

Flipped Classroom for Matriculation: Are Students and Teachers Ready?

Faharina Shaari, Intan Farahana Kamsin

Faculty of Education, Universiti Kebangsaan Malaysia (UKM), Bangi, Malaysia.

Corresponding Author's Email: intanfarahanakamsin@ukm.edu.my

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v14-i8/22427>

DOI:10.6007/IJARBSS/v14-i8/22427

Published Date: 08 August 2024

Abstract

This paper presents a comprehensive literature review on the readiness of students and teachers for implementing the flipped classroom approach. The flipped classroom is an instructional strategy that flips conventional methods of teaching and promotes students' active learning. This paper additionally explores the current status of research in this field and identifies areas where further investigation is needed. The literature highlights a profound and significant comprehension of the flipped classroom paradigm, its implementation in Malaysia, and the potential impact of student and teacher readiness of the approach's efficacy. The results suggested that more studies should be conducted to find out the readiness of teachers and students for flipped classrooms in matriculation or pre-university settings. A further investigation is required to offer useful insights and the formulation of education policies. In summary, this paper lays the groundwork for future research and strategies aimed at improving matriculation education through the application of the flipped classroom as a valuable 21st century instructional approach.

Keywords: Flipped Classroom, Readiness, Matriculation, Students, Teachers

Introduction

In education field, the convergence of pedagogy and educational technology has given rise to innovative approaches, potentially transforming the traditional teaching and learning methods. The rapid evolution of educational technology, combined with the transition of learners to generation Z in the digital age, demands the need for improvements and advancement in pedagogy. The flipped classroom model has offered a paradigm in pedagogy and is seen as capable of providing various benefits, particularly in terms of student engagement and achievement. This model involves students acquiring knowledge outside of class through the use of technology while utilizing class time for interactive activities such as discussion sessions and collaborative activities either through face-to-face or online.

The matriculation program is a pre-university education program in Malaysia aimed at producing excellent individuals to pursue undergraduate studies especially in science,

technology and professionals at higher education institutions. Matriculation students are individuals aged 18 to 19 who have completed *Sijil Pelajaran Malaysia* (SPM). The present matriculation cohort consists of generation Z individuals that demand teaching methods to go beyond the traditional approaches, embracing digital technology and prioritizing students-centered learning (Cilliers, 2017). Therefore, the integration of technology and innovative teaching methods is now a necessity and flipped classroom model have the potential to revolutionize educational practices in matriculation in order to equip students with 21st century skills and prepare them to face the challenges of the Fourth Industrial Revolution (IR 4.0) (Bishnoi, 2020; Juhary, 2019). The flipped classroom can help cultivate various critical skills that are necessary for students to succeed in both academic and professional domains such as problem-solving skills (Techanamurthy et al., 2020), critical thinking skills (Shaari et al., 2021), communication skills and collaborative skills (Mojtahedi et al., 2020). Therefore, the exploration of flipped classroom in matriculation or pre-university is imperative as the quality of education in this level affects students' ability to adapt and excel at the university which require individuals to be more independent and capable of self-directed learning.

Although the flipped classroom model is thought to be one of the effective student-centered strategies, there are few issues that need to be considered to ensure effective implementation. One concerning issue in the educational system is the reluctance to embrace change since teachers and students are less prepared and afraid of the uncertainties that come with it. There is a perception that the new approach might result in increase workload, other than having inadequate training and lack of support system. Students' and teachers' readiness is essential to ensure the successful implementation of the flipped classroom (Durak, 2020). Neglecting this issue can generally impact the effectiveness of the flipped classroom causing students to be unable to maximize the benefit from the active and collaborative learning experiences that are elements of the flipped classroom.

The readiness of students will determine the extent to which they are motivated, capable of self-directed learning and comfortable to participate in collaborative activities in flipped classroom. Meanwhile teachers who have higher readiness will find it easier to transition from traditional role of giving lecture to the role of facilitator in the flipped classroom. Understanding the readiness of students and teachers is a strategic first step in identifying potential barriers and ensuring the success of the flipped classroom implementation. Therefore, this paper will explore readiness towards flipped classroom, focusing on the context of Malaysian matriculation or pre-university program. This paper aims to contribute to existing literature by analyzing students' and teachers' readiness for the flipped classroom and to identify the knowledge gaps in this topic.

