

## Students' cognitive engagement and academic performance in a flipped classroom model in outstanding class program

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### ABSTRAK

Integrasi teknologi sudah mulai mendominasi dunia pendidikan terutama saat COVID-19 melanda dunia. Salah satu mode pembelajaran yang populer pada situasi yang tidak stabil ini adalah flipped classroom dimana materi kelas dikirim lebih awal kepada siswa melalui alat komunikasi seperti WhatsApp atau telegram dan akan dibahas lebih lanjut dalam pertemuan kelas online atau offline. Namun, penelitian tentang flipped classroom terkait kognitif dan kinerja akademik siswa masih terbatas. Oleh karena itu, penelitian ini bertujuan untuk meneliti secara mendalam dampak flipped classroom terhadap keterlibatan kognitif siswa dan kinerja akademik mereka dalam belajar bahasa Inggris khususnya menulis teks deskriptif di program kelas unggulan. Subyek dalam penelitian ini adalah 18 siswa pada salah satu sekolah swasta di wilayah Indonesia timur. Data penelitian dilihat dari observasi dan angket kemudian dianalisis secara kuantitatif. Temuan menunjukkan keterlibatan kognitif siswa masih perlu didorong untuk membuat mereka lebih aktif dan antusias untuk berpartisipasi dalam proses pembelajaran. Sedangkan hasil belajar menunjukkan perubahan yang sedikit meningkat. Kesimpulannya, program flipped classroom pada kelas unggulan dapat berjalan dengan baik jika diimplementasikan secara aktif oleh semua pihak seperti guru, siswa, dan orang tua. Oleh karena itu kami merekomendasikan untuk melakukan penelitian lebih lanjut mengenai masalah flipped classroom dan prestasi belajar untuk memperkaya dunia penelitian pendidikan.

**Kata Kunci:** Kinerja Akademik; Keterlibatan Kognitif; Pembelajaran Bahasa Inggris; Kelas Terbalik.

### ABSTRACT

*Technology integration has begun to stir the education world particularly when COVID-19 hits the world. One of the popular learning modes during this unstable situation is flipped classroom in which class material is sent earlier to students via communication tools like WhatsApp or Telegram and will be discussed more in an online or offline class meeting. However, the implementation of this learning mode still lacks of research in terms of cognitive engagement and academic performance. In light of this issue, this study aims to research deeply the impact of the flipped classroom on students' cognitive engagement and their academic performance in learning English particularly writing descriptive text in an outstanding class program. The subject in this research was 18 students of an outstanding class program in a private school in eastern region of Indonesia. Students learning results, observation and questionnaire were used to gather the data needed and then analyzed quantitatively. The findings showed students' cognitive engagement needs to be encouraged to make them more active and enthusiastic to participate in the learning process. Whilst, the learning result revealed a slight improvement. In conclusion, flipped classroom in an outstanding class program may work well if it is implemented actively by all parties like teachers, students, and parents. We, therefore recommended doing further research on the issue of flipped classroom and learning achievement to enrich the world of education research.*

**Keywords:** Academic Performance; Cognitive Engagement; English Learning; Flipped Classroom.

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## INTRODUCTION

Technology integration in the education world cannot be aside for its main contribution as part of learning, particularly when an unstable condition such as the time of COVID-19. The Indonesian government has provided scenarios in facing the challenge of the education world in unstable conditions, including encouraging online learning for students. Here, flipped classroom in online mode is the chosen learning mode in most Indonesian schools at this time. Even though, we are now in post-COVID time and the learning seems back to normal, the way of learning in some schools still is diverse. Some schools have applied for offline meetings; full face-to-face meeting, others implemented limited meeting access which the full-day school is done in three days or more in a week, and a few schools still conducted on online-based learning. The modes of learning in these schools are various but similar in the technology integration in the learning. Flipped classroom still dominates the learning mode either on-site classroom meeting or on online-based learning.

