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The Dynamics of Students' Self-Efficacy in Flipped Classroom-Based Mathematics Instruction

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ABSTRACT

This study examines the dynamics of students' self-efficacy in flipped classroom-based mathematics instruction and its contribution to improving learning engagement and confidence. The background of this research is rooted in the persistent problem of low student participation, anxiety, and negative perceptions toward mathematics learning, which often affect academic achievement. Therefore, the study aims to explore how the flipped classroom model supports the development of students' self-efficacy in mathematics learning. This research employed a qualitative literature review approach by analyzing relevant scientific articles related to flipped classrooms, self-efficacy, and mathematics education. Data were collected through documentation techniques and analyzed using thematic analysis to identify patterns regarding the formation and development of self-efficacy. The findings reveal that flipped classroom learning provides meaningful learning experiences through independent study, collaborative discussions, and problem-solving activities. Students become more confident because they are given opportunities to understand the material before classroom interaction and actively participate during learning sessions. Furthermore, the flipped classroom enhances learning independence, critical thinking skills, and emotional readiness while reducing mathematics anxiety. However, the effectiveness of this model is influenced by student readiness, teacher facilitation, and technological support. In conclusion, the flipped classroom is an effective and innovative learning model that can significantly strengthen students' self-efficacy and improve the quality of mathematics learning in the digital education era.

INTRODUCTION

Education is one of the main pillars in the development of quality and competitive human resources in the global era. The rapid development of science and technology requires the world of education to not only focus on mastering the material, but also on the development of high-level thinking skills, problem-solving skills, and the formation of students' character and affective aspects. Human resources with quality that are able to compete at the global level are formed on a strong and quality educational foundation. Science and technology will continue to develop and must be accompanied by mastery of materials, strengthening high-level thinking skills, problem-solving skills, and the formation of character and affective aspects of students in the education system created. In this case, mathematics plays a crucial role because it is a basic science that is the foundation for various other fields of science, as well as functioning to train logical, systematic, critical, and analytical thinking skills (Husna et al., 2025). Thus, this designed mathematics learning not only focuses on producing students

who understand concepts theoretically, but also the application of the system in the real life of students with confidence in the utilization of mathematical abilities in various situations.

However, the conditions in the field show that mathematics learning is still faced with various challenges that are quite complex. Many students have created a negative stigma against math concepts, such as finding them difficult, abstract, and scary. This perception affects the low participation of students in each learning process and ends in the achievement of student learning outcomes less than optimally. Previous research has also revealed that students' mathematical abilities in Indonesia, particularly in terms of problem-solving and concept comprehension, are still below international standards(Kurniawan & Mashuri, 2021). In addition, students often have difficulty conveying mathematical ideas, are less active in discussion activities, and have a low level of confidence when facing problems or problems. This shows that problems in mathematics learning are not only related to cognitive aspects, but also include affective aspects that play an important role in determining student learning success.

One of the affective factors that has a great influence on mathematics learning is self-efficacy. This concept is an important part of educational psychology that reflects the importance of individual confidence in the ability to organize and carry out rational actions to achieve certain goals(Bandura, 1995 in Husna et al., 2025). In math learning, self-efficacy serves as a determining factor that influences the way students think, act, and face academic challenges. Students who have high self-efficacy generally show stronger motivation, better perseverance in the face of difficulties, and more active participation in the learning process. In contrast, students with low self-efficacy tend to avoid tasks that are considered difficult, give up more quickly, and experience higher levels of anxiety when learning math. Therefore, self-efficacy is an important factor that not only impacts learning outcomes, but also affects the entire learning process.

Conceptually, this research is based on Social Cognitive Theory developed by Albert Bandura as the main basis. This theory explains that the form of behavior created by an individual is the result of a dynamic interaction between personal factors (cognitive and affective), the environment, and the behavior itself, known as reciprocal determinism. Within this framework, self-efficacy is one of the key constructs that affect individual learning behavior. Bandura stated that self-efficacy is formed through four main sources, namely mastery experience, vicarious experience, verbal persuasion, and physiological and emotional states. These four sources have strong relevance in the success of math learning systems, especially learning models that should require active student involvement and meaningful learning experiences.

In addition, self-efficacy also has important dimensions that show its dynamic nature, namely level, strength, and generality. This dimension shows that students' self-confidence is not fixed, but can develop or decrease depending on the learning experience experienced. Therefore, self-efficacy is not only seen as the end result of the learning process, but also as a process that continues to evolve along with the student's interaction with the learning environment.