Literature Review

Flipped Classroom Model

The flipped classroom model was conceptualized around the year 2000 and gained attention from 2007 onwards through the efforts of two chemistry educators in the United States, Jonathan Bergmann and Aaron Sams who took initiative to record and upload instructional videos online for students to engage with outside of class hours (Agirman & Erkoskun, 2022). The flipped classroom inverts the traditional learning setting where the delivery of knowledge that is traditionally conducted face-to-face in class is now taking place outside class hours (Divjak et al., 2022). Consequently, this approach alters the roles of both teachers and

students where the teacher is no longer the main authority of knowledge and students transition from passive knowledge recipients to active learners (Deng, 2019). The design of flipped classroom encompasses pre-class, in-class and post-class phases. Before class, students are required to comprehend learning materials provided, often in the form of lecture videos or other digital learning resources. This pre-class learning activities require students to actively participate in independent learning have the potential to drive students to construct their own knowledge (Mojtahedi et al., 2020; Shaari et al., 2021). During class time, students work collaboratively in group to solve problem-based assignments that require critical thinking (Røe et al., 2019)

Flipped classroom has the potential to represent a shift towards hybrid, blended and flexible learning approaches. Previous study reported that students favor the flipped classroom where learning is perceived as more meaningful, particularly when it combines self-directed learning with synchronous classes, whether conducted online or in a hybrid mode, (Fructuoso et al., 2022). This model has the capability to contribute towards students' valuable learning experiences such as increased motivation (Afzali & Izadpanah, 2021; Bawaneh & Moumene, 2020; Darmawan, 2020; Zhao et al., 2021; Zhao & Yang, 2023), promote active learning (Ahmad Narihan et al., 2023; Parati et al., 2023) and improved academic performance (Ahmad & Arifin, 2020; Atwa et al., 2021; Basriyah et al., 2020; Nantha, 2022). Nevertheless, challenges persist among students where they struggle to adapt to the changed roles between students and teachers in the class (Sosa Diaz et al., 2021). Implementation issues in the flipped classroom encompass challenges during the pre-class phase characterized by insufficient student preparation, students face pressure when they fail to comprehend the preparatory learning materials and the difficult task to motivate high-achieving students to make adequate preparation (Ölmefors & Scheffel, 2023). Furthermore, teachers need to provide extensive materials for at-home learning while students must practice self-discipline to avoid distractions for other content when using technology for self-directed learning before class (Ali et al., 2022; Meliani et al. 2022)

Considering the potential benefits offered by flipped classroom as an innovative pedagogical approach to transform traditional learning in this digital age, research should be conducted to investigate flipped classroom in Malaysian matriculation institutions that prepare students for higher education in universities.

Flipped Classroom in Malaysia

In a study conducted by Hashim and Shaari (2020), it was observed that majority of school teachers in the northern region of Peninsular Malaysia perceive the flipped classroom approach as beneficial in enhancing teachers' knowledge and teaching skills to cater for the present Alpha generation students despite facing challenges in its implementation. Teachers implementing the flipped classroom reported a high level of perception, agreeing that this approach promotes self-directed learning, active learning and student-centered learning compared to conventional classroom (Kiang & Yunus, 2021). The benefits of flipped classroom also become apparent when students understand the learning content prior to class and subsequent discussion during class contribute to reinforcing acquired information and promoting higher-order thinking skills among students (Ruslan et al., 2022). Moreover, students participating in the flipped classroom show a more positive attitude towards learning (Halili et al., 2021; Zakaria & Yunus, 2020), demonstrate higher academic performance (Parati et al., 2023) and problem-solving skills (Techanamurthy et al., 2020). Despite the many positive impacts of flipped classroom, the implementation issues must be

considered, as evidenced by a study on 256 undergraduate students which revealed a low level of acceptance and less favorable perceptions towards this instructional approach (Chan et al., 2020).