The flipped classroom is a pedagogical model which maximized the use of digital resources in learning outside the classroom. The flipped classroom concept focuses on activating students centered learning with related content (Ruiz-Jiménez et al., 2022). The original concept of the flipped classroom is an inverted classroom model in which the learning materials are introduced before the class time, and discussed to deepen for understanding with peers and teacher in the classroom (Goedhart et al., 2019; Hardin & Koppenhaver, 2016; Saichaie, 2020). The prior learning materials which are sent to students can be in the form of prerecorded teaching, interactive videos, simulation and cases, prescribed reading, and other learning materials (Goedhart et al., 2019; Hardin & Koppenhaver, 2016; Saichaie, 2020; Wolff & Chan, 2016). Thus, the students will try to build on their knowledge by comprehending the given material. Here, the students are pushed to activate their critical thinking by analyzing the learning materials (Gilboy et al., 2015). Also, they are forced to have self-regulated learning and be autonomous learner. Besides that, to perceive the good of flipped classroom, the students are hoped to be an active learner during the learning process (Wang et al., 2022).

Flipped classroom brings positive effects in learning for some cases (Durrani et al., 2022; Förster et al., 2022; Lee et al., 2022; Nja et al., 2022; Phillips & Wiesbauer, 2022; Senali et al., 2022; Wang et al., 2022). Many studies have mentioned the positive engagement of flipped classroom include facilitating students with best video education that support the work of flipped classroom (Phillips & Wiesbauer, 2022), highly adjustable to classroom cultures (Lee et al., 2022), evaluating learner's learning style before implementing it that makes the learning suits to the students' need (Wang et al., 2022), managing diverse students (Ahmed & Indurkha, 2020), supporting students' attitude to the learning model, varying class technique and engaging students into the flipped

classroom' activities (Durrani et al., 2022). Apart from that, flipped classroom still brings challenge (Lo & Hew, 2017). They reported that a variety of activities are needed to provide along with instructional videos and small-group activities for pre-class (e.g., online exercises) and in-class (e.g. brief review, individual practices). Other challenges is dealing with students difficulty in self-regulated learning, heavy learning workload, lack of continuous support, and lack of ICT resource (Vuong et al., 2018). Some challenges like language issues barriers to autonomous learning, as well as technical and technology (Singh et al., 2021) are faced by international students in Australian University. On teacher's side, the challenge dealt with supporting facilities, technical and technological problem, and creating flipped learning material (Ansori & Nafi', 2019).

The studies on flipped classroom mainly focused on the effect of flipped classroom toward students' learning (Akçayır & Akçayır, 2018; Gough et al., 2017; Lowell Bishop & Verleger, 2013; Supiani et al., 2021), flipped classroom activities (Díaz et al., 2021; Durrani et al., 2022; Förster et al., 2022), flipped for particular education (Çoruk et al., 2020.; Ummah et al., 2020; Wolff & Chan, 2016)(Akçayır & Akçayır, 2018; Lee et al., 2022; Phillips & Wiesbauer, 2022; Vuong et al., 2018; Wang et al., 2022), or challenge in implementing it (Akçayır & Akçayır, 2018; Lee et al., 2022; Vuong et al., 2018), However, there are still limited studies on students' cognitive engagement and academic performance in a flipped classroom model, particularly for outstanding class program. Outstanding class program in the research setting is a class which is formed to prepare the students who can memorize the Qur'an completely and have English language skill.

Learner engagement in learning correlates strongly with academic achievement and satisfaction (Halverson & Graham, 2019). It covers the willingness of the students in taking on the learning task at hand, the level of involvement in carrying out the task and the learning persistence over the period of time. Here, the learning persistence as part of cognitive engagement (Rotgans & Schmidt, 2011) is categorized as a psychological state of the students who are working very hard grasp a subject. The cognitive engagement can be defined as the level of a student's willingness and the ability to handle the current learning assignment. Scholars works on cognitive engagement in learning have been varied like its correlation with self-regulated learning (Li & Lajoie, 2022), problem based learning (Rotgans & Schmidt, 2011), in e-learning discussion forums (Kew & Tasir, 2021), instructional practices (Barlow & Brown, 2020), in blended learning environment (Iqbal et al., 2022). Yet, study on its correlation with flipped classroom still limited and need to be explored.