In learning, one of the external factors that also affects the formation of self-efficacy is the learning model applied. Conventional teacher-centered learning models tend to limit students' active engagement, providing fewer opportunities for them to have meaningful learning experiences. This condition has implications for the low level of confidence of students in learning mathematics. Therefore, maximum innovation is needed in the implementation of learning models so that an effective, active and collaborative learning atmosphere can be created in supporting the optimization of students' potential development.

One of the many learning models that have been developed and are considered to have the potential to meet the needs of students is the flipped classroom model. This model changes

the traditional learning pattern because students need to learn and understand the material early independently by utilizing digital media, then the time in the classroom is utilized for more interactive activities such as discussion, collaboration, and problem-solving(Damayanti & Afriansyah, 2024). The application of this model provides opportunities for students to manage their own learning process, so that it can encourage independence, increase active participation, and strengthen confidence in understanding the learning material.

In Bandura's theoretical perspective, flipped classrooms have great potential in supporting the formation of self-efficacy through various mechanisms. Self-study activities before class can provide a mastery experience, group discussions allow for a vicarious experience, interaction with teachers and peers provides verbal persuasion, and a more flexible learning atmosphere can help manage students' emotional states (physiological states). The flipped classroom model not only plays a role in improving cognitive learning outcomes, but also in building students' self-confidence gradually.

The results of previous research show that flipped classroom has a positive influence because it is able to improve critical thinking skills and students' ability to learn independently as an achievement of learning aspects, as well as improve problem-solving skills (Widiantika (Putri et al., 2025)et al., 2025). In addition, some studies have also shown that flipped classrooms can improve students' self-efficacy in math learning(Husna et al., 2025)Stephanus, 2025). Nonetheless, most of these studies use a quantitative approach that focuses on measuring learning outcomes or comparing scores between groups.

The quantitative approach has not been able to fully describe how the process of forming and developing student self-efficacy during learning takes place. In fact, self-efficacy is a dynamic construct and is influenced by learning experiences, social interactions, and individual reflection. Therefore, a qualitative approach is needed because it has the ability to delve into learning experiences and the dynamics of changes in self-efficacy in student learning.

Based on this description, there is a research gap, namely there are still limited studies that explore in depth the dynamics of student self-efficacy in flipped classroom-based mathematics learning, especially with a qualitative approach. In addition, research that examines the relationship between students' learning experiences and sources of self-efficacy, according to Bandura in the context of flipped classrooms, is also still relatively limited.

Thus, this study has a uniqueness in examining self-efficacy not only as a result variable, but as a dynamic and contextual process in mathematics learning. This research focuses on exploring student experiences, changes in self-confidence, and factors that affect the dynamics of self-efficacy in flipped classroom-based learning. Through a qualitative approach, this research is expected to be able to provide a deeper, comprehensive, and contextual understanding of how student self-efficacy is formed and developed in the mathematics learning process.

METHODS

This study applied a qualitative approach with the type of case study because it aims to examine in depth the dynamics of student *self-efficacy in* flipped classroom-based *mathematics learning* through the interpretation of various findings reported in scientific articles. Qualitative research is based on an interpretive paradigm that emphasizes the understanding of meaning and process, and is carried out in natural conditions with the researcher as the main instrument(Abdussamad, 2021). In addition, this approach is also used to study phenomena holistically and comprehensively, so that it is able to explain the process of the occurrence of a symptom, not only focusing on the final result(Murdiyanto, 2020).

The type of research used is a case study based on a literature review, where the researcher analyzes various results of previous research that are relevant to understand the same phenomenon. Case studies in qualitative research are used to explore a phenomenon in depth within certain constraints as well as by using a variety of data sources (Creswell, 2013).

The data source in this study is in the form of scientific articles that discuss flipped classroom, self-efficacy, and mathematics learning. The selection of data sources is carried out purposively, namely based on certain criteria that are in line with the research objectives. In qualitative research, purposive sampling techniques are used to determine the data sources that are considered to be the most capable of providing in-depth and relevant information (Scott, 2016). Therefore, the articles used are works that are directly related to the research focus and have academic quality that can be accounted for.

The data collection technique in this study is carried out through literacy and documentation studies, namely by collecting, reading, and systematically studying various documents in the form of scientific articles. This technique allows researchers to obtain data that is textual and in-depth(Given, 2008). The data collected included theoretical concepts, research results, and descriptions of the implementation of flipped classroom and its effect on student self-efficacy.

