BIC Journal of Management

BOSTON INTERNATIONAL COLLEGE

Review Article, PP. 66-80

A Review of Teachers' Awareness and Perceptions of Integrating the Flipped Classroom Model into Higher Education

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Article History

Submitted: April 15, 2025
Reviewed: May 10, 2025
Revised: May 25, 2025
Accepted: June 14, 2025

Cite

Dawadi, M. P., Panta, P. & Shukla, A. K. (2025). A review of teachers' awareness and perceptions of integrating the flipped classroom model into higher education. BIC Journal of Management, 2(1), 66-80.

ABSTRACT

The landscape of higher education is undergoing a significant transition in recent years as traditional, teacher-centered pedagogies give way to more student-centered teaching and learning strategies. Among the emerging pedagogical models, the flipped classroom model (FCM) has drawn considerable attention from the stakeholders for its potential to enhance student engagement and improve learning outcomes. This review paper examined fifty-five empirical studies published in high-ranked journals (Q1, Q2, Q3) between 2011 and 2025, focusing on the integration of FCM into regular teaching-learning practices in higher education. It explored the key factors associated with teachers' awareness of the FCM, their perceptions of its effectiveness, and obstacles to its effective adoption. Additionally, it identified ways to overcome these barriers and effectively implement the model. The findings of the study revealed that while an increased awareness of the flipped class approach has been observed, teachers' levels of preparedness and confidence in its implementation continue to remain low. While its ability to accommodate interactive and student-centered learning remains widely recognized, challenges such as time, technological, and resource limitations persist. These obstacles can be addressed through targeted training, institutional support, professional development opportunities, and a shared institutional vision.

Keywords: blended learning, digital pedagogy, flipped classroom model, innovative teaching, self-directed learning, technology integration

Introduction

Pedagogy and education systems constantly evolve and adapt to new methodologies. In recent years, the concept of classroom teaching and learning has undergone a noticeable transformation, reflecting the shift from conventional, instructor-focused teaching practices to modern, student-centered pedagogy (Afzal et al., 2023). The traditional approach to teaching was only focused on providing bookish knowledge to students (Wang, 2022). Students did not have any active roles inside the classroom, as they were only required to listen to their professors, in return for which they were expected to achieve good exam results. Over time, traditional lectures have become outdated as they fail to address

the need for a modern learning environment (Mortensen & Nicholson, 2015). With the significant development of science and technology, its integration with teaching methodologies has helped in the transition of practices and pedagogies towards a more student-centered learning environment. Contemporary innovative teaching practices facilitate students' motivation, efficiency, and productivity (Anjass et al., 2025). They pay more attention to active learning, student autonomy, and engagement in the learning process (Kerimbayev et al., 2023). Among contemporary teaching models, the FCM has drawn considerable attention to its potential to enhance student engagement and improve learning outcomes by providing flexibility and freedom in the learning process (Biag & Yadegaridehkordi, 2022).

FCM is a modern technique of teaching that focuses on technology integration to replace traditional lectures (Sheerah, 2022). This new concept helps students learn foundational concepts out of the classroom setting and use these learnings inside the classroom practically to enhance the learning outcomes (Long et al., 2017). The practice of flipped methods motivates students to actively engage in the learning process, which also allows them to learn at their own pace (Afzal et al., 2023). In this approach, classroom sessions are redesigned to focus on more interactive and student-centered learning activities like group discussions, team building, joint problem solving and applied practices. While the traditional approach is centered on the teachers who give lectures in the classroom and assigning homework, FCM can be thought of as the opposite of the conventional approach because it emphasizes lectures outside the classroom setting and self-directed learning (Abeysekera & Dawson, 2015). Agirman and Ercoşkun (2022) elucidate the flipped classroom model as a technique of learning the simple theories and concepts of a subject during extracurricular time through the utilization of educational technology, while carrying out complex learning activities inside the classroom. The key objective of the flipped approach is to offer unlimited learning opportunities to the learners, ensuring equal participation of students inside the classroom and sharpening their critical thinking ability. This emerging concept seeks to switch the role of a professor, where they can spend very little time explaining concepts and utilize more time to practically engage students in the learning process that boosts student productivity (Flores et al., 2016). Such a shift in pedagogy is believed to foster a more stimulating classroom atmosphere where students can better understand the concepts through real-world practices and meaningful interactions.