Existing research on flipped classroom at the matriculation level, particularly in Malaysia is somewhat limited, with studies mostly focusing on module development (Malek et al., 2022) or applications (Lim et al., 2023) tailored for utilization within the flipped classroom framework. A GamyFlip-Pro module designed for a preuniversity Programming course which combines flipped classroom with gamification had effectively enhanced students' attitudes towards the course, notably in terms of achievement, motivation and active participation (Sulong et al., 2020). According to Kamarzaman et al. (2021) students in the Accounting Management course within the flipped classroom setting demonstrated significantly higher achievements compared to students in conventional class.

In conclusion, existing studies on the implementation of flipped classroom in matriculation reveals varied outcomes regarding its impact on students. However, based on the examination of recent trends in blended learning and the flipped classroom in Malaysia through the collection of articles from the Web of Science (WOS) database, it is evident that there is still lack of studies conducted at the matriculation level (Soon Tan et al., 2022). Therefore, there is an urgent need for further studies to investigate the flipped classroom approach in matriculation. Is this country's matriculation system ready to incorporate flipped classroom?

Readiness for Flipped Classroom

The readiness of students and teachers presents a possible barrier in flipped classroom implementation. Teachers must adjust to their new role as facilitators of learning rather than simply delivering lectures while students must take accountability for the learning process by engaging in self-directed learning. This calls for a shift in the mindset and readiness of both teachers and students to embrace the flipped classroom approach (Xu & Shi, 2018). Readiness refers to the degree to which teachers and students possess the willingness and capability to implement flipped classroom. Previous study conducted on future Geography teachers has indicated a strong and significant positive correlation between readiness for the flipped classroom and the actual implementation (Mahat et al. 2021). It has also been discovered that teacher and student readiness positively influence one another; students will always be ready if their teachers are ready (Kazu & Yalçin, 2022). The flipped classroom approach has proven to be successful because of the students' readiness for groupwork and self-directed learning (Fox & Docherty, 2019). Furthermore, a high level of students' readiness will foster greater enthusiasm for active involvement in the flipped classroom, hence facilitating the successful execution of this pedagogical approach (Wut et al., 2022).

There are various factors that influence the readiness for implementation of flipped classroom. A study by Kazu and Yalçin (2022) reveals that dimension of technology self-efficacy is deemed to be highly relevant as a determining factor for readiness among students and teachers. In order to effectively conduct the flipped classroom, both students and teachers must possess confidence and self-belief in using technology. Students' opinions of the flipped classroom are more favourable when they believe they are proficient with technology (Kazu & Kurtoğlu, 2020). The readiness for the flipped classroom also depends on the students' and teachers' willingness and ability to make preparations needed prior to the flipped classroom sessions (Kazu & Yalçin, 2022). To ensure the success of flipped classroom, teachers prepare by creating online educational resources for students to use at their own

pace while students prepare by having the willingness to use the resources provided by teacher before class (Agyei & Razi, 2022). Moreover, because teachers must demonstrate a high level of commitment to create instructional design and implementing the flipped classroom, institutional support is seen as another critical dimension influencing teachers' readiness to adopt the approach (Ruslan et al., 2022; Wanner & Palmer, 2015).

Past Related Studies

	Authors	Year	Title	FC	Ready	Pre-U	Country	Educational institution	Data analysis
1	Ahmad Narihan et al.	2023	Time to Flip? Feedback from UNIMAS Medical Students Towards Implementation of Flipped Pathology Classroom	/			Malaysia	University	Quantitative & Qualitative
2	Parati et al.	2023	Assessing the Effects of Flipped Classroom to the Primary Pupils' English Learning Performance	/			Malaysia	School	Quantitative
3	Ruslan et al.	2022	Student adoption and effectiveness of flipped classroom implementation for process simulation class	/			Malaysia	University	Quantitative & Qualitative
4	Polat et al.	2022	The association between flipped learning readiness, engagement, social anxiety, and achievement in online flipped classrooms: a structural equational modeling.	/	/		Turki	University	Quantitative
5	Ali et al.	2022	Effectiveness of flipped classroom model through multimedia technology in improving students' performance in directed numbers.	/			Brunei	School	Quantitative & Qualitative
6	Wut et al.	2022	University student readiness and its effect on intention to participate in the flipped classroom setting of hybrid learning	/	/		China	University	Quantitative
7	Reddy et al.	2021	The Role of Motivation in Incidental Vocabulary Learning through Academic Videos	/			Malaysia	University	Quantitative
8	Halili et al.	2021	Student perceptions towards the use of the mobile flipped classroom approach	/			Malaysia	University	Quantitative
9	Kiang & Md Yunus	2021	What do Malaysian ESL Teachers Think About Flipped Classroom?	/			Malaysia	School	Quantitative & Qualitative