The data analysis in this study was carried out using qualitative analysis techniques through a thematic analysis approach. The analysis process takes place interactively and continuously until a deep understanding is achieved. The stages of analysis include data reduction, data presentation, and conclusion drawing as stated by Miles et al. (2014). Data reduction was carried out through selection to focus data relevant to the dynamics of student self-efficacy. Furthermore, the data is compiled and presented in the form of a structured descriptive narrative. The last stage is the drawing of conclusions which is carried out through the interpretation of the relationship between findings from various sources.

The analysis process in qualitative research is inductive, where the researcher develops an understanding based on data found in the field or in documents, not based on predetermined hypotheses (Yin, 2016). With this approach, researchers can uncover the dynamics of self-efficacy as a process that develops through students' learning experiences in flipped classrooms.

To maintain the validity of the data, this study uses the source triangulation technique, which is by comparing various findings from different articles. Triangulation is one of the techniques to increase the credibility of qualitative research by combining various data sources or methods (Abdussamad, 2021). In addition, consistency checks were also carried out between findings to ensure that the research results had a high level of confidence.

RESULTS AND DISCUSSION

Findings of Previous Research on Self-Efficacy and Flipped Classroom

The results of analysis from various previous studies show that self-efficacy is one of the psychological factors that is very decisive in the success of mathematics learning. Self-efficacy is not only related to students' belief in their abilities, but also affects how students think, feel, and act in the face of various learning tasks. In mathematics learning that is often considered difficult and complex, self-efficacy is a distinguishing factor between students who are able to survive in the face of difficulties and students who tend to give up or even avoid the academic challenges given. Thus, (Fitriani & Pujiastuti, 2021)self-efficacy not only serves as a supporting factor, but also as a major determinant in the mathematics learning process.

The findings of the study show that low student self-efficacy has direct implications for low motivation and engagement in learning. Students with low levels of self-efficacy tend to show a passive attitude, lack confidence in expressing opinions, and have a tendency to avoid tasks that are considered difficult. In addition, they are also more prone to experiencing anxiety

when faced with challenging math problems. This condition is in line with research that states that many students have a negative perception of mathematics due to a lack of confidence in their own abilities. This shows that problems in mathematics learning are not only cognitive, but also greatly influenced by affective aspects that play an important role in determining student learning success(Husna et al., 2025)

On the other hand, students who have high self-efficacy show more positive characteristics, such as high levels of confidence, perseverance in learning, and the ability to manage learning strategies effectively. They tend to be more actively involved in learning, dare to try various ways to solve problems, and do not give up easily when facing challenges. The results of the study showed that self-efficacy had a significant positive influence on mathematics learning outcomes, even contributing 65.3% to student learning achievement(Fitriani & Pujiastuti, 2021). The findings confirm that increasing self-efficacy is a strategic step in efforts to improve the quality of overall mathematics learning.

Regarding learning models, various studies show that flipped classroom is one of the innovative approaches that are effective in increasing student self-efficacy. This model shifts the traditional learning paradigm that was originally oriented to the knowledge that teachers have to be oriented to their students. In its application, students need to independently utilize various media such as learning videos, digital modules, e-learning platforms to learn outside the classroom. After that, student activities in the classroom can be used to discuss, collaborate, and solve problems with each other(Damayanti & Afriansyah, 2024)

This transformation in the learning structure has a significant impact on the formation of student self-efficacy. When students are given the opportunity to learn independently, they are trained to manage their own learning process, from understanding the material to evaluating its comprehension. This process gradually builds a sense of responsibility, independence, and confidence in students' abilities. In addition, classroom learning activities that emphasize discussion and problem-solving provide students with hands-on experience in applying the knowledge they have learned beforehand. This is reinforced by the finding that the use of the flipped classroom model can significantly improve students' self-efficacy and math learning outcomes(Husna et al., 2025)

Furthermore, the results of the synthesis show that the application of this model has an impact on the affective and cognitive aspects of its students. They have a tendency to solve problems better than groups with conventional learning methods. This ability improvement is closely related to (Widiantika et al., 2025)self-efficacy, because success in completing tasks will strengthen students' confidence in their abilities. Judging from the findings above, cognitive ability and self-efficacy have a mutual relationship that strengthens each concept.

