




## CRITICAL REVIEW ON FLIPPED CLASSROOM MODEL VERSUS TRADITIONAL LECTURE METHOD

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### ABSTRACT

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#### Keywords

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Flipped classroom model is now a well-established learning approach which has brought a paradigm shift by blending technology with the traditional method of teaching. The real meaning of Flipped classroom model is that the traditional lecture method is flipped so that learners get the initial learning material at home and class time is used for cooperative learning. The tools used for the flipped classroom model include Learning management system, social media and like. A lot of research studies exist on Flipped classroom model but these studies lack a unified approach over its significance. If one set of studies ranks Flipped classroom model better than the traditional lecture method; the other instruction models consider its success due to its integration with technology. There are also studies that associate Flipped classroom model with student-centered approach especially in university education. This article reviews a few of these studies with the objective to understand this debate about the right method of learning; and to identify which studies acknowledge the significance of Flipped classroom model. A set of 33 articles published from 2012 to 2020 were selected for this study. The statistical results show a mixed reaction about the acceptability and adaptability of the Flipped classroom model in the modern learning environment.

**Contribution/Originality:** This study makes a critical review of 33 studies on Flipped classroom model with the view to understand how the previous studies have acknowledged the importance, adaptability and of flipped classroom model in the modern learning environments and also how they differentiated this model from the Traditional Lecture Method.

## 1. INTRODUCTION

Learning is an essential element of humankind and crucial for the development of a nation (Hafeez et al., 2020). Buckman et al. (2010) stated that there are four important strategies for active learning (1) create individual activities in and out of the classroom (2) integrate students in group activities (3) inspire informal group, and (4) assign project tasks to cooperative students. Engaging these concepts with “Flipped classroom model” involves students to take part in the learning process with full concentration. This model enables students to learn more cooperatively and think critically. It also allows students to share their knowledge with peers (Michel, Cater III, & Varela, 2009). The Flipped classroom model improves the efficacy of learning and increases the motivation level of

students to learn actively (Lewis, Chen, & Relan, 2018). The Flipped classroom model of instruction was established by Bergmann and Sams (2012) to deliver lecture to students of secondary schools who had not taken all the classes. In the Flipped classroom instruction model, work is done by the students prior to a class. The Bloom's taxonomy related to traditional and flipped learning approaches is shown in Figure 1.

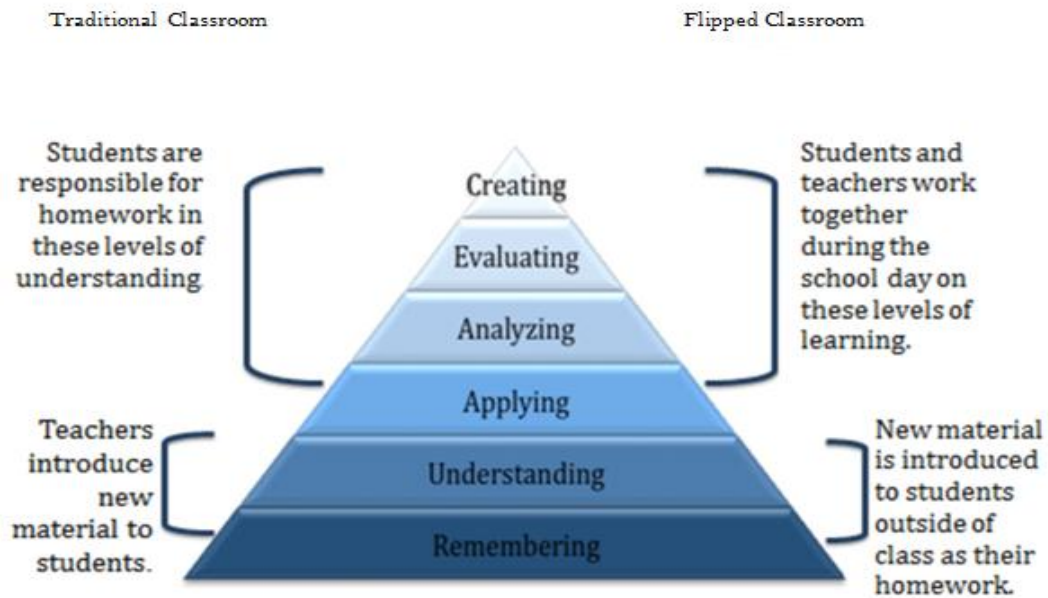


Figure-1. Bloom's taxonomy related to traditional and flipped learning approaches.

