

Flipped Classroom's Impact on Critical Thinking, Active Learning and Motivation: A Critical Review

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Abstract

This critical review aims to evaluate the impact of the flipped classroom model in critical thinking, active learning, and motivation among students. The review examines empirical studies published in the past four years, analysing the methodology, findings and limitations of these studies. The literature search was conducted using relevant keywords on the Google Scholar platform, and strict inclusion criteria were applied to ensure high-quality, peer-reviewed articles from respected databases were included in the review. The findings of this critical review highlight a dearth of high-quality research on flipped classrooms in Malaysia, with only a few studies focusing on the impact of flipped classrooms on critical thinking, active learning and motivation. The review reveals a significant gap in the literature, particularly in articles that address all three aspects of the theme. Most of the articles focus on the effects of active learning, with limited research on critical thinking and motivation. The review recommends further research on the impact of flipped classrooms on critical thinking and motivation, as well as more qualitative research to gain insights into students' experiences. It emphasises the need for a more comprehensive understanding of the pedagogical advantages of flipped classrooms, particularly in enhancing critical thinking and motivation among students. The findings of this review contribute to the existing literature and provide directions for future research and practice in the field of flipped classrooms.

Keywords: Flipped Classroom, Active Learning, Motivation, Critical Learning, Critical Review

Introduction

Over the past decade, the flipped classroom has gained popularity as a teaching approach that aims to enhance students' critical thinking, active learning, and motivation. A flipped classroom replaces traditional lectures with online resources outside of class and emphasises collaborative problem-solving and discussion during in-class time (Hall & DuFrene, 2016). The effectiveness of the flipped classroom approach has been a topic of much debate and research in recent years. While some studies suggest that flipped classrooms can improve student learning outcomes, others have found no significant difference in student performance compared to traditional classroom approaches. Given the growing interest in

the flipped classroom model, it is important to critically review the literature and examine the impact of this approach on critical thinking, active learning, and motivation.

Research has shown that the flipped classroom model has been positively received by teachers, with many acknowledging its potential benefits for promoting student-centered learning (Kiang & Yunus, 2021). Despite these challenges, the effectiveness of the flipped classroom approach has been demonstrated in various studies, with students reporting higher levels of engagement and improved academic performance (Ruslan et al., 2022; Aido et al., 2022). In fact, some teachers have noted that the flipped classroom approach has helped to foster greater student participation and active learning, leading to better learning outcomes (Aido et al., 2022)

The concept of “active learning” has gained widespread recognition among educators. This approach emphasizes the importance of engaging students in the learning process, rather than simply having them sit and listen to lectures. Active learning encourages students to actively participate in discussions, relate what they are learning to their own experiences, and write about their insights (Chickering & Gamson, 1987). By doing so, students not only gain a deeper understanding of the material but also develop critical thinking and problem-solving skills. As such, active learning is an essential component of modern education that can help students succeed both in and outside the classroom. To develop critical thinking, it is essential to incorporate various instructional methods based on active learning (Walker, 2003). Methods of active learning, such as posing questions, debating and completing written exercises, can assist students in actively participating with the material and enhance their ability to think critically. Additionally, these methods can encourage students to become more engaged and become self-sufficient learners (Walker, 2003).

The purpose of this critical review is to unpack the flipped classroom model and evaluate its impact on critical thinking, active learning, and motivation. This review will consider a range of empirical studies published in the past four years, which examine the impact of flipped classroom on students' critical thinking, active learning, and motivation. The review will analyse the methodology, findings, and limitations of these studies, and provide recommendations for future research and practice.

Critical Review

A literature review piece evaluates the existing literature related to a particular topic, theory, or method and integrates previous studies to contribute to the existing pool of knowledge (Paul & Criado, 2020). While a narrative review may be biased due to the personal interpretation of article relevance, a systematic review categorizes existing understanding through a critical review or meta-analysis. In this study, a critical review was chosen to investigate the current knowledge on the impact of flipped classroom towards critical thinking, active learning, and motivation towards students. This decision was made as it does not require effect size analysis. By using a critical review, we were able to thoroughly examine and evaluate the existing literature to inform this research.