The current study will fill the gap by exploring the cognitive engagement of students in a flipped classroom model of an outstanding class program as well as exploring their academic performance toward it. The objective of the study is to reveal the impact of flipped classroom model in terms of students' cognitive engagement and academic performance regarding it. The research finding will give contribution on knowledge enrichment of flipped classroom model.

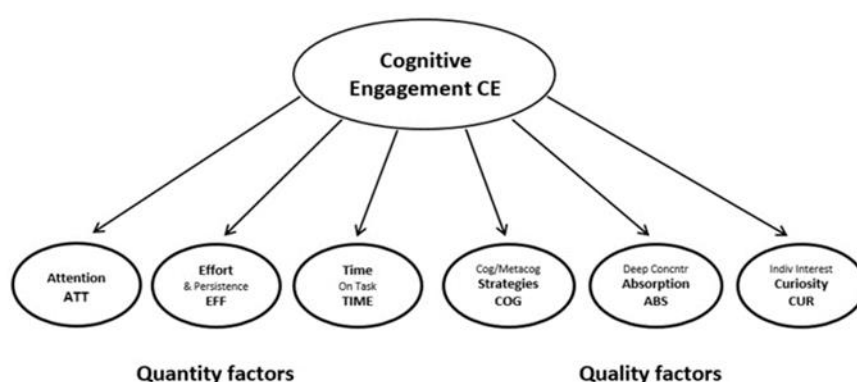
## **METHOD**

Mixed method design was used in this study. The qualitative data was used to get the data on students' cognitive achievement, and the quantitative data was used to get data on students' academic achievement. The research location was at

an Islamic private school in the region of Eastern Indonesia; SMP Muhammadiyah Parepare. The population of the research was the 1<sup>st</sup> year students, 2021/2022 academic year and consisted of three classes. One class is outstanding class and the other two classes are non-outstanding classes. Outstanding class is designed to prepare students who can remember the Qur'an completely, non-outstanding classes concentrate on studying general knowledge and do not have the goal of having students memorize the Qur'an completely.

Nonrandom sampling strategies were applied and purposive sampling was the main way to choose the research sample. Purposive sampling referred to judgement sampling as the process is selecting the sample that is believed to be representative of a given population (Gay, L.R; Miles, Geoffrey E; Airasian, 2012). Purposive sampling is selected for inclusion in the sample because they are the easiest for the researcher to access and best suited to help the researchers answer the research questions. The research sample chosen was outstanding class by considering the researcher's knowledge and experience as the English teacher in this school particularly on outstanding class. It will be easy to arrange the research time and students' willingness to participate in the research as the researcher teaches in the class. The outstanding class program in the school known as Muhammadiyah Tahfidz Class (MTC). MTC is a specific class which is formed to create outstanding students who can be tahfidz (holy Qur'an memorizer) but still having general knowledge subjects including English language subject. There were 18 students in the class who participated in the research.

In collecting the data, observation checklist, field notes, and students' learning result are the main research instruments. Observation on students' cognitive engagement used the concept of Halverson & Graham (2019) covering observation on students' attention, effort and persistence, time, cognitive/metacognitive strategies, absorption, and curiosity. The observation checklist was made based on the items mentioned previously, and field notes on the cognitive engagement items was also made to deepen the information. The pattern of cognitive engagement (CG) can be seen at the figure 1 below.



**Figure 1. Cognitive Engagement**

The data on students' academic performance was taken from students' English writing test on descriptive text. The writing test was done twice; pre-test

and post-test. In the test, the students were asked to make short writing minimum 100 words about people around them.

In analyzing the data, the observation result was analyzing using thematic analysis of (Clarke & Braun, 2013) and students' learning result was analyzed using Heaton rubric on writing including content, vocabulary, grammar, spelling, punctuation/mechanic then tabulated into the standard scoring of National Education.