The researches indicate that in Flipped classroom model of instruction, the learners actively participate and achieve better conceptual learning as compared to other traditional lecture methods (Sezer, 2010). Roehl, Reddy, and Shannon (2013) stated the Flipped classroom instruction model can be easily integrated with technology before the class and the class time can be used for active and cooperative learning. The Flipped classroom model also applies student-centered approach for learning process (Abeysekera & Dawson, 2015). Flipped classroom model is getting more attention in educational activities specially in university education (Toppo, 2011). In Flipped classroom model, the traditional lecture method is flipped so that learners get the initial learning material at home and class time is used for cooperative learning. The tools used for the flipped classroom model include Learning management system, YouTube, WhatsApp (Pohl, Bouchachia, & Hellwagner, 2018).

### 1.1. Flipped Classroom Learning or Blended Learning

Graham, Woodfield, and Harrison (2013) suggested that in blended learning, face to face and computer-based instructions are mixed. The Flipped classroom model of learning is based on online video and audio lectures provided out of the class and the problem-solving discussion sessions are conducted in the classroom. The blended learning is type of learning in which mixed teaching strategy (traditional and information technology) is provided to learners. The blended learning is therefore also called Flipped classroom model of learning (Staker & Horn, 2012).

The comparison between the traditional classroom and Flipped classroom in achieving higher order thinking skills in Blooms Taxonomy is stated in Table 1. There are three levels of learning in traditional lecture and flipped classroom model of instruction. For remembering learning level, face to face learning happens in traditional classroom while pre-recorded lecture and videos are used for the learning process. For understanding learning level, Question and answer tools are used in traditional classroom and peer to peer discussion tools are used in flipped classroom for understanding learning level. For analyzing understanding level of learning, homework tool is used in traditional lecture classroom while in flipped classroom, projects and presentation tools are used.

**Table-1.** Comparison of traditional and flipped classroom in blooms taxonomy.

Level of Learning	Traditional Classroom Tools	Flipped Classroom Tools
Remembering	Face to face lecture	Pre-recorded lectures, reading material and watching video lectures independently
Understanding	Question and answer	Reflection, Peer-to-peer discussion and collaboration
Analyzing	Homework	Classroom activities such as group discussion
Applying, Evaluating, Creating	Homework or nothing	Student projects, presentations and instructor evaluation

Table 2 shows that how traditional and Flipped classroom instructional methods are demonstrated according to the classroom time management stated by Bergmann and Sams (2012). The classroom activities in both traditional and flipped classroom models of instruction are distributed in various time steps. In traditional lecture method, the warm up activity is done for 5 minutes, previous homework is revised for 20 minutes, the new content is delivered for 30-45 minutes and Guided and independent practice and active learning is done for 20-35 minutes. In Flipped Classroom model of Instruction, the warm up activity is done for 5 minutes, Questions and Answering on video lecture is performed for 10 minutes and Guided and independent practice and active learning is done for 75 minutes.

**Table-2.** Traditional and Flipped Classroom activities based on Bergmann and Sams, (2012).

Traditional classroom		Flipped classroom	
Activity	Time (min)	Activity	Time (min)
Activity to warm up	5	Activity to warm up	5
Go through for previous work	20	Questions and Answers on video lectures	10
New content lecture	30-45	Active learning and independent practice	75
Active learning and independent practice	20-35		

Bishop and Verleger (2013) suggested that the interaction with teacher during learning process is less significant during instructions as compared to real life problem solving based, discussion based, and inquiry-based learning. The Flipped Classroom instruction method exploits on this peculiarity.

### 1.2. Significance of Flipped Classroom as an Active Learning Approach

The effectiveness of Flipped classroom model of instruction has been proved in many studies as an active learning strategy (Kim, Jin, & Lim, 2015; Park & Park, 2018; Wilson, 2020).

These studies have discussed flipped classroom as an important part of the paradigm shift from teacher-centered to student-centered learning, in which teachers move the knowledge delivery outside of formal class time. In formal class time, students actively and extensively interact with teachers and peers through collaborative work such as “whole-class brainstorming, group-based hands-on assignments and peer-review, feedback exchange and remedial help” (Missildine, Fountain, Summers, & Gosselin, 2013).