Formulation of the Problem to be Addressed

The primary objective of this critical reviews is to delve into the existing body of knowledge regarding the impact of the flipped classroom on critical thinking, active learning, and motivation. Put simply, we can express the problem being addressed as the following question: How extensive has the scholarly research been in the last four years regarding the

impact of flipped classroom on active learning, critical thinking, and motivation? Specifically, how many journal publications have tackled this critical topic?

Data Collection and Analysis

Prior to selection based on relevance, a comprehensive search of all relevant articles was diligently conducted. To accomplish this, relevant keywords related to flipped classroom, active learning, critical thinking, and motivation were used to conduct a thorough search for articles on the Google Scholar platform. To conduct a meticulous and rigorous critical review, only articles of high quality should be deemed suitable for inclusion. "Garbage in, garbage out" is applied in this process. "Garbage in, garbage out" refers to the idea that the quality of the output from a process is only as good as the quality of the input. In other words, if the process's input data or method is flawed, the output will be flawed or inaccurate. This concept is frequently used in computer programming and data analysis, but it can also be applied to other areas where decisions are based on information or data.

A series of carefully chosen filters were used to ensure that only the most relevant documents were obtained for this critical review. One of the key filters implemented was to focus solely on publications from the last four years. This was done to ensure that the most current and up-to-date information was included, given the rapid pace of technological change and the frequent emergence of new knowledge in the field.

To ensure that only high-quality, peer reviewed articles were included in this critical review, strict criteria were put in place. Specifically, only publications sourced from respected databases such as Scopus and Web of Science Journal (WOS) were included. This ensured that the articles reviewed met rigorous standards for academic quality and integrity.

The study was purposefully limited to the field of education because the primary focus of this critical review was on the impact of flipped classroom on students in school. This allowed for a more in-depth investigation of the specific educational contexts in which flipped classroom techniques were used, allowing the analysis to be more closely tailored to the needs and experiences of students and educators in these settings.

Reporting of the Results

After applying all the filters, a total of 12 relevant journals were successfully obtained, which directly pertained to the focus of the study. The articles have been further categorized into their respective themes. However, it was discovered that some of the articles belonged to more than one theme. Table 1 displays the frequency of articles pertaining to the theme of flipped classroom and its impact on critical thinking, active learning, and motivation.

Table 1

Frequency of articles on the theme of critical thinking, active learning and motivation

CRITICAL THINKING	N	ACTIVE LEARNING	N	MOTIVATION	N
Prior knowledge	3	Video lecture increase active learning	1	Confidence	3
Creative problem-solving	1	Collaboration with peers	3	Satisfaction	4
Constructive Questions	1	Student-centred	5	Video lecture increase motivation	1
		Enhanced interaction teacher-students	2		
		Enhanced interaction students-students	3		
Total	5		14		8

The initial finding of this systematic review highlights the dearth of high-quality and peer-reviewed research on flipped classrooms conducted in Malaysia. Over the past four years, there have been only a few studies that examine the impact of flipped classrooms on active learning, critical thinking, and motivation as shown in Table 2 and subsequently explained. This critical review reveals a significant gap in the literature, specifically the scarcity of articles that address all three aspects of the theme: critical thinking, active learning, and motivation. A mere 42% of all articles reported findings on two of the themes, while majority of articles focused solely on one. This gap in knowledge clearly indicates a need for further research on the impact of flipped classrooms on critical thinking, active learning, and motivation.

