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ORIGINAL ARTICLE

A Comprehensive Analysis of the Dimensions, Components, and Indicators Influencing Flipped Learning: A Meta-Synthesis Approach

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ABSTRACT

The present study aims to identify the factors that constitute flipped learning and examines the key dimensions of this educational approach. This research is applied in terms of purpose and qualitative in terms of data type and was conducted using the meta-synthesis method. The study population includes all documents, theoretical foundations, and background related to flipped learning in domestic (2000-2024) databases. Purposeful non-random sampling was carried out and the sample size was determined based on systematic elimination according to the Prism model flow chart. Data collection tools included record-keeping and systematic literature review, and a 27-item checklist based on the Prism model was used to calculate validity and Cohen's kappa coefficient was used to calculate reliability. Data analysis was performed with MaxQDA2018 software and thematic analysis method. The findings show that flipped learning includes the dimensions of transferring content outside the classroom, focusing on active learning, and providing feedback and clarification. These dimensions are reciprocally related to components such as podcasts, educational videos, and problem-based learning, interaction, and continuous and immediate assessments, and help increase student engagement and participation. The results of this study emphasize the positive impact of flipped learning on the quality of learning and academic achievement of students, and it is suggested that future research examine the practical effects of these dimensions and the challenges of implementing them in classrooms.

KEYWORDS

Flipped Learning, Flipped Classroom, Problem-Based Learning.

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Introduction

The rapid advancement of digital technologies and the growing demand for learner-centered education have transformed traditional approaches to teaching and learning. In conventional classrooms, instructional time is largely devoted to the transmission of knowledge, while students are expected to complete assignments and practice independently outside the classroom. Although this model has long been the dominant form of education, its limitations in promoting active participation, collaboration, self-directed learning, and higher-order thinking have encouraged educators and researchers to explore alternative approaches. One such approach is flipped learning, which reconfigures the traditional relationship between classroom instruction and out-of-class learning activities.

Flipped learning moves the initial exposure to instructional content beyond the classroom, typically through digital resources such as recorded lectures, educational videos, podcasts, presentations, and other online materials. Classroom time can then be devoted to activities that require students to apply, discuss, analyze, and extend what they have learned. Rather than spending most of the class period delivering information, instructors assume a more facilitative role by guiding students through collaborative activities, problem solving, discussion, and formative assessment. This restructuring of instructional time creates greater opportunities for meaningful interaction between teachers and students and among students themselves.

Importantly, flipped learning is not synonymous with simply assigning students videos to watch before class. It is a broader pedagogical model that integrates pre-class preparation, active classroom learning, interaction, assessment, and timely feedback. Its effectiveness therefore depends on the alignment of technological resources with appropriate instructional strategies and learner engagement. High-quality pre-class materials may provide students with greater flexibility and control over the pace of their learning, while well-designed classroom activities can promote deeper understanding through application and collaboration. Continuous feedback, in turn, enables students to identify misconceptions and improve their performance.

Despite the growing body of research on flipped learning, the literature remains conceptually diverse and fragmented. Previous studies have examined different aspects of the approach, including the use of educational videos, student engagement, active learning, problem-based learning, interaction, assessment, academic achievement, and learning satisfaction. However, these elements are often investigated separately, making it difficult to determine how they fit together within an integrated framework. A systematic synthesis of the existing literature is therefore needed to identify the core dimensions of flipped learning and to clarify the components and indicators associated with each dimension.

Against this background, the present study seeks to develop a comprehensive understanding of flipped learning by synthesizing findings from domestic and international research. Specifically, it aims to identify the principal dimensions, components, and indicators that characterize flipped learning and to examine the relationships among them. By integrating findings across previous studies, the research seeks to provide a coherent conceptual foundation that can inform educational practice, curriculum design, teacher preparation, and future empirical research.

Method

This applied study adopted a qualitative research design and used meta-synthesis as its methodological approach. Meta-synthesis was selected because it enables researchers to systematically integrate findings from multiple qualitative and conceptual studies and move beyond a descriptive review toward a more comprehensive conceptual understanding of a phenomenon.

The research population comprised published studies, theoretical works, and relevant scholarly documents addressing flipped learning. Domestic literature published between 1390 and 1403 in the Iranian calendar and international literature published between 2000 and 2024 were considered. Relevant studies were identified through a systematic search of domestic and international databases. A purposive, non-probability sampling strategy was used to select studies that met the predefined inclusion criteria. The final body of literature was established through a systematic screening and elimination process based on the stages outlined in the PRISMA framework.

Data were collected through a systematic literature review and structured documentation of the selected studies. A 27-item checklist developed in accordance with the PRISMA framework was used to assess the methodological and reporting characteristics of the identified studies and to strengthen the transparency and validity of the selection process. The extracted information included concepts, dimensions, components, indicators, and relevant findings related to flipped learning.

The selected studies were analyzed using thematic analysis. MAXQDA 2018 was used to organize the literature, conduct the coding process, identify recurring concepts, and establish relationships among codes and categories. The analysis began with the identification of meaningful statements and concepts related to flipped learning. Similar concepts were subsequently grouped into initial categories, which were then compared, refined, and integrated into broader components and dimensions. This iterative process continued until the main conceptual patterns underlying the literature were identified.