The Flipped Classroom model of instruction highlights the priority of Problems-Solving method over the lecture or traditional teaching method in a classroom. The learning approaches like project-based learning, student-centered learning, problem-based learning and inquiry-based learning emphasize on students to participate actively in the learning process. Most of these learning approaches use Flipped classroom model of instruction (Grant, 2013; Keengwe & Bhargava, 2014).

### 1.3. Purpose of This Study

A lot of studies have been conducted on the evaluation of the effectiveness of Flipped classroom model of instruction and traditional lecture method, but there is still little unanimity and consensus regarding the most

effective methods. The results of previous studies are divergent. There have been many studies including (Bernard, 2015; Chen et al., 2018; Gillette et al., 2018; Hew & Lo, 2018; Miles & Fogget, 2016) which examine Flipped Classroom model as more effective, less effective or making no significance differences. The purpose of current study therefore was to review the previous literature about flipped classroom model and traditional lecture method and to compare the results statistically.

## 2. REVIEW OF LITERATURE

It has been a practice that instructors use the traditional lecture method in their classrooms and students follow up lecture with homework (Abedi, Keshmirshakan, & Namaziandost, 2019). The traditional lecture method makes learners passive in getting knowledge as compared to Flipped classroom model as it makes creators. Knowledge becomes viable when there is dynamic participation in the learning process and communications happen between the components of learning practice (Abedi et al., 2019).

Many researchers including (Ash, 2012; Shakibaei, Namaziandost, & Shahamat, 2019) stated that a lot of instructors have moved away from traditional lecture methods. In traditional learning method, the learners are required to just submissively attend and listen to teacher's lecture and then gather facts from the notes. This method of teaching has been exposed to be unproductive for learners in present era (Abedi et al., 2019; Brunzell & Horejsi, 2013). Positive results have been stated by those teachers who have assimilated the Flipped classroom model. The Learners were noted to be more active solving the real-life problems (Lai & Hwang, 2016; Roach, 2014). It is stated that students were involved in self-learning procedure in Flipped classrooms model (Sohrabi & Iraj, 2016).

Hew and Lo (2018) conducted 28 revisions equating the flipped classrooms model of instruction to the traditional method of teaching in Nursing. The statistical results show that Flipped classroom model has a 0.33% more significant value than the traditional lecture-based classroom.

Chen et al. (2018) reviewed 46 empirical researches in the field of non-health and health contexts. Their conclusion was that Flipped classroom model has a 0.47% more significant value than traditional lecture based classroom.

Gillette et al. (2018) acknowledged five revisions in the perspective of medicinal education and concluded that there is no significant relation between the flipped classrooms model of instruction and traditional lecture method on last examination grades.

### 2.1. Flipped Classroom Model of Instruction and Students' Academic Achievements

In current era, several researches have concentrated on the influences of flipped classrooms model of learning on academic achievements of learners.

Zengin (2017) conducted a research to create Flipped classroom learning environment in Khan Academy and by using an open source mathematical software. The objectives of this research were to inspect the impacts of flipped classrooms model of instruction on academic achievements of students and expose the opinions about the application of flipped classrooms model of instruction. There were 28 participants in research in the subject of Mathematics. The conclusions of the study showed that the flipped classrooms model environment created by Mathematical software and Khan Academy increased students' academic achievements two times more than that of the traditional lecture method.

Zhonggen and Guifang (2016) directed an investigation to explore the efficiency of Flipped classrooms model on English reading and writing courses by using mix method approach. The data was collected on the bases of satisfaction, a test on Business English course and interview. The results of the study showed that members used flipped classrooms model and scored higher grades than the members taught by traditional lecture method. To demonstrate the efficiency of the flipped classroom Model of learning, Janotha (2016) inspected the level to which

flipped classrooms model affected students' academic achievements in a nursing program. The consequences of the revision exposed that the learners who were taught with Flipped classrooms model scored higher grades as compared to the students taught by traditional lecture method.