10	Shaari et al.	2021	Investigating the impact of flipped classroom on dual language learners' perceptions and grammatical performance	/		Malaysia	Vocational college	Quantitative & Qualitative
11	Velde et al.	2021	'The idea is nice... but not for me': First-year students' readiness for large-scale 'flipped lectures'—what (de) motivates them?	/	/	Belanda	University	Quantitative & Qualitative
12	Techanamurthy et al.	2020	A problem-solving flipped classroom module: Developing problem-solving skills among culinary arts students	/		Malaysia	Community college	Quantitative
13	Zakaria & Yunus	2020	Flipped classroom in improving ESL primary students' tenses learning.	/		Malaysia	School	Quantitative
14	Chan et al.	2020	Student's perception on initial experience of flipped classroom in pharmacy education: Are we ready?.	/		Malaysia	University	Quantitative
15	Chou et al.	2020	Developing and validating a scale for measuring teachers' readiness for flipped classrooms in junior high schools	/	/	Taiwan	School	Quantitative & Qualitative
16	Durak	2020	Modeling different variables in learning basic concepts of programming in flipped classrooms.	/	/	Turki	University	Quantitative
17	Subramaniam & Muniandy	2019	The effect of flipped classroom on students' engagement	/	/	Malaysia	Pre-university	Quantitative
18	Garcia-Ponce & Mora-Pablo	2020	Challenges of using a blended learning approach: A flipped classroom in an English teacher education program in Mexico	/	/	Mexico	University	Qualitative
19	Youhasan et al.	2020	Development and validation of a measurement scale to assess nursing students' readiness for the flipped classroom in Sri Lanka	/	/	Sri Lanka	University	-
20	Juhary	2019	Perceptions of students: Blended learning for IR4.0	/	/	Malaysia	University	Quantitative & Qualitative
21	Tomas et al.	2019	Are first year students ready for a flipped classroom? A case for a flipped learning continuum.	/	/	Australia	University	Quantitative & Qualitative

Note: FC = Flipped classroom; Ready = Readiness; Pre-U = Matriculation/ pre-university/ foundation

The articles mentioned above were retrieved from the Scopus database to investigate the extent of current research on the flipped classroom. Excluded from the selection were studies completed prior to year 2019 that did not undergo the peer review process. Following the selection process, a total of 21 studies pertaining to the flipped classroom model were identified. These studies demonstrate a wide range of geographic distribution globally. A total of 12 studies (57.1%) were conducted in Malaysia, with one study originating from each of the following countries: Taiwan, Netherlands, Mexico, Australia, Sri Lanka, Brunei and China. Additionally, another two studies were carried out in Turkey. Then, as per the research methodology, 10 out of 21 (47.6%) of the articles use a quantitative research strategy, one study (4.8%) employs a qualitative research approach to gain a broader perspective of the flipped classroom, and 9 studies (42.9%) utilize a mixed-method approach.

The main finding from the above studies indicates that a substantial proportion, that is, 14 out of 21 (66.7%), primarily concentrate on higher education whereas only one study (4.8%) looks into pre-university or matriculation level with 9 out of 21 studies (42.8%) focused on examining the readiness for the flipped classroom approach. Hence, this reveals a research gap that necessitates an investigation into the level of readiness towards implementing the flipped classroom approach in matriculation institution. The study of the readiness of matriculation students and teachers in domains such as pedagogical training, technological efficacy and attitudes has the potential to help in identifying the challenges and needs of both groups, thereby offering a thorough comprehension of the current situation. This will support the development of focused interventions and policies for the successful adoption of flipped classroom.