FCM is the progression of former distant learning platforms, such as open online courses (Antonova et al., 2016). It has achieved considerable attention over the years with the rapid growth of e-learning platforms, such as Khan Academy, offering students a myriad of activities, recorded video clips and student-centric personalised dashboards which enable students to learn what they desire at their own pace (Zengin, 2017). In South Africa, the use of flipped classroom models generated positive and pleasant experiences for students (Cilliers & Pylman, 2020). FCM consumes more of the students' after-school time for reading and learning concepts; however, they ask for a similar approach in the future. Similarly, research conducted in Spain provides more evidence regarding the effectiveness of flipped models. The perception of students was found positive towards the integration of interactive tools like Kahoot in the learning process, which has proved beneficial for boosting their productivity (Ruiz, 2021). Another study was conducted in Jordan to investigate teachers' perceptions of flipped classroom models. This study reflects the positive attitude of teachers toward flipped learning models (Abuhmaid, 2020). The increasing momentum of the flipped approach has made a significant impact on the Asian higher education system as well. The post-pandemic research conducted in Pakistan concluded that most students are in favor of FCM, as it enhances engagement, performance, and learning (Mujtaba Asad, 2022). Similarly, the work of Ha et al. (2019) recommends that most teachers and learners are positive towards the outcomes of the flipped approach. Enough evidence is found regarding the positive outcomes of flipped models that have energized instructors across the globe to adopt this approach for deriving interactive and student-centered learning outcomes.

FCM is becoming popular in the global arena. However, its integration into the Nepalese higher education system is still in its infancy. While implementing such interactive and tech-intensive models in countries like Nepal, many obstacles in the form of incompetencies in technological resources, insufficient teacher training, and, to some extent, resistance to change from conventional methods appear on the way. In this regard, Acharya (2024) states that the concept of tech-integrated learning is gaining popularity in HEIs of Nepal. However, its proper implementation is still lacking, and the practical essence of this model is still underexplored. Institutional culture, teacher awareness of blended learning methods,

and technological hindrances are some constraining factors affecting its implementation in the Nepalese education system (Shah, 2020).

The pedagogical and structural limitations obstruct its effective implementation. The unfamiliarity of this novel approach and deeply rooted conventional teaching models create more difficulties in establishing a flexible learning environment (Garcia-Ponce & Mora-Pablo, 2020). Moreover, multiple factors like a lack of technological resources and internet facilities, insufficient pedagogical skills of tutors, and resistance to tech-adoption have piled up more challenges for adopting this novel approach in countries like Nepal (Neupane, 2021). Acharya (2024) further discloses that students mostly encounter difficulties with self-directed learning, as they require additional guidance to understand the concept effectively on their own. These problems create the room for further research to understand the viewpoint of teachers, the challenges they face in implementing FCM, and suggest possible solutions.

The works of Bhagat et al. (2016), Flores et al. (2016), Rottellar and Cain (2016), Awidi and Paynter (2019), Al-Samarraie et al. (2020), and Palazón-Herrera and Soria-Vílchez (2021) have sought to explore the effectiveness of FCM in HEIs, focusing on students' experiences in this model. However, limited research has focused on the teacher's awareness and perception, which are significant in understanding its effectiveness, practical implementation, and drawbacks of this model. Moreover, limited scholarly research has been conducted about flipped classroom models in the context of Nepal. Because FCM has grabbed substantial attention in recent times, it has become necessary to investigate teachers' perceptions, which will help to explore the crux of this pedagogical shift and improve learning outcomes.

This paper is based on a thematic review of fifty peer-reviewed research articles that explore the existing status, challenges, and attempts made by the stakeholders to overcome the challenges to the effective implementation of FCM. The researchers have reviewed empirical studies related to FCM from reliable academic databases, such as Google Scholar and Scopus. The research papers were published in high-impact journals (categorized as Q1, Q2, and Q3) between 2011 and 2025.