A qualitative study about flipped classroom model and traditional lecture method was conducted by O'Flaherty and Phillips (2015). The video lectures were used for the flipped classroom learning process. The results of the study concluded that in flipped classroom model learning strategy, the students achieved higher grades and actively participated in the learning process as compared to the traditional learning method.

The results of the studies reviewed in this study are illustrated in Table 3 and 4.

Table-3. Results of studies reviewed in this article.

Reference	Class	Subject	Outcomes
Pierce, Fox, and Dunn (2012)	Undergraduate	Pharmacotherapy	Flipped classroom model proved better performance than traditional lecture method.
Tune, Sturek, and Basile (2013)	First-year graduate	Cardiovascular, Respiratory and Renal Physiology	The students scored higher results by Flipped classroom model of instruction as compared to the traditional lecture method.
Cabi (2018)	Pre-service Teachers	Computer course	No significant difference has been found in the scores taught by flipped classroom model of instruction and traditional lecture method.
Keengwe (2014)	11 Grade	Advanced English language course	The flipped classroom model of instruction showed more performance as compared to the traditional lecture method.
Overmyer (2014)	College students	Algebra course	No statistically significance difference in the scores of students have been found in two groups followed the flipped classroom model and traditional lecture method but the students learnt by flipped classroom model of instruction got slightly better scores.
Aidinopoulou and Sampson (2017)	Primary school students	History course	The conclusion of the study showed that Flipped classroom instructional model has slightly more learning outcomes than the traditional learning strategy.
Smallhorn (2017)	Second year college students	Genetics and Biodiversity course	The conclusion of the study indicated that the students actively participated in the learning activities by Flipped classroom model of instruction.
Kostaris, Stylianos, Sampson, Giannakos, and Pelliccione (2017)	K-12	ICT Studies	The learners performed better in flipped classroom learning strategy. The study also proved that amalgamation of Flipped classroom model in teaching-learning process produced significant increase in cognitive ability of the students.
Olakanmi (2017)	Secondary school students	Chemistry	The findings of the study revealed that the flipped classroom model produced better results in teaching learning strategy. The students actively participate in flipped classroom strategy as compared to the traditional method of learning.
Nouri (2016)	Last year undergraduate students	Course in research methods	The conclusion of the study showed that the most of the students had positive effect towards Flipped classroom model of instruction.
Morgan et al. (2015)	Undergraduate medical student	Gynecology oncology	The results of the study indicated that incorporation of flipped classroom model has significantly increased the student's engagement and achievement.
Ayçiçek and Yanpar Yelken (2018)	Secondary school students	English	The study concluded that a statistical significant difference had been observed in Pre-test and Post-test scores of experimental group and significant difference had been observed in Pre-test and Post-test scores of control group.



Ahmad (2016)	3rd-Year undergraduate students	English as a Foreign Language	It is concluded that the Flipped classroom model of instruction has statistical significant impact on listening ability in comprehensive study.
Namaziando st and Cakmak (2020)	Intermediate class	English	The results of the study indicated that the experimental group performed better that was followed by Flipped classroom model of instruction.
Lee and Lai (2017)	secondary school students	ICT course	The results of the research indicated that by incorporating technology like Flipped classroom model of instruction in the learning process, it is possible to increase the learning abilities of students and higher order thinking skills.
Gillispie (2016)	Undergraduate students	obstetrics and gynecology courses	The students taught by Flipped classroom model of instruction scored better performance as compared to the traditional lecture method.
Baytiyeh (2017)	Engineering students	Dynamics of Structures course	The conclusion of the study confirmed the previous results about the Flipped classroom model and traditional lecture method that Flipped classroom is better than the traditional lecture method.
Afrilyasanti, Cahyono, and Astuti (2016)	secondary school students	EFL	The Flipped classroom model has significant effect on the performance of the learners.
Alsancak Sirakaya and Ozdemir (2018)	Undergraduate students	Scientific Research Methods" course	The Flipped classroom model produced significance difference in student's engagement, academic achievement and participation as compared to the traditional lecture method.
Nielsen, Bean, and Larsen (2018)	Undergraduate students	Statistics Course	The outcomes showed a statistically significant enhancement in the students' academic performance and courses satisfaction with Flipped classroom model.
Li and Suwanthep (2017)	First year students	English	The results of the study concluded that Flipped classroom model had increased the students' academic and comprehension skills as compared to the traditional lecture method.
Aşıksoy and Özdamlı (2016)	Undergraduate students	physics course	The students in experimental group learnt by Flipped classroom model had performed better as compared to the control group learnt by traditional lecture method.
Esperanza, Fabian, and Toto (2016)	High school student	Algebra Mathematics	Flipped classroom model produced significant results.
Tsai, Shen, and Lu (2015)	elementary school students	Production of E-book course	It is resulted that the impact of Flipped classroom model on students learning abilities was statistically significant than the traditional lecture method.
Turan and Goktas (2016)	first-year students	computer	The results of the study concluded that the courses taught with Flipped classroom model of instruction had better academic achievements as compared to the traditional lecture method. The flipped classroom model had also improved the cognitive ability of the learners.
Bhagat, Chang, and Chang (2016)	high-school students	trigonometry	The conclusion of the research indicated that there was a significant difference in the students' academic achievement and motivation. The learners learnt by Flipped classroom model achieved better results as compared to the traditional lecture method.
Bachelor (2017)	K-12	SPAN 101 course	On the basis of results, there were no significant differences found between flipped classroom model and traditional lecture method.