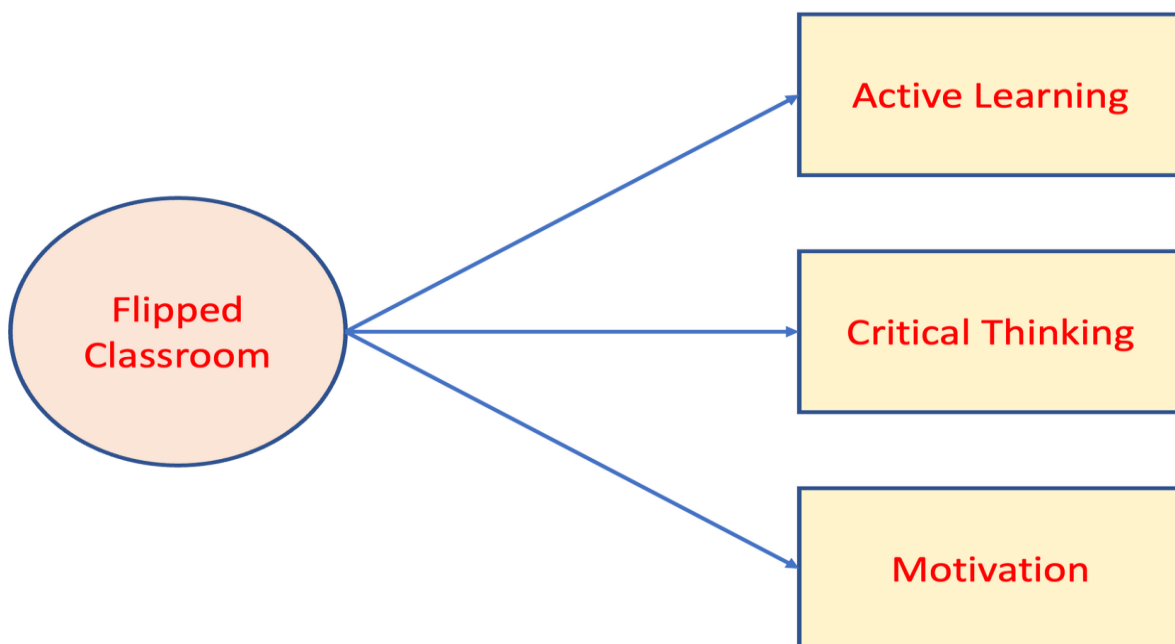


Figure 1. Conceptual framework

Table 2

Systematic Literature Review towards 12 Journals

Writer	Year	Title	Journal	SC/WOS	FC	M	AL	CT	MY	Country	Methods
Dutta, R., Mantri, A., Singh, G., Malhotra, S., & Kumar, A	2020	Impact of flipped learning approach on students motivation for learning digital electronics course	<i>Integration of Education</i>	/	/	/				India	Questionnaire
Purwanti et al	2022	Video Lectures in Online EFL Flipped-Classroom: Effectiveness, Students' Evaluation and Experiences	<i>European Journal of Educational Research</i>	/	/	/	/			Indonesia	Pre-post test Questionnaire Interview
Li Ke, Lanlan Xu, Li Sun, Juan Xiao, Lingxuan Tao, Yixue Luo, Qiongya Cao and Yan L	2023	The effect of blended task-oriented flipped classroom on the core competencies of undergraduate nursing students: a quasi-experimental study	BioMed Central Ltd	/	/		/	/		China	Pre-post test
Hussain et al	2020	A quasi-qualitative analysis of flipped classroom implementation in an engineering course: from theory to practice	<i>International Journal of Educational Technology in Higher Education</i>	/	/		/			Australia	Questionnaire Quasi-qualitative
Sayyed Mortaza Mardiha, Goudarz Alibakhshi Masoumeh Mazloum and Reza Javaheri	2023	Electronic Flipped Classrooms as a Solution to Educational Problems Caused by COVID 19: A Case Study of a Research Course in Iran Higher Education	<i>Electronic Journal of e-learning</i>	/	/		/			Iran	Pre-post test
Bin-Hady & Hazaea	2020	EFL students' achievement and attitudes towards flipped pronunciation class: correlational study	<i>Emerald Insight</i>	/	/	/				Arab	Questionnaire Interview
Rahayu et al	2022	The Effectiveness Of Creative Problem Solving-Flipped Classroom For	<i>Jurnal Pendidikan IPA</i>	/	/		/			Indonesia	Pre-post test