## **RESULT AND DISCUSSION**

### **Results**

#### ***Students' Cognitive Engagement***

In understanding students' cognitive engagement, the model of cognitive engagement by Halverson & Graham (2019) is the authors main preference. In the research, the data of students' cognitive engagement (CG) in flipped classroom was taking into account via observation notes during three months. The data of CG was looking into some aspects such as students' attention, students' effort and persistence, students' time on task, cognitive/metacognitive strategies, absorption, and curiosity during the implementation of flipped classroom.

#### ***Students' attention***

In implementing flipped classroom, the teacher researcher made WhatsApp Group (WAG) as a media to communicate with the students. This group became the main media in connecting students and teacher about the classroom activities prior offline meeting. It is used for-like sending learning material, reminding the material or task, checking the students' response on class material or about the task given. In observing students' attention; students' activeness, class response on online activities and offline meeting were observed intensively using field notes and observation checklist.

Based on observation notes on students' attention, it showed different result on responses and activeness from the students between online activities via WaG and offline meeting in the classroom. When the teacher started the chat in WaG with casual chats such as greeting, all students replied nicely, some of them put happy emoticons along their chats. Then, the class material was sent, the students were asked to learn the material in YouTube video. The students replied nicely and promised to watch the video. Students' attention in this stage is considered high as they replied the chats enthusiastically. Yet, five students out of eighteen watched the video, while others did not pay attention to the teacher's instruction. In order to draw students' attention to watch the video, the teacher kept chatting them to draw the students' attention.

In offline class or face-to-face meeting, the students paid attention highly on teacher's instruction. They responded the teacher's instruction and explanation during the class. When the teacher reconfirmed about material which was sent previously, only five students replied. It means only few students watched the learning video. So, the teacher re-explained the class material to make students understand on it and gave some assignments about it. The students' attention was higher in this face to-face meeting though the material sent priorly outside the class helped students understanding about the class material.

### ***Effort and Persistence***

Students' efforts in learning English by flipped classroom were fluctuated. When the class material was sent prior to classroom meeting using WAG, few students watched the video outside the classroom. Only few students who put an effort to watch. The other students tried to understand the class material when they were inside the classroom. It seems, they were more enthusiastic when accompanied by their teacher and classmates. They get easier in understanding the class materials as they were free to ask the questions and get the real time explanation and answer.

Students' level of persistence in learning materials and doing task need attention and push. The teacher should make more activities to engage students in flipped classroom. In online activities, attracting students' attention to respond actively need to be courage like facilitating students with more interesting videos, providing games or making short quiz. The students' effort and persistence in learning English showed better in the classroom as they respond more actively in the class, enjoying doing the class activities, doing the work class enthusiastically. They like learning English more in the classroom as various worksheet were available to support their learning and they were supportive by good supporting system from the teachers and their peers.

### ***Students' time on task***

The task given by the teacher was on two version, online-task and offline task. Online task was given via WaG along with the class material. The task was quite easy in this part as the main aim in online session was sent the class material to make student got prior knowledge about it. The task was asking about the topic of the video, and who is the characters in the video. The questions given to the students was just to keep students' attention toward the learning material. In the online activities, only five out of eighteen students who replied the task. Others delayed the task given by not responding the chats.

In the classroom, students can manage the learning time well. The time given by teacher was 90 minutes allocation in classroom with 300 minutes for teachers in opening, explaining the material, and closing. Then the rest, students' time to do work class individually and group. Here, the students can manage well the task given and can submit it on time. It is clearly seen during the research that online activities needs more courage to organize regarding class task, while the time for students' task in inside classroom activities can be arranged well by the students. Also, the teacher's direct control in the classroom affects the students' time in doing the task.

### ***Cognitive/metacognitive strategies***

Students used some cognitive strategies to deal with learning about English during the implementation of the flipped classroom. The term "cognitive strategies" refers to particular techniques that students employ when solving problems. It enhances learners' cognitive abilities and shapes them into adaptable, strategic learners. Each participant in the study used a different cognitive strategy, such as summarizing the lecture material, visualizing the material to help them remember it, organizing new vocabulary, or practicing the subject repeatedly. Students chose the cognitive strategies in the research classroom that they felt would best support the development of their thinking abilities. Few students chose the repetition



strategy, with the majority of students using imagery and memorization. These two learning methods predominated among the students.