When viewed from the perspective of Bandura's theory, the increase in self-efficacy in flipped classroom can be explained through the mastery experience obtained by students during the learning process. Flipped classrooms provide a wider space for students to experience success through self-paced practice before classroom learning. When students manage to understand the material independently, this will increase their confidence that they are able to master the material given. In contrast, in conventional learning, the opportunity to experience success independently is relatively more limited because students rely more on the teacher's explanations.

In addition, flipped classrooms also facilitate the formation of vicarious experiences, which are learning experiences through observation of the success of others. In group discussion activities, students can see how their peers solve problems, thus giving rise to the belief that they also have the same abilities. This social interaction is one of the important factors in strengthening self-efficacy, because students not only learn individually, but also socially.

The results of previous research also showed that flipped classroom had an effect on other variables closely related to self-efficacy, such as learning independence, critical thinking skills, and students' anxiety levels. Research shows that most students show a good level of learning independence after following flipped classroom learning(Damayanti & Afriansyah, 2024). This learning independence plays an important role in increasing self-efficacy, because students feel they have control over the learning process they are undergoing.

In addition, flipped classrooms have also been proven to be able to improve critical thinking skills and reduce students' math anxiety levels. This decrease in anxiety is an important factor in the formation of self-efficacy, because high anxiety is often the main obstacle in the learning process. When students feel more comfortable and less stressed in learning, they tend to be more confident and courageous in facing academic challenges.

However, the results of the research synthesis also show that the effectiveness of flipped classrooms is not universal. Not all students respond positively to this learning model. Students who are not used to independent learning tend to have difficulty adapting, especially in terms of time management, learning discipline, and understanding the material independently. This shows that students' initial (Dorie et al., 2021)self-efficacy levels also affect the success of the flipped classroom implementation.

In addition to the pedagogical factor, the use of technology is also an important element in the flipped classroom. The integration of technologies such as e-learning and augmented reality has been proven to be able to improve students' self-efficacy because it provides a more interactive, flexible, and contextual learning experience. Technology allows students to access the material repeatedly as needed, thereby increasing understanding and confidence in learning(Khodabandeh & Mombini, 2024).

Overall, the results of the analysis show that the dynamics of self-efficacy in flipped classrooms are complex and influenced by various factors that interact with each other, such as learning design, student readiness, the role of teachers, and technological support. Flipped classrooms have great potential in increasing student self-efficacy through independent learning experiences, social interactions, and flexible and adaptive learning environments. However, its implementation needs to be carefully designed in order to have an optimal impact on the development of student self-efficacy in mathematics learning.

Self-Efficacy Analysis in Flipped Classroom-Based Math Learning

The results of the analysis show that self-efficacy is a psychological construct that has a fundamental role in determining the success of mathematics learning. Self-efficacy is not only related to an individual's belief in his or her abilities, but also affects how individuals process information, manage emotions, and make decisions in dealing with academic tasks. In math learning that is known to be complex and challenging, self-efficacy serves as a key factor that distinguishes students who are able to survive and thrive from students who experience learning barriers(Fitriani & Pujiastuti, 2021).

Analytically, self-efficacy can be understood as a variable that has a direct relationship with student motivation, engagement, and learning strategies. Students with low self-efficacy tend to show less adaptive behavior patterns, such as avoiding difficult tasks, having high levels of anxiety, and being less active in the learning process. This condition has an impact on the low quality of student interaction with the material and the learning environment. These findings are in line with research showing that low student confidence contributes to the formation of negative perceptions of mathematics and decreased motivation to learn(Husna et al., 2025).

In contrast, students with high self-efficacy show more constructive behavioral tendencies in learning. They are better able to survive in the face of difficulties, have higher perseverance, and are able to develop effective learning strategies. From a cognitive perspective, students with high self-efficacy are better able to manage thought processes, such

as understanding concepts, connecting information, and solving problems systematically. From a metacognitive perspective, they are also better able to plan, monitor, and evaluate their own learning process. This shows that self-efficacy not only functions as an affective factor, but also has a close relationship with cognitive and metacognitive processes in learning.

In flipped classrooms, the analysis showed a significant relationship between the characteristics of the learning model and the formation of self-efficacy. Flipped classroom places students as the center of learning by giving them greater responsibility in understanding the material independently before classroom activities. This structure differs fundamentally from conventional learning which tends to be teacher-centric. Thus, flipped classrooms create a learning environment that demands students' active involvement in the process of knowledge construction.