To assess the reliability of the coding process, Cohen's kappa coefficient was used to examine the level of agreement between coding decisions. The validity of the review process was supported through systematic adherence to the PRISMA-based selection criteria and the use of the structured 27-item checklist. These procedures enhanced the methodological rigor, transparency, and consistency of the meta-synthesis.

Results

The synthesis of the selected literature revealed that flipped learning can be organized into three overarching dimensions: moving content delivery outside the classroom, promoting active learning during class, and providing continuous feedback and clarification. These dimensions are closely interconnected and collectively represent the core instructional process of flipped learning.

The first dimension, moving content delivery outside the classroom, refers to providing students with access to instructional materials before they attend the classroom session. This dimension includes educational videos, podcasts, recorded lectures, digital learning materials, and other multimedia resources. By encountering core instructional content before class, students can learn at their own pace, revisit difficult concepts, and arrive in class with a basic understanding of the subject matter. This preparation creates the foundation for using classroom time more effectively.

The second dimension, promoting active learning, represents the central pedagogical feature of the flipped approach. Instead of devoting most classroom time to information delivery, instructors engage students in activities that require them to use and extend their prior knowledge. The identified components include problem-based learning, collaborative learning, classroom interaction, discussion, inquiry, practical activities, and problem solving. Among these, problem-based learning is particularly important because it allows students to connect theoretical knowledge with authentic problems and develop higher-order cognitive skills. Increased interaction and collaboration also provide opportunities for students to exchange perspectives, articulate their reasoning, and learn from their peers.

The third dimension, providing continuous feedback and clarification, emphasizes the importance of monitoring student learning throughout the instructional process. The relevant components include continuous assessment, immediate assessment, formative evaluation, teacher feedback, clarification of misconceptions, and opportunities for students to ask questions. This dimension highlights the changing role of the instructor in a flipped classroom. Rather than functioning primarily as a transmitter of information, the instructor becomes a facilitator who monitors learning, identifies difficulties, provides guidance, and supports students in developing a deeper understanding of the subject matter.

The findings further indicate that these three dimensions are mutually reinforcing. Pre-class exposure to instructional content prepares students for active participation during class; active learning provides opportunities to apply and deepen that knowledge; and continuous feedback helps students recognize and correct misunderstandings. The integration of these processes can consequently strengthen student engagement, participation, interaction, autonomy, and the overall quality of learning.

Discussion and conclusion

The findings of this meta-synthesis suggest that flipped learning should be understood as a comprehensive pedagogical model rather than simply a technology-supported alternative to conventional instruction. The three dimensions identified in this study represent complementary stages of an integrated learning process. Moving content delivery outside the classroom creates additional time for meaningful classroom interaction, active learning transforms that time into opportunities for application and collaboration, and continuous feedback ensures that students receive the support necessary to consolidate and improve their learning.

These findings also help clarify an important conceptual issue in the flipped learning literature. Although educational technologies such as videos and podcasts are frequently presented as defining features of flipped classrooms, technology alone does not constitute flipped learning. Digital resources are valuable because they facilitate pre-class preparation, but their educational impact depends on how effectively they are integrated with classroom activities. Similarly, active learning strategies are most effective when students have adequate opportunities to prepare beforehand and receive appropriate guidance and feedback during and after classroom activities.

From an instructional perspective, successful implementation of flipped learning requires careful alignment among content, pedagogy, technology, assessment, and learner needs. Teachers need to develop concise and accessible pre-class materials, design classroom activities that encourage students to apply and discuss what they have learned, and use formative assessment to identify learning difficulties. Students, meanwhile, need to assume greater responsibility for preparing before class and actively participating during classroom activities. Thus, the flipped approach involves a shift not only in instructional structure but also in the roles and responsibilities of both teachers and learners.

The synthesis also indicates that the potential benefits of flipped learning extend beyond academic performance. By increasing opportunities for interaction, collaboration, problem solving, and individualized feedback, flipped learning can foster student engagement and active participation. These characteristics may contribute to deeper learning and improved academic achievement. Nevertheless, the successful implementation of the approach cannot be taken for granted. Factors such as unequal access to digital resources, limited technological skills, inadequate instructional design, insufficient student preparation, resistance to changes in established learning practices, and difficulties in producing high-quality digital content may constrain its effectiveness.

Future research should therefore examine the empirical relationships among the three dimensions identified in this study and investigate whether their relative importance varies across educational levels, academic disciplines, learner characteristics, and institutional contexts. Further research should also explore the practical challenges associated with implementing flipped learning and identify strategies for addressing technological, pedagogical, and organizational barriers.

In conclusion, this meta-synthesis identifies three interconnected dimensions at the core of flipped learning: content delivery outside the classroom, active learning inside the classroom, and continuous feedback and clarification. Educational videos, podcasts, problem-based learning, interaction, and ongoing assessment function as important components within this framework. The findings suggest that the effectiveness of flipped learning depends on the integration of these elements rather than on the use of any single instructional technology or strategy. When appropriately designed and implemented, flipped learning can create a more active, interactive, flexible, and learner-centered educational environment, with the potential to enhance student engagement, participation, learning quality, and academic achievement.

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Authors' Contribution

All authors were involved in data collection, analysis, writing, and final approval of the manuscript.

Conflict of Interest

The author declares no conflict of interest regarding the publication of this article.

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