### ***Absorption***

Students learned more in the classroom during the implementation of the flipped classroom in the study of English than they did outside of it. They were attentive to the teacher, the lesson, and their friends. They completed the assignment, managed their understanding of the lesson, and interacted with their teacher and classmates effectively. Their enthusiasm for participating in the class activities revealed how much they had retained from the lesson. In contrast, the students demonstrated poor retention of the lesson outside of the classroom through their low participation in extracurricular and online activities, such as their slow response in the WhatsApp Group. Only a small number of students engaged in online activities with enthusiasm and regularly responded to teacher chats.

### ***Curiosity***

Regarding students' interest in learning as a component of cognitive engagement in a flipped classroom, the students were more interested in classroom activities than extracurricular ones. They showed a genuine interest in the material by actively participating in class discussions and paying attention to it. They actively participated in class activities by asking questions about the teacher's unclear explanations or assignments, working together with their classmates to find solutions, and participating in discussions. For extracurricular activities, there are different rules. The sent course material didn't pique the students' interests very much. They didn't want to watch the instructional video that the teacher had sent, and they only gave brief responses in the chats. In order to successfully implement the flipped classroom in this study, courage is still required, especially for activities that take place outside of the classroom. In order to utilize the work of the flipped classroom, teacher and students must actively participate and collaborate.

### ***Students' Academic Performance on Writing Descriptive Text***

In this study, students' academic performance was concentrated on their English writing on descriptive texts and assessed using Heaton's writing scoring rubric, which considered content, vocabulary, grammar, spelling, and punctuation/mechanics before being tabulated into the National Education standard scoring system. In order to assess the impact of implementing a flipped classroom on students' ability to write in English for a descriptive test, the writing results of the students were checked twice: prior to and after the flipped classroom. For these tests, the students had to write a brief essay describing the people around them.

#### ***Pre-test Result***

The pretest writing performance of the students was displayed in Table 1 and was graded as very poor, poor, fair, good, and very good. Prior to the flipped classroom program's implementation, the test was conducted. The student was asked to write a brief essay on a person's description for the pretest. The [table 1](#) below contains the results of the students' writing scoring.

**Table 1. The students writing of achievement in pre-test**

No		Score	F	Percentage
1	Very Good	86-100	0	0%
2	Good	76-85	0	0%
3	Fair	56-75	7	38,88%
4	Poor	41-55	7	38,88%
5	Very poor	≤40	4	22,22%
<b>TOTAL</b>			<b>18</b>	<b>100%</b>

The students' writing scores ranged from a very poor classification to a very good classification, as shown in the table above. No student received a good or very good score in the table, indicating that the students' writing still needs to be improved. The range of the writing score was from very poor to fair. Seven students received the highest score that qualified for a fair classification (38, 88%). Seven out of the 18 students who received a poor classification received a score (38, 88%), and four students received a very poor classification (22, 22%). It is obvious that students' ability to write descriptive texts in English was still quite limited. They still lack writing skills, especially when it comes to writing descriptive texts. The main difficulties students face when writing English are a lack of practice and a limited vocabulary.

#### **Post-test Result**

The classroom was "flipped," with students receiving class materials earlier to be recognized with writing-related learning materials. The class member received a learning video and straightforward instructions regarding activities outside of class via WhatsApp group. As part of the flipped classroom in online communication, the teacher made an extra effort to keep the students' attention on the outside class activities. Few students, however, responded to it because their parents had helped them learn. Others were lacking a strong support system from their surroundings. The students in the classroom were more eager to learn and actively participated in the learning activities, including listening to the teacher's explanation, completing the assigned task, cooperating in groups and individually, and clarifying any questions. The teacher played the instructional video again in class and explained it because many students hadn't watched it when it was sent earlier. The results of the students' post-test were impacted by this technique, as shown in [table 2](#).