From an analytical point of view, flipped classroom contributes to self-efficacy through several key mechanisms. First, this model increases the intensity of students' cognitive engagement because they must understand the material independently before learning in class. Second, flipped classrooms encourage social engagement through discussion and collaboration activities in the classroom, which enrich students' understanding of the material. Third, this model improves the quality of the learning experience because students not only receive information, but also apply and evaluate the knowledge gained.

If associated with Bandura's theory, the contribution of flipped classrooms to self-efficacy can be analyzed through four main sources. Mastery experience is obtained through students' success in understanding the material independently. Vicarious experience arises through observation of peer success in discussion. Verbal persuasion occurs through feedback given by teachers and friends. Meanwhile, physiological states are related to the emotional state of students who become more positive in a flexible learning environment. These four aspects show that flipped classroom provides conditions that support the formation of self-efficacy comprehensively.

In addition, flipped classrooms also contribute to increasing student learning independence. Analytically, learning independence is a variable that has a reciprocal relationship with self-efficacy. Students who have high learning independence tend to have better self-efficacy, and vice versa. Research shows that flipped classrooms are able to significantly increase students' learning independence. This strengthens the argument that this learning model not only has an impact on the cognitive aspect, but also on the psychological aspect of the student.(Damayanti & Afriansyah, 2024)

The integration of technology in flipped classrooms is also an important factor in this analysis. Technology allows for more interactive, flexible, and accessible presentation of materials. From an analytical point of view, this flexibility increases students' learning control, which ultimately contributes to increased self-efficacy. In addition, the ability to repeat material provides an opportunity for students to reinforce comprehension without pressure, thereby reducing anxiety and boosting confidence(Stephanus, 2025).

However, the analysis also shows that the effectiveness of flipped classrooms is not universal. Variations in initial abilities, self-efficacy levels, and students' readiness to learn are factors that affect the success of the implementation of this model. Students with low self-efficacy tend to have difficulty adjusting to independent learning, so they need more intensive support. Therefore, the role of teachers as facilitators is very important in ensuring that all students can adapt well to this learning model(Kurniawan & Mashuri, 2021).

Overall, this analysis shows that flipped classroom is a learning model that has strong potential in increasing student self-efficacy. However, its success depends heavily on the interaction between learning design, student characteristics, and learning environment support. Thus, self-efficacy in the flipped classroom can be understood as the result of a complex interaction between cognitive, affective, and pedagogical factors.

Dynamics of Self-Efficacy in Flipped Classroom-Based Mathematics Learning

The dynamics of student self-efficacy in flipped classroom-based mathematics learning is a developmental process that takes place gradually, continuously, and is influenced by repeated learning experiences and social interactions that occur during learning. Self-efficacy is not formed instantly as a result of a single learning experience, but rather develops through a series of changes in the cognitive, affective, and social aspects of students. These changes include how students perceive their abilities, how they respond to learning challenges, and how their emotional state develops along with the learning experience.

In the early stages of learning, students are generally in an unstable state of self-efficacy. The transition from conventional learning to flipped classroom-based learning that requires independence often causes confusion and doubts about one's abilities. Students who were previously accustomed to receiving direct explanations from teachers must begin to adjust to independent learning patterns, which in many cases is challenging. This uncertainty can lead to a lack of confidence, especially when students are not able to understand the material optimally. Therefore, at this stage self-efficacy tends to be volatile, influenced by the initial success or failure experienced by students. This stage can be understood as the adaptation phase, where students begin to recognize the demands and characteristics of the new learning environment.

As time goes by, students begin to enter the exploration phase, which is the stage where they begin to interact more actively with the available learning resources. In this phase, students begin to get used to the use of learning videos, digital modules, and various other media that support independent learning. The ability to manage study time, choose appropriate study strategies, and repeat material as needed becomes a new experience that gradually builds confidence. The initial understanding gained through this process of exploration, although not perfect, provides an important foundation for the development of self-efficacy. At this stage, students begin to realize that they have the ability to understand the material independently, which is the starting point for the formation of confidence in their own abilities.