		Enhancing Students' Creative Thinking Skills In Online Physics Educational Learning	Indonesia								
Hasan Baloch et al	2022	Does the Implementation of Flipped Classroom Model Improve the Learning Outcomes of Medical College Students? A Single Centre Analysis	<i>Journal of the College of Physicians and Surgeons Pakistan</i>	/	/	/	/			Pakistan	Questionnaire
Aydin & Demirer	2022	Are flipped classrooms less stressful and more successful? An experimental study on college students	<i>International Journal of Educational Technology in Higher Education</i>	/	/	/	/			Turkey	Questionnaire Pre-post test
Keshmiri	2019	<i>The Effect of Blended Learning Approaches in Faculty Development Programs</i>	Strides in Development of Medical Education Journal	/	/	/				Iran	Questionnaire
Guo, J	2019	The use of an extended flipped classroom model in improving students' learning in an undergraduate course	<i>Journal of Computing in Higher Education</i>	/	/	/	/			USA	Questionnaire Interview
Öztürk & Çakıroğlu	2021	Flipped learning design in EFL classrooms: implementing self-regulated learning strategies to develop language skills	<i>Smart Learning Environments</i>	/	/						Pre-post test

SC = SCOPUS , WOS = WEB OF SCIENCE, FC = FLIPPED CLASSROOM, M = MOTIVATION, AL = ACTIVE LEARNING , CT = CRITICAL THINKING, MY = MALAYSIA

Many publications discuss the effects of active learning, which scored 51% across all academic literature while scoring only 19% for critical thinking and 30% for motivation. A total of 19% concur that student-centred learning, in which students have the option to choose what they will learn, how they will learn it, and even when they will study it, has been greatly influenced using flipped classrooms. Satisfaction is another aspect that is widely discussed, with many articles indicating that students exhibit high levels of satisfaction when learning in a flipped

classroom environment. This satisfaction arises from students being able to see their own progress and abilities.

While most of the articles found to only discuss about the effectiveness of flipped classrooms in enhancing the academic achievement, there is a noticeable dearth of literature that investigates the impact of flipped classrooms on both critical thinking and motivation. It is recommended that further research be conducted on both critical thinking and motivation domains in flipped classrooms to uncover additional benefits. While there is already considerable body of research on the pedagogical advantages of flipped classrooms, there is still much to be learned about how this teaching model can enhance critical thinking and motivation among students.

It is also recommended that more qualitative research be conducted to gain a deeper understanding of the challenges associated with implementing flipped classrooms in all three aspects: critical thinking, active learning, and motivation. While there is already some research on these topics, much of it has been quantitative and focused on measuring the impact of flipped classrooms on learning outcomes. By using qualitative research techniques like interviews, case studies, and observations, it is possible to gain a deeper understanding of the difficulties that instructors and students may have when implementing flipped classroom models and to identify practical solutions. Researchers can offer more complex insights that can enhance the efficacy of this cutting-edge teaching strategy by investigating the difficulties connected with implementing flipped classrooms from a qualitative perspective. Consequently, it is crucial to carry out additional qualitative research to completely comprehend the difficulties involved in implementing flipped classrooms and to find solutions.

Way Forward

Based on the gap identified in the critical review, an instrument was developed as outlined in Appendix 1 to measure students' perception of (i) their own motivation after engaging in flipped classrooms, (ii) their active learning experience using flipped classrooms, and (iii) their critical thinking with flipped classrooms. To ensure the validity of the instrument, content validation was sought from education experts to ensure that it accurately measures the intended constructs. Their expertise and input were invaluable in refining the instrument. Furthermore, a pilot test will be conducted to gather feedback from a small sample of students. This feedback will be use to make any necessary adjustments to the instrument before proceeding with the main data collection. Additionally, a reliability test will be conducted to ensure that the instrument produces consistent and reliable results. These steps are taken to develop a robust instrument that can effectively measure students' perception of their own motivation, active learning experience and critical thinking skills in the context of flipped classrooms. This will contribute to the validity and reliability of the research findings, providing a solid foundation for the study.