Evidence on Teachers' Awareness and Perceptions of Integrating the Flipped Model Classroom

This study uncovers five key facets of integrating FCM into higher education classrooms. It explores the prior studies in FCM concerning the degree of practitioners' acquaintance with FCM and its implications. Furthermore, the study unfolds how the HEI's teachers perceive it, sheds light on their attitudes, expectations, and experiences. Additionally, it highlights the perceived barriers and offers meaningful ways to overcome them to ensure more effective integration.

Conceptualizing the Flipped Classroom Model

The FCM embodies a meaningful break from the conventional lecture-based pedagogy to learner-centred teaching-learning activities. As a reversal of the conventional pedagogical approach, FCM introduces digital learning materials, such as recordings, reading texts, video lectures, and presentations in advance for their prior reading and preparation. This practice can also be considered as a part of digital pedagogy (DP), which focuses on the planned use of technology in the teaching-learning process. DP is the skillful integration of digital tools and technologies into teaching to enhance learning, instruction, assessment, and curriculum delivery (Väätäjä et al. 2021). In FCM, classroom activities focus more on learner-centred activities like problem solving, peer-learning, and application-based learning (Bergmann & Sams, 2012; Sohrabi & Iraj, 2016). This shift facilitates questioning, discussion, and critical thinking with an interactive learning environment. In this regard, Long et al. (2017) state that the use of FCM enables learners to be exposed to the core content of the lesson prior to the class. This supports them to be engaged more intensely in the classroom activities, which in turn enhances their critical thinking. Here, the teacher's role shifts from being the primary source of information to that of facilitator. Afzal et al. (2023) claim that FCM disrupts conventional pedagogical norms by transferring content acquisition responsibility to learners. This alteration ensures a greater degree of autonomy and supports self-directed learning. It correlates with the expectation of present higher education for creating student-centered learning environments as it facilitates self-regulation and clear comprehension.

Agirman and Ercoskun (2022) present the historical evolution of FCM, connecting it with Bloom's Taxonomy. They point out that FCM purposely moves lower-order thinking tasks like content absorption to the pre-class phase so that the class time will be used for higher-order thinking activities, such as analysis, evaluation and creation. Technology integration is the key to the successful integration of FCM.

In this regard, Hamdan et al. (2013) assert that Flipped Learning Instruction (FLI), an extension of FCM, utilizes the advancement of technology to ensure that the learning becomes more personalized, flexible, and accessible. Digital platforms, such as Khan Academy, have contributed to this paradigm shift, offering students easy access to learning resources and personalized support.

The FCM redefines the teacher's role in the classroom, shifting from banking knowledge to facilitating learners through exploration and guided inquiry (Flores et al., 2016). Ozdamli and Asiksoy (2016) highlight that FCM encourages learners' active participation and activity-oriented learning to enrich the quality of classroom engagement. In a similar vein, Awidi and Paynter (2019) claim that FCM enables students to show a high degree of self-assurance, intrinsic motivation, and active participation in the learning process. Its personalized and interactive nature supports learners to grasp information autonomously and get involved in meaningful classroom interactions.

In a nutshell, FCM is characterized by role reversal in instruction and the deliberate use of technology to enhance learning. This indicates a significant break from the conventional pedagogy. To free up class time for active and application-based learning that enables higher levels of student autonomy and cognitive engagement, students are exposed to new learning materials outside the classroom, often in digital format. This shift not only reframes the teacher's role as a content provider to one of a learning facilitator, but it also fosters a more dynamic and engaged learning environment that helps students develop higher-order thinking abilities. Researchers consistently emphasize that FCM is a pedagogical innovation based on student-centered learning rather than merely a means of delivering content. Enhanced classroom engagement, better academic achievement, and higher student motivation are among the benefits that have been reported. But as the model becomes more well-liked, there is a significant research need in terms of a scant examination of teachers' perspectives and experiences.

