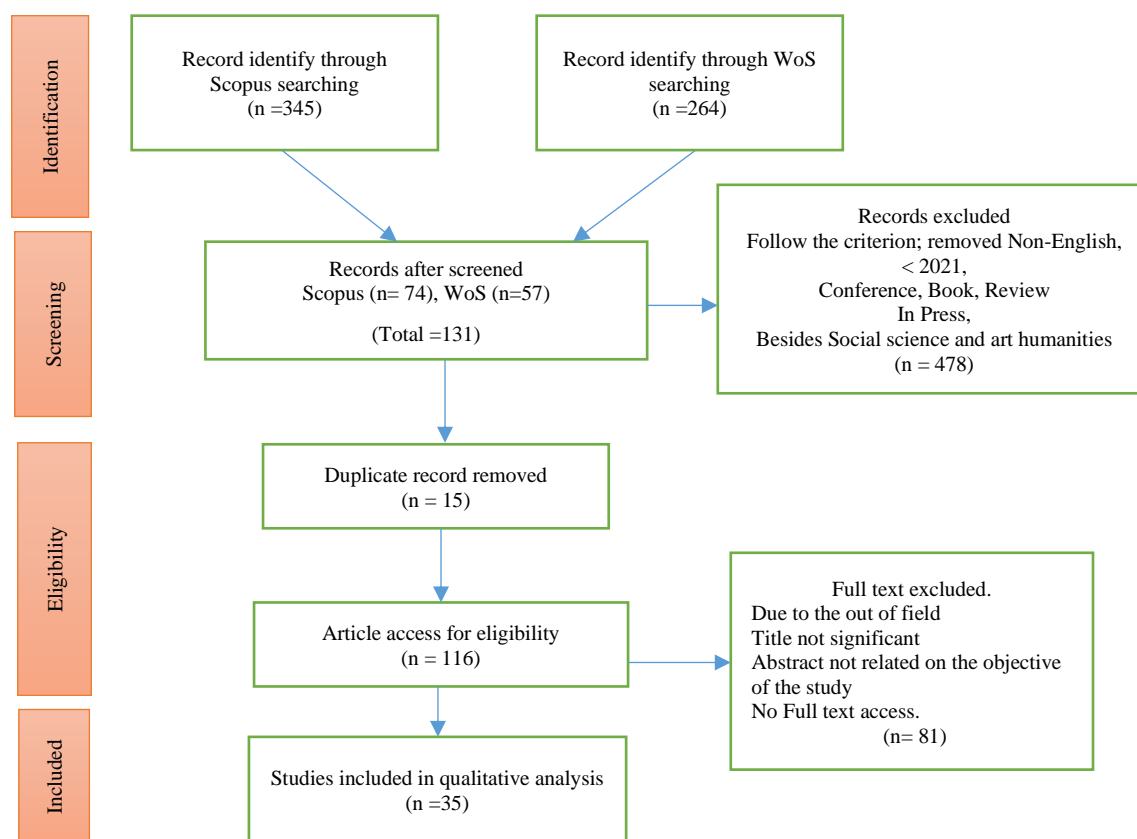

Figure 1. Flow diagram of the proposed searching study [35]

3.   RESULTS AND DISCUSSION

A flipped classroom is an effective method of language teaching. A successful teaching method can ensure that students master language learning effectively. The searching technique led to the extraction and analysis of 35 articles. All articles were categorized based on three main themes: technological enhancements in flipped classrooms (10 articles), student and teacher perceptions of flipped classrooms (11 articles), and further outcomes and effectiveness of flipped classroom approaches (14 articles). The results can be seen in Table 3. The results provide a comprehensive analysis of flipped classroom approaches in language education.