The following are some literature reviews on the selected articles. Firstly, Subramaniam & Muniandy (2019) highlighted the dearth of research on the flipped classroom approach in Malaysian pre-university programs. Consequently, a study was done to examine the influence of the flipped classroom on the levels of student engagement in a computer science course for pre-university students. The flipped classroom and the didactic classroom did not significantly differ in terms of student engagement, despite the fact that the results indicated that the students in the flipped classroom were highly engaged. Another finding from the study uncovers that some students prefer viewing videos before attending class and participating in classroom activities, whilst others find conventional methods of learning to be more beneficial. Therefore, examining variables influencing students' readiness for flipped classroom might offer valuable insights into the elements that contribute to students' varying level of receptiveness towards this pedagogical approach.

A closer look on the scope of student readiness reveals that some students have low readiness level for flipped classroom due to lack of motivation (Garcia-Ponce & Mora-Pablo, 2020; Polat et al., 2022) or lack of self-discipline to study the materials before class. Additionally, students will also be less prepared to engage in flipped classroom if they find it challenging to manage time to balance workload and academic assignments with extracurricular activities (Chan et al., 2020; Shaari et al., 2021). Students who are not motivated or are insufficiently prepared to adopt the flipped classroom approach will resist this groundbreaking approach of teaching. Thus, doing research on the readiness for the flipped classroom is crucial, as the failure to acknowledge the readiness of both teachers and students would impede the successful implementation of this method of instruction.

Next, according to study by Velde et al. (2021), first-year students are typically less “ready” for the flipped classroom than older students are, and to promote their motivation in a flipped classroom setting, they might need more structured guidance and clear expectations. Similar results from another study by Tomas et al. (2019) shows that first-year students are not fully ready for flipped learning as third-year students are. According to their survey responses, these first-year students admitted they were not used to being in charge of their own learning and were not fond of active learning. In order to prepare them for the student-centered approach of flipped classroom, it may be necessary to gradually introduce flipped learning to students and provide them with support in developing skills concerning self-directed learning. Since matriculation serves as the gateway to undergraduate study, it is crucial to investigate the readiness of matriculation students for flipped classroom, as this will affect their level of confidence with this instructional approach upon commencing with their bachelor’s degree. This aligns with the existing research gap that suggests the significance for conducting a study at the matriculation level.

The aforementioned studies have shown certain research gaps, one of which concerns an urgent need for further research on teachers’ and students’ readiness for flipped classroom in matriculation education settings by examining different elements affecting readiness level. Addressing this research gap will enhance our knowledge of the effective implementation of the flipped classroom, which is a worthwhile student-centered approach in today’s technological age.

Conclusion

This study has reviewed the existing literature on the model of flipped classroom, explored its implementation in Malaysia, and examined the readiness of students as well as teachers for this instructional approach. Further studies are needed to explore various dimensions determining the readiness of students and teachers, and to investigate potential implication of readiness level towards successful execution of flipped classroom. The review additionally draws attention to the scarcity of research of flipped classroom at the matriculation or pre-university level. For instance, Wut et al. (2022) who carried out a study on university students, propose that further investigation should be conducted to investigate the efficacy of the flipped classroom approach in different levels of education. In conclusion, this paper provides a thorough examination of the current research on flipped classrooms in different contexts, with a particular emphasis on readiness to implement flipped classroom in matriculation. The insights gained highlights how crucial it is to investigate at teachers’ and students’ readiness level for the purpose of creating meaningful and successful flipped classroom.

References

- Afzali, Z., & Izadpanah, S. (2021). The effect of the flipped classroom model on Iranian English foreign language learners: Engagement and motivation in English language grammar. *Cogent Education*, 8(1), 1870801.
- Agirman, N., & Ercoskun, M. H. (2022). History of the flipped classroom model and uses of the flipped classroom concept. *International Journal of Curriculum and Instructional Studies*, 12(1), 78-88.
- Agyei, C., & Razi, Ö. (2022). The effect of extended UTAUT model on EFLs’ adaptation to flipped classroom. *Education and Information Technologies*, 27(2), 1865-1882.