Conclusion

The critical review of the literature revealed several gaps that need to be addressed in future research. Firstly, there is a lack of research conducted in Malaysia that investigates the impact of flipped classrooms on critical thinking, active learning and motivation. Secondly, most studies have only focused on academic achievements, and there is a need for more research to examine all three themes simultaneously. Thirdly, there is a lack of research on these three themes in the past four years, indicating a need for more recent studies to address the

changing landscape of education. Finally, there is a need for more research that utilizes qualitative methods to gain a deeper understanding of the challenges associated with implementing flipped classrooms in these three themes. Addressing these gaps in research will help to further our understanding of the potential benefits of flipped classrooms for promoting critical thinking, active learning and motivation and provide insights into effective strategies for overcoming the challenges associated with their implementation.

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References

- Hall, A. A., & DuFrene, D. D. (2016). Best Practices for Launching a Flipped Classroom. *Business and Professional Communication Quarterly*, 79(2), 234-242.
- Paul, J., & Criado, A. R. (2020). "The art of writing literature review : What do we know and what do we need to know?". *International Business Review*, 29(4), 1-7.
- Kiang, N. H., & Yunus, M. M. (2021). What do malaysian ESL teachers think about flipped classroom?. *International Journal of Learning, Teaching and Education Research*, 20(3), 117-131.
- Ruslan, M. S. H., Sapiee, N. H., Kurnia, K. A., Amran, N. A., & Abd Rahman, N. (2022). Student Adoption and Effectiveness of Flipped Classroom Implementation for Process Simulation Class. *Education Sciences*, 12(11), 763, 1-14.
- Aidoo, B., Macdonald, M. A., Vesterinen, V. -M., Pétursdóttir, S., & Gísladóttir, B. (2022). Transforming teaching with ICT using the flipped classroom approach: Dealing with COVID-19 pandemic. *Education Sciences*, 12(6), 421,1-12.
- Chickering, A. W., & Gamson, Z. F. (1987). Seven Principles for Good Practice in Undergraduate Education. American Association for Higher Education, Washington, D.C., 3-7.
- Walker, S. E. (2003). Active learning strategies to promote critical thinking. *Journal of Athletic Training*, 38(3), 263- 267.
- Dutta, R., Mantri, A., Singh, G., Malhotra, S., & Kumar, A. (2020). Impact of flipped learning approach on students motivation for learning digital electronics course. *Integration of Education*, 24(3), 453-464.
- Purwanti, I. T., Suryawati, E., & Eliwanti. (2022). Video lectures in online EFL flipped-classroom: Effectiveness, students' evaluation and experiences. *European Journal of Educational Research*, 11(2), 885-898.
- Ke, L., Xu, L., Sun, L., Xiao, J., Tao, L., Luo, Y., Cao, Q., Li, Y. (2023). The effect of blended task-oriented flipped classroom on the core competencies of undergraduate nursing students: a quasi-experimental study. *BMC Nursing*, 22(1), 1-10.
- Hussain, S., Jamwal, P.K., Munir, M. T. & Zuyeva, A. (2020). A quasi-qualitative analysis of flipped classroom implementation in an engineering course: from theory to practice. *International Journal of Educational Technology in Higher Education*. 17(43), 1-19.

Mardiha, S. M., Alibakhshi, G., Mazloun, M., Javaheri, R. (2023). Electronic Flipped Classrooms as a Solution to Educational Problems Caused by COVID 19: A Case Study of a Research Course in Iran Higher Education, *The Electronic Journal of e-Learning*, 21(1), 26-35.