The development of self-efficacy becomes more real and significant when students enter the phase of active participation in learning in the classroom. At this stage, learning activities are focused on discussion, collaboration, and problem-solving that demand active student involvement. Students not only rely on individual understanding, but also interact with peers and teachers to deepen their understanding. This social interaction plays an important role in strengthening self-efficacy, as students gain the opportunity to compare, confirm, and improve their understanding. Observation of peer success in solving problems, as well as involvement in group discussions, are factors that accelerate the development of self-efficacy through social experiences. In this phase, there is a clear shift from doubt to stronger self-confidence.(Algarni, 2021)

In addition to cognitive and social aspects, the dynamics of self-efficacy are also reflected in changes in students' emotional states during the learning process. In the early stages, students tend to experience anxiety, especially when facing math material that is considered difficult. However, as understanding and engagement in learning increases, such anxiety gradually decreases. A more flexible and non-stressful flipped classroom environment allows students to learn without excessive fear of error. This decrease in anxiety contributes significantly to increased self-efficacy, as students begin to feel more comfortable and confident in dealing with learning tasks.(Segumpan & Tan, 2018)

Repeated learning experiences are also an important factor in strengthening the dynamics of self-efficacy. The success experienced by students, even on a small scale, provides a positive reinforcement that is cumulative to self-confidence. Any success in understanding concepts, answering questions, or participating in discussions will reinforce the perception that they are capable of facing learning challenges. On the other hand, failure does not always have

a negative impact, because in a flipped classroom students have the opportunity to correct mistakes through repetition of material and reflection on learning. Thus, the learning process becomes more adaptive and supports the development of self-efficacy in a sustainable manner.

The use of technology in flipped classrooms also strengthens the dynamics of student self-efficacy development. Flexible access to learning materials allows students to learn anytime and anywhere according to their needs. Technology also allows for more interactive and engaging presentation of materials, thereby increasing student engagement in learning. Additionally, the ability to repeat material provides a sense of control over the learning process, which ultimately increases students' confidence. This shows that technology not only serves as a medium of learning, but also as a factor that accelerates and strengthens the development of self-efficacy(Khodabandeh & Mombini, 2024).

However, the dynamics of self-efficacy do not take place uniformly in every student. Each student has different characteristics, experiences, and learning readiness, so the process of self-efficacy development also varies. Some students are able to adapt quickly and show significant improvements in self-efficacy, while others take longer to achieve the same level of confidence. This variation suggests that the dynamics of self-efficacy are individual and are influenced by complex interactions between internal factors, such as motivation and initial ability, as well as external factors, such as the learning environment and support from teachers.

Thus, the dynamics of self-efficacy in flipped classroom-based mathematics learning can be understood as a developmental process that involves several main phases, namely the adaptation, exploration, participation, and reinforcement phases. Each phase reflects the changes that occur in the cognitive, affective, and social aspects of the student gradually. This process emphasizes that self-efficacy is not a static condition, but a construct that continues to evolve along with the learning experience experienced by students. Thus, flipped classroom not only serves as an innovative learning model, but also as a learning environment that actively shapes and develops students' self-efficacy in a sustainable manner.

CONCLUSION

The conclusion of this study shows that self-efficacy is a very crucial psychological factor in mathematics learning, because it not only affects learning outcomes, but also determines the level of motivation, engagement, perseverance, and how students respond to various academic challenges. Self-efficacy plays a key determinant that distinguishes students who are able to survive and thrive from students who tend to experience learning barriers. Therefore, the development of self-efficacy is one of the important aspects that need to be considered in the mathematics learning process. In flipped classroom-based learning, self-efficacy is not formed instantly, but develops dynamically through a gradual and continuous process of learning experience. These dynamics are reflected through several phases, namely the adaptation, exploration, participation, and reinforcement phases, which show changes in the cognitive, affective, and social aspects of students. Flipped classroom provides a meaningful learning experience through independent learning activities, discussions, and problem-solving, thus encouraging students to be more active and responsible for their learning process. In addition, this model also supports the formation of sources of self-efficacy, such as success experiences, observation of others, social support, and more positive emotional states. Thus, flipped classroom not only plays a role in improving students' cognitive abilities, but also contributes significantly to shaping and developing students' self-efficacy in an ongoing manner. However, the effectiveness of the implementation of this model is greatly influenced by the readiness of students in independent learning, the role of teachers as facilitators who provide guidance and feedback, and the use of technology that supports the learning process optimally. The suggestion that can be given is that teachers are advised to implement the flipped classroom model in a planned and gradual manner by paying attention to students' readiness in

independent learning. Teachers also need to provide sufficient guidance, feedback, and support, especially for students with low self-efficacy to be able to adapt to this learning model. In addition, the use of technology needs to be optimized to support the flexibility and meaningfulness of learning. The next research is expected to examine more deeply the learning strategies that are able to accommodate the differences in student characteristics in the flipped classroom, as well as explore the dynamics of self-efficacy through empirical data directly in the field.

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