Table 1

Flipped Classroom Model in Higher Education

Author and Year	Research Title	Key Findings
Long et al. (2017)	The Flipped Classroom Instructional Model in Higher Education	The use of FCM enables learners to be exposed to the core content of the lesson before the class
Flores et al. (2016)	FCM at University: Professors' and Students' Assessments	FCM redefines the teacher's role of focusing on boosting student productivity.
Ozdamli and Asiksoy (2016)	Flipped Classroom Approach	FCM enhances classroom interaction through student engagement and activity-based learning.
Long et al. (2017)	Use of the Flipped Classroom Instructional Model in Higher Education	FCM enables pre-class foundational learning, promoting active and critical thinking during class.
Awidi and Paynter (2019)	Impact of FCM on Student Learning Experience	FCM increases student confidence, motivation, and active participation.
Agirman and Ercoskun (2022)	History and Uses of the Flipped Classroom Model	FCM shifts lower-order tasks to pre-class, reserving class time for higher-order thinking.
Afzal et al. (2023)	Teachers' Perception on Integrating Flipped Classroom	FCM disrupts conventional pedagogical norms by transferring

Models in Higher Education Courses	content acquisition responsibility to learners.

Teachers' Awareness of the Flipped Classroom Model

With the advent of new teaching methodologies, teachers must become more knowledgeable and conscious, which calls for a shift in their pedagogical perspective and technological flexibility. Teachers' awareness, in this context, requires an understanding of the transition from a traditional teacher-centered instructional model to a student-focused pedagogy. Teachers' familiarity with this model is crucial for its successful implementation (García-Ponce & Mora-Pablo, 2020).

García-Ponce and Mora-Pablo (2020) assert that teachers must be aware not only of the design and delivery of instructions but also of the roles they are expected to play as FCM relies heavily on classroom learner-centred interactions through academic content such as podcasts, online articles, video materials, and other digital modules. Technological awareness is another component that has to be understood by teachers for successful implementation. In a flipped classroom, the teacher's job is not to provide information, but rather to act as a facilitator who enables the students to create their knowledge (Yeboah et al., 2020).

Divergent findings of contradiction were noted in different studies regarding the teachers' awareness of the flipped classroom approach. The research conducted by Eniola et al. (2020) indicated that teachers had high awareness regarding flipped classroom techniques and readily accepted the use of the flipped learning strategy. On the contrary, Okonkwo and Ndur's (2023) research reveals that with teachers, the percentage of awareness on the utilization of the flipped approach was very low and they also found it very difficult to adopt this practice since they did not have access to technology, there was a weak internet connection and they were not exposed to computers. These research studies indicate that the availability and accessibility of technology play a critical role in informing the teacher of flipped methods. For instance, teachers in a country like Nepal, where technological uptake is less immediate, would not be aware of what flipped as a concept entails, what the benefits, limitations, and future aspects of this revolutionary pedagogy are. The lack of awareness of the flipped classroom models, particularly on technology tools required to deliver the content outside the classroom setting, is placing barriers to the implementation of this new approach (Antonova et al., 2016). The awareness of FCM is projected to be improved through effective training and workshops (Okonkwo & Ndur, 2023).

A study carried out by Hao and Lee (2016) focused on investigating the anxiety of pre-service teachers towards flipped models and found that self-concerns influenced their awareness and beliefs towards the models. Pre-service teachers on the threshold of starting their teaching career struggled with issues related to self-efficacy and very little pedagogical knowledge. It shows that the lack of experience in the teaching field also lowers the awareness of FCM among teachers. In the same study, fluctuations in awareness levels were identified based on various demographic dimensions. For instance, senior teachers showed relatively higher levels of awareness, proving that experience influences teachers' awareness of the flipped approach. Furthermore, gender-based differences were also observed, where female teachers showed higher levels of awareness in implementing the model efficiently.

The growing optimism and interest in flipped models are evident throughout the world. Many teachers are highly aware and perceive the flipped classroom approach positively (Rotellar & Cain, 2016). On the other hand, teachers' awareness should also take into account the readiness and capacity of students to engage in this novel approach. A study by Ma et al. (2024) presented the viewpoint of Junior high school teachers, suggesting that students often face difficulties with time management due to the academic workload of multiple subjects, which leads to stress and various health issues. Hence, teachers must also understand the student's perspective to be fully aware of this approach.

The literature reviewed above presents a complex picture of teachers' awareness regarding the flipped approach. While there is growing popularity and awareness of flipped models around the globe, many teachers remain hesitant due to self-doubt, technological concerns, and uncertainty of students' positive responses. A basic understanding of theoretical concepts is not enough for the successful implementation of FLP. It requires self-confidence, resources, and training to use those resources efficiently. For this, educational institutions need to invest in both technological training and pedagogical innovation. Raising teachers' awareness is not merely about introducing a new instructional approach. It also involves changing mindsets, building confidence, and continuous learning.