Shiau et al. (2018)	Masters-level students	Epidemiology	No significant differences were found in the scores by Flipped classroom model and traditional lecture method.
Alsowat (2016)	Graduate students	English	The results of the research revealed that there was a significant difference between two groups taught by Flipped classroom model and traditional lecture method. The flipped classroom model also increased the higher order thinking skills of learners.
Kurt (2017)	College students	classroom management course	Conclusions showed a higher level of thinking skills by Flipped classroom model as compared to the traditional lecture method.
Perera and de Silva (2017)	Undergraduates students	Clinical Microbiology	The results of the study indicated that Flipped classroom model was proved better than the traditional lecture method.
Kazanidis, Pellas, Fotaris, and Tsinakos (2019)	Undergraduate students	Media Design subjects	The study findings indicated that the students in the experimental group performed significantly better.

Table-4. Statistical Results of the Studies Reviewed in this Article at a Significance level of 0.05.

Reference	Method	Mean	SD	p	Remarks
Pierce et al. (2012)	Traditional	77.7	4.7	0.024	Significant
	Flipped	81.6	4.4		
Tune et al. (2013)	Traditional	64	3.67	0.002	Significant
	Flipped	68	3.47		
Cabı (2018)	Traditional	56.64	1.42	0.478	Non-Significant
	Flipped	55.29	1.61		
Keengwe (2014)	Traditional	2.80	1.00	0.035	Significant
	Flipped	M=3.59	0.98		
Overmyer (2014)	Traditional	21.27	5.130	0.057	Non-Significant
	Flipped	20.14	5.101		
Aidinopoulou and Sampson (2017)	Traditional	8.72	1.401	0.690	Non-significant
	Flipped	8.95	1.250		
Smallhorn (2017)	Traditional	58.52	19.96	0.864	Non-Significant
	Flipped	58.25	21.45		
Kostaris et al. (2017)	Traditional	15.825	1.827	0.0146	Significant
	Flipped	17.125	1.440		
Olanmi (2017)	Traditional	1.41	3.68	0.04	Significant
	Flipped	5.70	3.58		
Nouri (2016)	Traditional	3.194	1.134	0.023	Significant
	Flipped	3.409	1.118		
Morgan et al. (2015)	Traditional	3.39	0.676	0.03	Significant
	Flipped	3.624	0.564		
Ayçiçek and Yanpar Yelken (2018)	Traditional	13.77	5.83	0.022	Significant
	Flipped	15.28	5.57		
Ahmad (2016)	Traditional	8.235	4.143	0.025	Significant
	Flipped	7.559	3.886		
Namaziandost and Cakmak (2020)	Traditional	23.41	2.984	0.037	Significant
	Flipped	25.43	2.756		
Lee and Lai (2017)	Traditional	3.72	0.827	0.4095	Non-Significant
	Flipped	4.06	0.747		
Gillispie (2016)	Traditional	27.325	4.02	0.4945	Non-Significant
	Flipped	28.65	3.79		
Baytiyeh (2017)	Traditional	77	13.8428	0.02	Significant
	Flipped	79.428	4.9571		
Afrilyasanti et al. (2016)	Traditional	56.8	6.17		