Table 3. The research article finding based on the proposed searching criteria

No	Study	Title
Theme 1: technological enhancements in flipped classrooms		
1	[36]	Assessing the effectiveness and student perceptions of synchronous online flipped learning supported by a metaverse-based platform in medical English education: A mixed-methods study
2	[37]	Exploring the viability of augmented reality game- enhanced education in WhatsApp flipped and blended classes versus the face-to-face classes
3	[38]	How to creatively flip to online learning environments: a showcase of design and tools for an award-winning, online language teaching project
4	[39]	Exploring teacher immediacy-(non)dependency in the tutored augmented reality game-assisted flipped classrooms of English for medical purposes comprehension among the Asian students
5	[40]	ChatGPT, a partnering tool to improve ESL learners' speaking skills: case study in a public university, Malaysia
6	[41]	The effect of the virtual flipped classroom on the academic writing: self-perception of university students
7	[42]	Application of a network teaching platform in English classroom teaching
8	[43]	A MOOC-based flipped classroom model: reflecting on pre-service English language teachers' experience and perceptions
9	[44]	The efficiency of tailored systems for language education: an app based on scientific evidence and for student-centered approach
10	[45]	Flipped classroom: motivational affordances of spherical video-based immersive virtual reality in support of pre-lecture individual learning in pre-service teacher education
Theme 2: student and teacher perceptions of flipped classrooms		
1	[46]	Insiders' perceptions of the flipped classroom approach in Chinese EFL junior secondary schools
2	[47]	What do Malaysian ESL teachers think about flipped classroom?
3	[48]	Seeing innovation from different prisms: university students' and instructors' perspectives on flipping the Spanish language classroom
4	[49]	Students' perceptions of the flipped classroom approach in tertiary EFL education: a case study from Banja Luka
5	[50]	Undergraduate international students' challenges in a flipped classroom environment: an Australian perspective
6	[51]	EFL students' perceptions of online flipped classrooms during the COVID-19 pandemic and beyond
7	[52]	Prospective primary school EFL teachers' beliefs about "flipping"
8	[53]	The flipped classroom in the context of digitization of educational space: a students' perspective
9	[54]	Flipped classroom pedagogy in higher education in EFL contexts: findings and implications for further research
10	[55]	A conceptual review on EFL teachers' motivation and engagement in flipped classrooms: a social networking platform
11	[56]	Flipped learning in education: a content analysis
Theme 3: outcomes and effectiveness of flipped classroom approaches		
1	[57]	Implementing flipped classroom model in developing basic language arts of the fourth grade students
2	[58]	Impact of flipped classroom on EFL learners' self-regulated learning and higher-order thinking skills during the COVID19 pandemic
3	[59]	Developing an ESP-based language learning environment to help students improve critical thinking skills in written output
4	[60]	Improving students' higher order thinking skills and achievement using WeChat based flipped classroom in higher education
5	[61]	Towards the pivotal factors for the influence of flipped classroom on students' self-regulated learning and EFL speaking competence
6	[8]	Assessment of a flipped classroom: an innovative method of teaching English for EFL undergraduate students in Thailand
7	[62]	Flipped classroom and critical thinking on public speaking class
8	[63]	Task based approach: an approach to develop writing skills in English of engineering students leads to effective communication skills
9	[64]	Effects of flipped language classrooms on learning outcomes in higher education: a Bayesian meta-analysis
10	[65]	Assessing the effects of flipped classroom to the primary pupils' English learning performance
11	[66]	The flipped classroom: improving critical thinking for critical reading of EFL learners in higher education
12	[67]	Programming language training with the flipped classroom model
13	[68]	E-learning and flipped classroom in inclusive education: the case of students with the psychopathology of language and cognition
14	[69]	A review study of activities used in the development of intercultural communication competence in foreign language classes

3.1. Theme 1: technological enhancements in flipped classrooms

The integration of advanced technological tools in flipped classroom environments has shown significant promise for enhancing educational outcomes. Notably, a study by İbili et al. [36] explores the use of a Metaverse-based platform to support synchronous online flipped learning in a medical English course. Further, students in the experimental group who engaged with the metaverse platform outperformed those in the control group in terms of academic achievement. The study underscores the potential of metaverse environments to foster permanent learning, facilitate deep understanding, and make abstract concepts more tangible through interactive three-dimensional (3D) objects. Despite some technical challenges, the students expressed that this approach increased their engagement and interest in the subject matter [36]. Similarly, Khodabandeh [37] investigated the viability of augmented reality games (ARG) in flipped and blended language learning contexts. The study involved elementary English as a foreign language (EFL) students who used ARG-enhanced education to learn directional language skills. Both the flipped and blended groups

significantly outperformed the control group, highlighting the efficacy of ARGs in creating immersive, student-centered learning environments. This approach not only improved learning outcomes but also demonstrated the flexibility of integrating digital tools in both online and traditional classroom settings [37].

Further extending the use of immersive technologies. Jong [45] examined the motivational affordances of spherical video-based immersive virtual reality (SV-IVR) in flipped classrooms for pre-service teacher education. Grounded in the attention, relevance, confidence, satisfaction model (ARCS), the study found that SV-IVR effectively captured students' attention and enhanced relevance and satisfaction but did not significantly boost confidence. This suggests that while SV-IVR can make pre-lecture learning tasks more engaging, additional support might be needed to ensure students feel confident in their learning [45]. Another study by Muniandy and Selvanathan [40] introduced ChatGPT as a partnering tool in flipped English as a second language (ESL) classrooms to improve speaking skills. This innovative use of artificial intelligence (AI) in education provided instant feedback and created an engaging learning environment, significantly enhancing students' speaking abilities. The mixed-method research indicated that learners faced some challenges but generally found the use of ChatGPT beneficial for language practice [40].