Table 2

Flipped Classroom: Awareness, Adoption, and Challenges

Author and Year	Research Title	Key Findings
Hao and Kathryn (2016)	Teaching in Flipped Classrooms: Exploring Pre-service Teachers' Concerns	Pre-service teachers often face challenges with self-efficacy and limited pedagogical knowledge when implementing Formative Classroom Management (FCM).
Antonova et al. (2016)	FCM as Innovative Practice in Higher Education: Awareness and Attitude	Teachers' lack of awareness and technological familiarity is a major barrier to the integration of FCM.
Rotellar and Cain (2016)	Implementing the Flipped Classroom: Research, Perspectives, and Recommendations	Teachers show a high degree of awareness and positive perceptions of FCM.
García-Ponce and Mora-Pablo (2020)	Challenges of using a blended learning approach	Teachers must be aware not only of the design and delivery of instructions but also of the roles they are expected to play
Eniola et al. (2020)	Awareness and Acceptance of Flipped Learning in Oyo State Secondary Schools	Teachers demonstrate strong awareness and readiness to accept FCM with minimal obstacles.
Okonkwo and Ndur (2023)	Awareness and Adoption of FCM by Student Teachers in Asaba, Nigeria	Training programs and workshops play a significant role in enhancing awareness and integration of FCM.
Ma et al. (2024)	Full-Flipped Classroom Model: Junior High English Teachers' Perspective	Students struggle with time management and experience stress due to the workload in multiple subjects.

Teachers' Perceptions of the Flipped Classroom Model

The FCM, designed to create more engaging and interactive learning experiences, is gaining attention from teachers across diverse academic contexts. This pedagogical shift is a result of teachers' general belief that FCM offers a more interesting substitute for conventional lecture-based instruction, which tends to limit students' active engagement. For instance, Afzal et al. (2023) discovered that teachers in Lahore viewed the flipped model favorably overall, especially because of its capacity to promote deeper learning and raise student engagement. These findings align with global trends, where teachers are realizing more and more that providing content outside of the classroom frees up in-class time for group projects, more in-depth discussions, and one-on-one help.

Teachers usually experience a sense of accomplishment when they see their students grow into responsible and engaged learners. According to Al-Samarraie et al. (2020), flipped classrooms support students' academic accomplishment as well as their metacognitive awareness and positive attitude toward learning. The transition from passive to active learning is a major component in teachers' preference for this model. A study conducted by Hamdan et al. (2013) revealed that teachers who had implemented FCM reported increased personal satisfaction in their teaching careers, in addition to improved student performance. They found the experience more enjoyable because they were able to engage more with the students during class.

Abuhmaid (2020) also noted that teachers in Jordanian schools believed that flipped learning greatly improved student learning outcomes and changed the role of the teacher. Teachers saw themselves shifting from lecturing in front of the class to a more guiding or facilitative role, helping students learn in more engaging and individualized ways. It's interesting to note that female teachers expressed greater opinions about the value of the flipped model, indicating that the model is also sensitive to particular teaching philosophies and values within teacher cohorts.

Positive feedback from students also has a significant impact on teacher attitudes. In a study conducted in South Africa, Cilliers and Pylman (2020) discovered that while students had to put in more effort and required more technical support, they generally enjoyed the flipped classroom model and were ready to enroll in similar courses in the future. Teachers feel more confident and motivated when they know that students appreciate their teaching methods. In their study of early childhood education students, Palazón-Herrera and Soria-Vílchez (2021) also found that academic performance improved under the FCM, which teachers probably interpret as a reflection of their hard work.

In the studies, teachers have pointed out the issues underlying the application of the flipped classroom model. According to Ma et al. (2024), teachers, particularly those in junior high school, face difficulties managing the demands of classroom activities, pre-session preparation, communication, and grading. The majority of the teachers reported a greater workload. and having little time for their personal lives and families. These pressures not only cause burnout but also discourage the teachers from implementing the model's long-term sustainability.