Bin-Hady, W.R.A. and Hazaea, A.N. (2022). EFL students' achievement and attitudes towards flipped pronunciation class: correlational study, *PSU Research Review*, 6 (3), 175-189.

Rahayu, S., Setyosari, P., Hidayat, A., Kuswandi, D. (2022). The Effectiveness of Creative Problem Solving-Flipped Classroom For Enhancing Students' Creative Thinking Skills in Online Physics Educational Learning. *Jurnal Pendidikan IPA Indonesia*. 11(4), 649-656.

APPENDIX 1

Dear participant,

The purpose of this questionnaire is to gather information on your experiences and opinion regarding the flipped classroom and how it affects your engagement in the learning process. Your participation in this study is voluntary, and all responses will be kept confidential. Your feedback is valuable and will help us gain a better understanding of the effectiveness of the flipped classroom in promoting students' engagement in class as well as boosting the critical thinking skills and motivation in study. Please take your time to carefully read and answer the questions to the best of your ability. The questionnaire should take approximately 5-8 minutes to complete. Thank you for your time and participation.

SECTION A

Sex : Female Male
Age : _____
Module : Hayat Fizikal Komputer
Racial : _____
Place of origin : _____

How many times have you experienced a flipped classroom environment before?

<input type="checkbox"/>	1 times
<input type="checkbox"/>	2-3 times
<input type="checkbox"/>	Never

If yes, please specify at which level?

<input type="checkbox"/>	Primary
<input type="checkbox"/>	Secondary
<input type="checkbox"/>	Tuition

SECTION B

For each statement, please indicate the extent to which you agree or disagree by selecting a rating on a 5-point Likert scale. The scale ranges from :

- 1 Strongly Disagree
- 2 Disagree
- 3 Not sure
- 4 Agree
- 5 Strongly Agree

		1	2	3	4	5
1	The pre-class activities in the flipped classroom were helpful in preparing me for in-class activities					
2	I found the flipped classroom model to be more engaging than traditional teaching methods					
3	The flipped classroom model was effective in promoting student engagement in class					
4	I felt more confident asking questions in class after completing the pre-class activities					
5	I always felt ready in class after completing the pre-class activities					

SECTION C

For each statement, please indicate the extent to which you agree or disagree by selecting a rating on a 5-point Likert scale. The scale ranges from :

- 1 Strongly Disagree
- 2 Disagree
- 3 Not sure
- 4 Agree
- 5 Strongly Agree

		1	2	3	4	5
1	The flipped classroom model helped me to develop my critical thinking skills					
2	The pre-class activities in the flipped classroom model provided opportunities for me to think critically about the course material					
3	The flipped classroom model allowed me to apply critical thinking skills to real-world scenarios					
4	The flipped classroom model increased my ability to analyze and evaluate information					
5	The flipped classroom model allowed me to practice problem-solving skills in a supportive learning environment					
6	I felt more confident in my ability to think critically after participating in a flipped classroom course					

SECTION D

For each statement, please indicate the extent to which you agree or disagree by selecting a rating on a 5-point Likert scale. The scale ranges from :

- 1 Strongly Disagree
- 2 Disagree
- 3 Not sure
- 4 Agree
- 5 Strongly Agree

		1	2	3	4	5
1	The flipped classroom model increased my motivation to learn					
2	I felt more engaged in the course material as a result of the flipped classroom model					
3	The pre-class activities in the flipped classroom model were helpful in motivating me to attend class					
4	The flipped classroom model provided me with a sense of ownership over my learning					
5	I felt more motivated to participate in class discussions and activities as a result of the flipped classroom model					
6	The flipped classroom model allowed me to learn at my own pace, which increased my motivation to learn					
7	I felt more confident in my ability to learn after participating in a flipped classroom course					
8	The flipped classroom model was effective in promoting student motivation to learn					
9	I felt that the flipped classroom model had a positive impact on my motivation to learn					