Researchers have also extensively explored the application of massive online open courses (MOOCs) in flipped classrooms. Yaşar and Polat [43] implemented a MOOC-based flipped classroom model in an English language teaching (ELT) program for pre-service teachers. Their findings showed significant improvements in academic achievement and positive perceptions among participants, suggesting that MOOCs can effectively supplement traditional teaching methods and enhance learning experiences [43]. Zhang [42] explored the use of MOOC platforms in English classroom teaching, finding that such platforms optimize learning processes and improve teaching effectiveness. The study compared traditional teaching methods with a MOOC-based flipped classroom model and concluded that the latter significantly improved students' attitudes, interests, and collaborative strategies in learning English [42].

Chura-Quispe *et al.* [41] evaluated the effectiveness of virtual flipped classrooms in enhancing academic writing skills. The study's quasi-experimental design demonstrated significant improvements in the experimental group's writing skills, highlighting the potential of flipped classrooms to enhance academic competencies through targeted, student-centered approaches [41]. Guo [38] showcased a design for online language teaching that utilized multimodal tools to create an effective flipped classroom environment. By leveraging technology-mediated, task-based language teaching, the study highlighted the benefits of using captioned videos and other digital tools to facilitate meaningful communication and learning in virtual settings, particularly during the pandemic [38]. Finally, Figueiredo [44] discussed the use of a tailored mobile app to support second language learning among immigrants and refugees. The app, designed based on scientific evidence, incorporated a flipped classroom approach to reinforce educational goals and provide a student-centered learning experience. This approach was particularly beneficial in reducing anxiety and enhancing motivation among learners in challenging educational scenarios [44].

In conclusion, technological enhancements in flipped classrooms, ranging from Metaverse platforms and ARG to MOOCs and AI tools like ChatGPT, have demonstrated substantial benefits in various educational contexts. These innovations not only improve academic achievement but also enhance student engagement, motivation, and overall learning experiences. However, continuous research and refinement are essential to address challenges and optimize these technologies for diverse learning environments. The findings of these studies underscore the need for educational practice and policy to embrace and support the integration of advanced technological tools in flipped classrooms, ensuring that educators are equipped with the necessary resources and training to effectively implement these innovations. This alignment will help maximize the potential of flipped classrooms to transform learning experiences and outcomes in a rapidly evolving educational landscape.

3.2. Theme 2: student and teacher perceptions of flipped classrooms

The integration of flipped classrooms into various educational settings has generated considerable interest and mixed perceptions among students and teachers. In Chinese junior secondary schools, research by Ye [46] indicated that both students and teachers recognize the potential benefits of flipped classrooms in enhancing academic performance and engagement. However, they also noted challenges such as the need for better ICT infrastructure and professional development for teachers to maximize the approach's effectiveness. Similarly, Malaysian ESL teachers in a study by Kiang and Yunus [47] expressed positive views about flipped classrooms, emphasizing their ability to foster active and collaborative learning. Nonetheless, concerns about the availability of technology and internet connectivity in rural areas highlighted significant barriers to implementation.

At the tertiary level, García-Allén and Taylor [48] explored perceptions of flipped classrooms in Spanish language courses. Their findings suggest that both students and instructors appreciated the increased engagement and autonomy provided by the flipped model, though they faced initial adjustment challenges.

Josifović-Elezović [49] further corroborated these positive perceptions in a case study involving EFL students in Banja Luka, where flipped classrooms significantly enhanced student motivation, engagement, and satisfaction. However, students expressed reluctance towards a complete replacement of traditional lectures, indicating a preference for a blended approach that incorporates both traditional and flipped elements. International contexts reveal additional complexities, particularly for non-native students. Singh and Hiran [70] investigated the challenges faced by undergraduate international students in Australian universities adopting flipped classrooms. Language barriers, difficulties with autonomous learning, and technological issues were prominent concerns. Hung [51] similarly noted that EFL students in Vietnam had positive perceptions of online flipped classrooms during the COVID-19 pandemic but also encountered typical challenges related to technology and self-directed learning. These studies collectively emphasize the necessity for tailored support systems to address the unique needs of diverse student populations.

In terms of teacher perspectives, Wang [71] highlighted the role of teacher motivation and engagement in the successful implementation of flipped classrooms. The integration of social networking platforms can enhance these aspects by providing new communication and interaction opportunities. Fernandez-Carballo [52] echoed these sentiments, finding that prospective primary school EFL teachers in Spain valued the flipped classroom model for its ability to foster critical 21st-century skills such as communication, collaboration, creativity, and critical thinking. The evolving landscape of flipped classrooms underscores the need for continuous research and adaptation. Hoque et al. [54] identified a growing body of evidence supporting the benefits of flipped classrooms in EFL contexts, though they called for more studies to address the specific challenges and opportunities within this pedagogical approach. Research by Gromoglasova et al. [53] reinforced the importance of leveraging digital tools to enhance the flipped classroom experience, particularly in developing essential skills for the modern educational environment.