Highlighting another equally significant issue in the Nepalese context, Acharya (2024) states that the transition hasn't always been smooth, although teachers are becoming greatly interested in flipped classrooms. Students in flipped classrooms frequently find it difficult to learn on their own and need extra help to stay up. In the absence of extensive institutional support, teachers are compelled to offer more assistance than they otherwise might, which can be extremely exhausting. Acharya points out that there is a conflict between creativity and conformity when the flipped approach deviates from the overall goals of the national curriculum. In these circumstances, teachers may experience conflict between the need to address pressing educational needs and the need to test out new, promising approaches.

The findings of the literature reflect a clear picture of teachers' perspectives on the FCM. Its potential to improve student-centered, interactive, and successful learning is well known. Most teachers are excited about the change in classroom dynamics and enjoy having more one-on-one interactions with students. Even so, commonplace problems like growing workloads, student preparedness, and curriculum standards alignment continue to be major obstacles. For the flipped classroom to be successful, teachers need more than just enthusiasm. In their schools or school systems, they require professional development, institutional support, and a common goal.

Table 3

Flipped Classroom Implementation: Global and Nepalese Perspectives

Author and Year	Research Title	Key Findings
Hamdan et al. (2013)	Review of Fli pped Learning	FCM improves student outcomes and increases teacher satisfaction.
Abuhmaid (2020)	Teachers' Perceptions of FCM in Jordanian Schools	Teachers transition from lecturers to facilitators, offering more personalized support.
Al-Samarraie et al. (2020)	FCM in Higher Education: A Review Across Disciplines	FCM supports academic performance, metacognition, and positive attitudes toward learning.

Contd.

Author and Year	Research Title	Key Findings
Cilliers and Pylman (2020)	South African Students' Perceptions of FCM	Despite technical challenges, students favor FCM and are open to future adoption.
Palazón-Herrera and Soria-Vílchez (2021)	FCM in Early Childhood Education Degree	FCM leads to improved academic performance.
Afzal et al. (2023)	Teachers' Perception of Integrating FCM in Higher Education	Teachers view FCM positively as a means of enhancing engagement and promoting deeper learning.
Acharya (2024)	Pedagogical Paradigms and Technological Integration in Nepal	Students struggle with self-directed learning; instructors face high demands in maintaining student pace.
Ma et al. (2024)	FCM in Junior High English Teaching	Teachers report stress and burnout due to a lack of personal time under full FCM.

Challenges in Implementing the Flipped Classroom Model

The FCM has garnered significant attention in education systems worldwide, considering its potential to enhance learning experiences through a student-centered approach. Despite its various pedagogical supremacy, its practical implementation is affected by a wide range of challenges. The major challenges appear in the form of technological, pedagogical, and socio-cultural factors that obstruct give-and-take relations between teachers and students in a flipped model.

Several studies have examined the challenges associated with this approach. The study of Al- Al-Samarraie et al. (2020) states that the key challenge faced by instructors when adopting FCM is the length of time required to prepare and deliver interactive materials. It is a time-consuming task for instructors to find and prepare relatable course content for students. The flipped classroom has reportedly improved students' performance (Akçayır & Akçayır, 2018). However, its implementation initially requires a significant amount of time for preparing videos and other resources (Antonova et al., 2016). As per the teachers, there is long term stress which leads them to burnout, job quitting intention, anxiety, and depression symptoms (Ma et al., 2024). A lot of work in little time means a lack of sleep. On top of that, there is no time for exercise. Likewise, family time and interaction with friends decrease too. According to these findings, teachers may find the time taken to prepare and produce quality materials a burden, rendering them negatively disposed toward FCM.

Hindrance to implementing flipped learning methodologies is due to technological aspects among other things. Due to a lack of sufficient knowledge about computer and information technology among teachers, it has become a bottleneck for application and implementation of FCM (Li, 2018). In a country like Nepal where technology development is rather slow, both teachers and students do not have access to proper digital educational resources and constant internet connectivity. As Akçayır and Akçayır (2018) noted, students' preparedness for class may be inadequate due to a lack of work on the materials outside of class. This may be due to lower access to technology and materials.

Some other challenges to the flipped classroom approach are resistance from society, parental pressure, and lack of student readiness. In Jordan, the role of parents and their awareness were the main aspects that obstruct the introduction of this approach in schools (Abuhmaid, 2020).