- Ahmad Narihan, M. Z., Awang Ojep, D. N., Ahadon, M., Aye, T. T., Shii, L. L., & Razali, S. A. (2023). Time to Flip? Feedback from UNIMAS medical students towards implementation of flipped pathology classroom. *Education in Medicine Journal*, 15(1).
- Ahmad, D., & Arifin, M. A. (2021). Exploring student achievement and perceptions in an online flipped grammar course. *Indonesian Journal of Applied Linguistics*, 10(3).
- Ali, H. M. H. H. M., Asamoah, D., & Shahrill, M. (2022). Effectiveness of flipped classroom model through multimedia technology in improving students' performance in directed numbers. *Infinity Journal*, 11(2), 193-210.
- Atwa, Z., Sulayeh, Y., Abdelhadi, A., Jazar, H. A., & Eriqat, S. (2022). Flipped classroom effects on grade 9 students' critical thinking skills, psychological stress, and academic achievement. *International Journal of Instruction*, 15(2), 737-750.
- Basriyah, K., Sulisworo, D., Maruto, G., Toifur, M., & Abd Rahman, N. H. (2020). Effects of the flipped classroom on understanding the thermodynamic concept at high school students. *Universal Journal of Educational Research*, 8(3B), 51-58.
- Bawaneh, A. K., & Moumene, A. B. H. (2020). Flipping the classroom for optimizing undergraduate students' motivation and understanding of medical physics concepts. *EURASIA Journal of Mathematics, Science and Technology Education*, 16(11).
- Bishnoi, M. M. (2020). Flipped classroom and digitization: an inductive study on the learning framework for 21st century skill acquisition. *JETT*, 11(1), 30-45.
- Botella, Á. G., García Martínez, S., Molina García, N., Olaya Cuartero, J., & Ferriz Valero, A. (2021). Flipped learning to improve students' motivation in physical education. *Acta Gymnica*, 51. <https://doi.org/10.5507/ag.2021.012>
- Chan, S. Y., Lam, Y. K., & Ng, T. F. (2020). Student's perception on initial experience of flipped classroom in pharmacy education: Are we ready?. *Innovations in Education and Teaching International*, 57(1), 62-73. <https://doi.org/10.1080/14703297.2018.1541189>
- Chou, C. L., Hung, M. L., Tsai, C. W., & Chang, Y. C. (2020). Developing and validating a scale for measuring teachers' readiness for flipped classrooms in junior high schools. *British Journal of Educational Technology*, 51(4), 1420-1435.
- Cilliers, E. J. (2017). The challenge of teaching generation Z. *PEOPLE International Journal of Social Sciences*.
- Darmawan, I. D. M. B. A., Wirastuti, N. M. A. E. D., Nilakusmawati, D. P. E., & Raharja, M. A. (2021). The effectiveness of the blended learning approach in algorithm and programming courses. *Journal of Physics: Conference Series*, 1722(1).
- Deng, F. (2019). Literature review of the flipped classroom. *Theory and Practice in Language Studies*, 9(10), 1350-1356.
- Divjak, B., Rienties, B., Iniesto, F., Vondra, P., & Žižak, M. (2022). Flipped classrooms in higher education during the COVID-19 pandemic: Findings and future research recommendations. *International Journal of Educational Technology in Higher Education*, 19(1), 1-24.
- Durak, H. Y. (2020). Modeling different variables in learning basic concepts of programming in flipped classrooms. *Journal of Educational Computing Research*, 58(1), 160-199.
- Fox, W. H., & Docherty, P. D. (2019). Student perspectives of independent and collaborative learning in a flipped foundational engineering course. *Australasian Journal of Educational Technology*, 35(5), 79-94.