In conclusion, flipped classrooms have demonstrated considerable potential for enhancing educational outcomes across different contexts. Despite the positive perceptions of both students and teachers, challenges related to technology access, student autonomy, and the need for professional development persist. Addressing these issues through targeted support and infrastructure improvements will be crucial to optimizing the effectiveness of flipped classrooms. Incorporating these findings into educational practice and policy will ensure that necessary resources and training are provided to support both students and teachers in navigating the flipped classroom model, ultimately contributing to more effective and equitable learning experiences across diverse educational settings.

3.3. Theme 3: outcomes and effectiveness of flipped classroom approaches

The implementation of flipped classroom models (FCM) has demonstrated substantial benefits in enhancing various aspects of language learning, as evidenced by multiple studies. Kaya [57] found that utilizing FCM in fourth-grade Turkish language lessons significantly developed students' basic language skills. The action research, conducted over nine weeks, revealed positive outcomes not only in language skills but also in cognitive, affective, psychomotor, and social competencies. Moreover, improvements in classroom management and reductions in behavioral issues were noted. Positive feedback from students, teachers, and parents further underscored the effectiveness of FCM in fostering a supportive learning environment. In the context of EFL learning, Samadi et al. [58] highlighted the significant impact of FCM on self-regulated learning strategies and higher-order thinking skills. The study involved EFL learners from two private language institutes in Iran, demonstrating that FCM promotes cognitive and meta-cognitive competence. The findings indicated that FCM enhances students' abilities to evaluate, analyze, and create, thus fostering self-directed learning. Similarly, Zhong [61] emphasized the pivotal factors contributing to FCM's influence on students' self-regulated learning and EFL speaking competence, identifying both student-related factors (learning style, interest, and confidence) and classroom-related factors (design, content, and instruction quality) as crucial elements.

In higher education, the integration of FCM with modern technologies has been shown to be effective in improving academic performance and critical thinking skills. Liu and Zhang [60] conducted a quasi-experimental study comparing traditional instruction with a WeChat-based FCM in an information technology course. The results indicated that the FCM significantly enhanced student achievements and higher-order thinking skills, such as critical thinking and problem-solving. This study provides empirical evidence supporting the use of social software to enhance educational outcomes. Additionally, Yulian [66] explored the enhancement of critical reading and thinking skills in EFL learners through FCM, showing significant improvements in accuracy, clarity, precision, depth, relevance, and logic, thus promoting self-directed learning. Extensive research has demonstrated the effectiveness of FCM in developing specific language skills. Parati et al. [65] assessed the impact of FCM on primary pupils' English learning performance in Malaysia, finding moderate positive correlations with improvements in listening, speaking, reading, and writing skills. This study highlighted the value of FCM in providing an alternative approach to enhance second language education. Similarly, Hassan et al. [59] integrated FCM with the synergy model

and brain-based learning to create an English for specific purposes (ESP) environment, aiding in the development of critical thinking skills and academic success among students.

Overall, the integration of FCM in language learning environments across various educational levels and contexts has been shown to enhance language skills, critical thinking, and self-regulated learning. The evidence from these studies supports the adoption of FCM as a viable instructional strategy to improve educational outcomes and foster a more interactive and student-centered learning experience. Given these findings, it is essential to consider the implications for educational practice and policy. Schools and educational institutions may need to invest in the necessary infrastructure, technology, and professional development to support the effective implementation of FCM. Additionally, educational policies could be adapted to encourage the integration of flipped classroom models, ensuring that teachers and students are equipped with the tools and resources needed to maximize the benefits of this innovative approach.

4. CONCLUSION

The integration of advanced technological tools in flipped classroom environments, such as Metaverse platforms, ARG, MOOCs, and AI tools like ChatGPT, has significantly enhanced educational outcomes by improving academic achievement, engagement, and motivation across various contexts. These technologies have demonstrated effectiveness in fostering deeper understanding, self-regulated learning, and critical thinking, particularly in language learning. This systematic review, which examines the impact of technological enhancements on the effectiveness and student engagement in flipped classrooms, has shown that from junior secondary schools to higher education, flipped classrooms have the potential to boost student motivation, develop essential skills, and create interactive, student-centered learning experiences. Despite these positive impacts, challenges such as inadequate infrastructure, technological barriers, and the need for ongoing support persist, underscoring the necessity for continuous research and development to optimize the effectiveness of flipped classroom models in diverse educational contexts.

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