From the student's point of view, the flipped approach creates a greater burden, as most of their spare time is spent completing assignments for multiple subjects, causing them mental stress (Ma et al., 2024). Such difficulties lead to poor academic performance, which further triggers the non-acceptance of this approach by society, parents, and students alike. While such resistance occurs, teachers often feel isolated and unsupported during their transition to fit into flipped models (Toivola, 2016).

While there exist numerous strengths of flipped classroom models, they still suffer from various challenges. Literature reveals that time constraints, technological literacy, resource availability, motivational problems, and parent, learner, and societal resistance all impact the effectiveness of FCM. Schools must put their highest priority on ensuring proper support to teachers, plan resource expenditure on training and technology, and foster public acceptance of this new practice of teaching to counteract such issues. Overcoming the many disadvantages and challenges faced by both students and instructors is as vital to the success of FCM as awareness of its potential and benefits.

Table 4

Challenges in Implementing the Flipped Classroom Model

Author and Year	Research Title	Key Findings
Toivola (2016)	Why Teachers Flip and What Are Their Worries?	Teachers feel isolated due to resistance from students, parents, and society during the shift to FCM.
Antonova et al. (2016)	FCM as Innovative Practice in Higher Education	Preparing videos and resources need high initial time investment.
Akçayır and Akçayır (2018)	The Flipped Classroom: Advantages and Challenges	Students' poor preparation for pre-class activities is a significant challenge.
Al-Samarraie et al. (2020)	A Flipped Classroom Model in Higher Education: A Review Across Disciplines	The extensive time required to prepare interactive materials is a major challenge.
Abuhmaid (2020)	Teachers' Perceptions on the Impact of Flipped Learning in Jordanian Schools	A barrier to FCM implementation is parents' lack of awareness and involvement.
Ma et al., (2024)	A Full-flipped Classroom Mode from the Perspective of Junior High School English Teachers	There is long term stress which leads teachers to burnout, job quitting intention, anxiety, and depression symptoms

Strategies to Overcome the Challenges

The FCM is gaining popularity as an instructional approach, which increases student motivation, active learning, and understanding of course material. But there are downsides to the flipped classroom, as there is any educational model. New research provides an actionable way to solve these problems that allows educators to design more effective learning environments. Equal access to technology for all students is often the biggest challenge a flipped teacher may confront.

Barrios et al. (2022) argue that for flipped learning to succeed, students need the right tools to engage with material outside of class. In areas where technological access is limited, students should have devices or offline learning resources. This is crucial to prevent the digital divide from becoming a problem. Similarly, Rotellar and Cain (2016) suggest that instructional designers are key in deciding what material should be provided outside of class and what can be taught during class. This approach optimizes learner participation and engagement. When resources and technology are distributed more evenly, students have opportunities to succeed in classrooms.

Holding students accountable for their learning is another issue that frequently arises. According to Wong and Looi (2011), teachers can help students take charge of their education by creating lesson plans that motivate them to learn in unconventional, after-school environments. Students should also use what they have learned in class to solve problems in the real world. Learning becomes relevant and meaningful when it is put into practice. Teachers can motivate students by setting clear expectations and giving right assessments. Lin (2022) also points out that to overcome the barriers to flipped classrooms, strong teacher-student relationships and effective curriculum planning are crucial. An open learning environment makes students stay focused and take responsibility for their work.

Another important factor in solving the issues in the flipped classroom is teachers' professional development. According to Hao and Lee (2016), pre-service teachers need to have the knowledge, skills and competencies to teach in a flipped classroom. This can be achieved by addressing the needs of future teachers and offering them appropriate training in technology and teaching methodology. Teacher preparation programs must address the needs of teachers and provide them with the essential tools. Antonova et al. (2016) advocate the need for workshops and seminars led by experienced practitioners of the flipped classroom for the professional development of teachers. With consistent investment in teachers' professional development, schools and colleges enable teachers to be well-prepared to meet the demands of flipped learning.