- Fructuoso, I. N., Albó, L., & Beardsley, M. (2022). University students' preference for flexible teaching models that foster constructivist learning practices. *Australasian Journal of Educational Technology*, 38(4), 22-39.
- Garcia-Ponce, E. E., & Mora-Pablo, I. (2020). Challenges of using a blended learning approach: A flipped classroom in an English teacher education program in Mexico. *Higher Learning Research Communications*, 10(2), 6.
- Halili, S. H., Mohsin, N., & Razak, R. A. (2021). Student perceptions towards the use of the mobile flipped classroom approach. *International Journal of Web-Based Learning and Teaching Technologies (IJWLTT)*, 16(6), 1-13.
- Hashim, N. A., & Shaari, N. D. (2020). Malaysian teachers' perception and challenges towards the implementation of flipped learning approach. *Asian People Journal (APJ)*, 3(2), 62-76.
- Juhary, J. (2019). Perceptions of students: Blended learning for IR4.0. *International Journal of Information and Education Technology*, 9(12), 887-892.
- Kamarzaman, I. H., Yahaya, R., & Yusof, R. (2021). The effect of flipped instructional plan on student performance. *International Journal of Academic Research in Business and Social Sciences*, 11(10), 487-497.
- Kazu, İ. Y., & Kurtoglu, C. (2020). Research of flipped classroom based on students' perceptions. *Asian Journal of Education and Training*, 6(3), 505-513.
- Kazu, I. Y., & Yalçın, C. K. (2022). The relationship between secondary school teachers and students' readiness of using flipped classroom. *Journal on Efficiency and Responsibility in Education and Science*, 15(1), 1-9.
- Kiang, N. H., & Yunus, M. M. (2021). What do Malaysian ESL teachers think about flipped classroom?. *International Journal of Learning, Teaching and Educational Research*, 20(3), 117-131.
- Lim, A. H., Mohd Nawawi, A. A., Choo, H. N., Zainul Abidin, N. A., & Kamilin, M. H. (2023). Self-directed learning mathematics with V-Mindmap. In: *International Teaching Aid Competition 2023*. Universiti Teknologi MARA, Kedah, pp. 184-194. ISBN 9789672948513
- Mahat, H., Bahri, S. A. S., Hashim, M., Nayan, N., & Saleh, Y. (2021). Pengetahuan, kesediaan dan penggunaan flipped classroom dalam kalangan pelajar pendidikan Geografi UPSI. *Sains Humanika*, 13(2).
- Malek, N. A., Abdullah, N. S. Y., Mat Darus, M., & Nursulistiyo, E. (2022). A need analysis for the development of Physics game-based interactive module in matriculation college. *EDUCATUM Journal of Science, Mathematics and Technology*, 9, 48-60. <https://doi.org/10.37134/ejsmt.vol9.sp.6.2022>
- Meliani, F., Muhyiddin, D. S., Ruswandi, U., Arifin, B. S., & Suzana, S. (2022). Challenges of using technology in Islamic religious education learning (Application of flipped-classroom in Class X PAI subjects at SMA Plus Pagelaran Subang). *Edukasi Islami: Jurnal Pendidikan Islam*, 11(001), 41-57.
- Mojtahedi, M., Kamardeen, I., Rahmat, H., & Ryan, C. (2020). Flipped classroom model for enhancing student learning in construction education. *Journal of civil engineering education*, 146(2), 05019001.
- Nantha, C. (2022). A quasi-experimental evaluation of classes using traditional methods, problem-based learning, and flipped learning to enhance Thai student-teacher problem-solving skills and academic achievement. *International Journal of Emerging Technologies in Learning (Online)*, 17(14), 20.