	Flipped	66.495	5.66	0.0089	Significant
Alsancak Sirakaya and Ozdemir (2018)	Traditional	30.8	6.05	0.045	Significant
	Flipped	33.15	5.5		
Nielsen et al. (2018)	Traditional	26.41	4.09	0.0475	Significant
	Flipped	26.74	4.03		
Li and Suwanthep (2017)	Traditional	11.604	2.7335	0.029	Significant
	Flipped	12.3365	2.629		
Aşıksoy and Özdamlı (2016)	Traditional	62.12	2.906	0.011	Significant
	Flipped	74.63	1.949		
Esperanza et al. (2016)	Traditional	6.51	2.67	0.0462	Significant
	Flipped	5.93	2.18		
Tsai et al. (2015)	Traditional	92.79	3.009	0.004	Significant
	Flipped	94.36	2.202		
Turan and Goktas (2016)	Traditional	67.01	2.43	0.0148	Significant
	Flipped	78.90	2.05		
Bhagat et al. (2016)	Traditional	8.966	2.228	0.018	Significant
	Flipped	9.735	1.628		
Bachelor (2017)	Traditional	68.935	26.495	0.567	Non-Significant
	Flipped	64.025	29.695		
Shiau et al. (2018)	Traditional	90.95	9.34	0.385	Non-Significant
	Flipped	92.3	6.475		
Alsowat (2016)	Traditional	7.617	1.95	0.00816	Significant
	Flipped	7.515	1.62		
Kurt (2017)	Traditional	145.935	19.735	0.10	Non-Significant
	Flipped	143.86	24.165		
Perera and de Silva (2017)	Traditional	5.4	2.6	0.0009	Significant
	Flipped	6.85	1.9		
Liebert, Lin, Mazer, Berekyei, and Lau (2016)	Traditional	75.8585	8.045	0.337	Non-Significant
	Flipped	74.881	8.03		
Albalawi (2018)	Traditional	15.345	2.745	0.228	Non-Significant
	Flipped	19.848	1.8765		
Ramadhani, Umam, Abdurrahman, and Syazali (2019)	Traditional	68.1363	7.301	0.0085	Significant
	Flipped	70.22	5.602		
Kazanidis et al. (2019)	Traditional	49.3495	8.34	0.0476	Significant
	Flipped	52.261	8.95		

The effectiveness of flipped classroom model of instruction has been proved by many studies including (Afzali & Izadpanah, 2021; Bhat, Raju, Bhat, & D'Souza, 2020; Enfield, 2013). The application of flipped classroom model of instruction as a substitute to the traditional learning settings has drawn the attention of instructors and researchers (Johnston, 2017). It is even asserted that the flipped classroom model, which is used to create effective teaching environments at schools, is the best model for adapting with technology (Hamdan, McKnight, McKnight, & Arfstrom, 2013). Studies about the flipped classroom appear in different disciplines including information systems (Davies et al., 2014), engineering, sociology, and humanities (Kim, Kim, Khera, & Getman, 2014) mathematics education (Zengin, 2017) and English composition (Zhonggen & Guifang, 2016).

A review study has been conducted to compare the effectiveness of flipped classroom model of instruction and traditional lecture method. The review of literature and statistical results show that in most of the cases, flipped classroom strategy is very useful for the active learning, student's engagement, problem solving and students higher order thinking skills. However, there are number of results in which there was no significant difference between flipped classroom model and traditional lecture method has been found.

### 3. CONCLUSION

A critical comparison of Flipped classroom model and Traditional lecture method has been presented in this study. This comparative review shows that Flipped classroom model is an effective strategy for learning. It



increases the self-efficacy of students in comparison with the Traditional lecture method. The main features of flipped classroom model of instruction presented in the literature are active learning method, group discussion, collaborations and problem-solving method. When statistical results are compared between 33 selected articles, the Flipped classroom model shows more significance value in 22 articles and no significance is found in 11 articles between Flipped classroom model and Traditional lecture method. So, it can be concluded that Flipped classroom model is more effective teaching strategy as related to the Traditional method of teaching.

#### 4. RECOMMENDATIONS

In order to be consistent with the results of most of the literature reviewed in this article, the instructor should follow the flipped classroom learning strategy to achieve the high academic performance.

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