Flipped classrooms are ideal for enhancing skills, fostering teamwork, and improving comprehension of subject matter (Barrios et al., 2022). Unlike conventional assessment, teachers can use peer evaluation, group projects, and self-evaluation as tools to measure their learning outcomes. These evaluation methods allow students to show their learning in ways that better reflect the skills they gain through flipped learning, unlike memorization or simple recall. In the similar vein, Silverajah et al. (2022) argue that phased implementation of FCM allows students and teachers to adapt to this approach gradually without much pressure. Regular student feedback and response can help teachers adjust their teaching techniques and make changes to better meet student needs. Furthermore, it creates a less stressful and more adaptive learning environment for both teachers and learners (Lin, 2022).

Despite its noticeable educational benefits, adopting the flipped classroom model as an effective pedagogical approach requires overcoming several contextual barriers. The literature reveals the ways to ensure everyone has equal access to technology, promote student accountability, and provide educators with sufficient opportunities for professional growth. A phased implementation plan, combined with the use of various assessment methods, is a key way to facilitate the transition to this pedagogical approach. The success of the flipped classroom model depends on the cooperation of educators, students, and institutions to advance the learning process.

Table 5

Pedagogical Supports and Implementation Strategies for Flipped Classroom Model

Author and Year	Research Title	Key Findings
Wong and Looi (2011)	Seamless Learning via Mobile Assistance: A Critical Review	Teachers can foster responsibility by encouraging learning in out-of-school, non-traditional environments.
Yungwei et al. (2016)	Teaching in Flipped Classrooms: Exploring Pre-Service Teachers' Concerns	Pre-service teachers require support in pedagogy and technology to enhance their confidence and proficiency in FCM.
Lin (2022)	Flipped Classroom Based on Bloom's Taxonomy	Ongoing feedback supports stress reduction and better adaptation to FCM for both students and teachers.

Contd.

Author and Year	Research Title	Key Findings
Rotellar and Cain (2016)	Perspectives on Implementing the Flipped Classroom	Instructional designers play a crucial role in determining pre-class and in-class content to maximize engagement.
Silverajah et al. (2022)	Review of Self-Regulated Learning in Flipped Classrooms	Phased implementation helps both learners and educators transition into FCM without stress or confusion.
Barrios et al. (2022)	Flipped Classroom and Educational Resilience During COVID-19	Access to proper tools and infrastructure is essential for effective out-of-class learning in FCM.

Conclusion

This review draws considerable attention to FCM's potential to transform traditional teacher-centered pedagogy into modern learner-centered andragogy. Studies reveal that while awareness of FCM is increasing, disparities in teachers' confidence and preparedness persist. Although many teachers perceive it as pedagogically beneficial, several barriers prevent the practical application of the tool, including time constraints, low technological skills, a lack of suitable resources, student resistance, and societal perceptions. We require a shared pedagogical vision, ongoing professional development, institutional support, and comprehensive training to address these challenges. Phased implementation, a variety of assessment techniques, and mechanisms to increase teacher and student accountability are all essential for fostering the meaningful and sustainable integration of FCM. While much research has focused on school students' experiences with flipped classrooms, a noticeable lack of empirical work exists in examining teachers' perceptions, especially in Nepal, where the flipped model is still a relatively novel concept. This gap is significant because teachers are central to any meaningful shift in pedagogical practice. If the pedagogical shift is to be long-lasting and significant, it is necessary to gain a deeper understanding of their beliefs, concerns, and willingness to innovate teaching pedagogy. Hence, future researchers can delve deeper into the lived experiences of college teachers, exploring not only what they know about FCM but also how they feel about it, what they need to implement it effectively, and how local contexts shape their choices and challenges.

Author Contributions: For this study, Min Prasad Dawadi conceptualized and designed the study, specified the framework, and conducted the review of the key literature. Prabhas Panta prepared the literature matrix, drafted the introduction, and the remaining section of the literature review. Ajay Kumar Shukla, PhD supervised and reviewed the overall contents of the paper. All authors contributed to refining the manuscript based on the peer- reviewer's feedback and finalizing the paper.

Funding: The authors received no financial support or grants for this research and publication.

Data Availability Statement: The data supporting the findings of this review are available in the cited literature.

Acknowledgements: The authors would like to express their sincere gratitude to Niranjan Devkota, PhD, for his invaluable guidance and mentorship in shaping this review paper into its present form.

Conflicts of Interest: The authors declare that this publication involves no conflict of interest.

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