- Ölmefors, O., & Scheffel, J. (2023). High school student perspectives on flipped classroom learning. *Pedagogy, Culture & Society*, 31(4), 707-724.
- Parati, T., Said, M. N. H. M., & Hanid, M. F. A. (2023). Assessing the effects of flipped classroom to the primary pupils' English learning performance. *International Journal of Learning, Teaching and Educational Research*, 22(10), 1-17.
- Polat, E., Hopcan, S., & Arslantaş, T. K. (2022). The association between flipped learning readiness, engagement, social anxiety, and achievement in online flipped classrooms: a structural equational modeling. *Education and Information Technologies*, 27(8), 11781-11806.
- Reddy, A. J., Khera, M. K., McLaughlin, J., & Szabo, C. Z. 2021. The role of motivation in incidental vocabulary learning through academic videos. *Asia Pacific Journal of Educators and Education*, 36(1), 135–153. <https://doi.org/10.21315/apjee2021.36.1.8>
- Røe, Y., Rowe, M., Ødegaard, N. B., Sylliaas, H., & Dahl-Michelsen, T. (2019). Learning with technology in physiotherapy education: design, implementation and evaluation of a flipped classroom teaching approach. *BMC medical education*, 19, 1-8.
- 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.
- Shaari, N. D., Shaari, A. H., & Abdullah, M. R. (2021). Investigating the impact of flipped classroom on dual language learners' perceptions and grammatical performance. *Studies in English Language and Education*, 8(2), 690-709.
- Soon Tan, C., Zakuan, N., & Ismail Abd Aziz, M. (2022). Recent trends of blended learning and flipped classroom in Malaysia. *Arab World English Journal (AWEJ) 2nd Special Issue on Covid*, 19.
- Sosa Díaz, M. J., Guerra Antequera, J., & Cerezo Pizarro, M. (2021). Flipped classroom in the context of higher education: Learning, satisfaction and interaction. *Education Sciences*, 11(8), 416.
- Subramaniam, S. R., & Muniandy, B. (2019). The effect of flipped classroom on students' engagement. *Technology, Knowledge and Learning*, 24(3), 355-372.
- Sulong, A., Ibrahim, A. B., & Abas, A. (2020). Gamyflip-pro module: teaching and learning through flipped classroom and gamification approach. *The 9th International Innovation, Invention and Design Competition 2020*, 215-218.
- Techanamurthy, U., Alias, N., & Dewitt, D. (2020). A problem-solving flipped classroom module: Developing problem-solving skills among culinary arts students. *Journal of Technical Education and Training*, 12(4), 39-47.
- Tomas, L., Evans, N. S., Doyle, T., & Skamp, K. (2019). Are first year students ready for a flipped classroom? A case for a flipped learning continuum. *International Journal of Educational Technology in Higher Education*, 16(1), 1-22.
- Velde, R. V. D., Blignaut-van Westrheden, N., Labrie, N. H., & Zweekhorst, M. B. (2021). 'The idea is nice... but not for me': First-year students' readiness for large-scale 'flipped lectures'—what (de) motivates them?. *Higher Education*, 81(6), 1157-1175.
- Wanner, T., & Palmer, E.K. (2015). Personalising learning: Exploring student and teacher perceptions about flexible learning and assessment in a flipped university course. *Comput. Educ.*, 88, 354-369.
- Wut, T. M., Xu, J., Lee, S. W., & Lee, D. (2022). University student readiness and its effect on intention to participate in the flipped classroom setting of hybrid learning. *Education Sciences*, 12(7), 442.

- Xu, Z., & Shi, Y. (2018). Application of constructivist theory in flipped classroom-take college English teaching as a case study. *Theory and Practice in Language Studies, 8*(7), 880-887.
- Youhasan, P., Chen, Y., Lyndon, M., & Henning, M. A. (2020). Development and validation of a measurement scale to assess nursing students' readiness for the flipped classroom in Sri Lanka. *J Educ Eval Health Prof, 17*(17), 41.
- Zakaria, S., & Yunus, M. M. (2020). Flipped classroom in improving ESL primary students' tenses learning. *International Journal of English Language and Literature Studies, 9*(3), 151-160.
- Zhao, L., Liu, X., & Su, Y. S. (2021). The differentiate effect of self-efficacy, motivation, and satisfaction on pre-service teacher students' learning achievement in a flipped classroom: A case of a modern educational technology course. *Sustainability, 13*(5), 2888.
- Zhao, X., & Yang, Y. (2023). Impact of social media-supported flipped classroom on English as a foreign language learners' writing performance and anxiety. *Frontiers in Psychology, 13*, 1052737.