**Table 2. Students' writing result in post test**

No	Classification	Score	F	Percentage
1	Very Good	86-100	5	27,77%
2	Good	76-85	9	50%
3	Fair	56-75	3	16,66%
4	Poor	41-55	1	5,55%
5	Very poor	≤40	0	0%
<b>TOTAL</b>			<b>18</b>	<b>100%</b>

The above table showed the writing result of the 17 research students after teaching English using flipped classroom. The total number of participated students was 18, but only 17 who did the post-test as 1 student did not attend the class at that time. The writing result of the students showed higher than before as



many students has achieved *good* and *very good* classification. Previously, there were not any students who got very good and good classification, but in the post-test, there were 5 students (27.77%) who got very good classification, 9 students (50%) got good classification. It showed that there is an increase achievement in writing English of descriptive test. On the other hand, the number of students who got fair, poor, and very poor classification got lower; 3 students (16.66%) got fair classification, and 1 student (5.55%) got poor and no one got very poor classification. Based on these results, it can be said that the students' writing scores and percentages on the post-test are better than those on the pre-test. This means that students' English writing is better after being taught through Flipped classroom.

## **Discussion**

Flipped Classroom (FC) implementation in many previous research reveals positive change in education world. It brings new vibes for teacher and learners (Alamri, 2019; Etemadfar et al., 2020; Hava, 2021; Lestari, 2021). Also, FC can support the activeness of the students in learning, boost self-regulated learning, better learning environment, promoting students learning responsibility and peer collaboration (Ali Ghufron & Nurdianingsih, 2021; Chiquito et al., 2020; Deng, 2019; Fredriksen, 2021; Gillette et al., 2018; Hava, 2021; Pasaribu & Wulandari, 2021). In the present research, flipped classroom implementation is bit change with previous studies as it focuses on cognitive engagement and academic achievement of students from an outstanding class program. An outstanding class program is a specific class in private Islamic School that is formed to prepare the students to be hafidz or hafidzah (the person who memorize the holy Qur'an). This program focuses their learning in Islamic value and holy Qur'an besides learning general subject. In the class, the students are banned to use mobile phones, but they still can use their handphones at home.

When flipped classroom implemented in the research, students' cognitive engagement outside class activities and inside classroom were wide-ranging. The six types of cognitive engagement concept of Halverson & Graham (2019) in flipped classroom model work better in the classroom setting than outside class activities. The lack of exposure on the work of flipped classroom is one obstacle faced by teacher in implementing FC. This is also faced by other researchers (Ali Ghufron & Nurdianingsih, 2021; Strelan et al., 2020; Zainuddin & Halili, 2016). Other challenge in implementing FC is low collaboration between the teacher and parents in observing students' activities outside the classroom. The parents are supposed to control students WAG and reminded the students on online class activities such as watching learning video, and doing simple task. The lack awareness of the students toward the class material which was sent earlier blocked the form self-regulated learning of the students. It is a bit different with prior research that reported FC forming students' self-regulated learning (Xiao et al., 2021).

Regarding academic performance on English writing in the research, flipped classroom can increase students' writing even though with slightly change. The exploration on the effective work of FC is still need to do as previous research suggested (Erbil, 2020; Rasheed et al., 2020; Saira et al., 2021; Turan & Akdag-Cimen, 2020). Flipped classroom can ease the teaching of writing if it is well-explored. Sending the class material earlier to be learnt at home can assist the students to comprehend the lesson. So, when they come to classroom, they can

understand the lesson quickly. In the research, students' activeness in learning the class material prior before get into the classroom still need to be courage. Collaboration between teacher, students and parents were still low.

Even though the implementation of flipped classroom in this research still needs to be explored much to achieve its effectiveness, it is still a promising learning model particularly for teaching English writing. The learning video sent earlier may assist students acknowledge their prior understanding of the class material. This is necessary in teaching writing as one of the hardest skill to be taught. Providing students with prior understanding of the class material before coming into classroom can ease the learning process, make the teaching time efficient, reach more comprehension for both parties, and ease students in doing the task. It correlates with the basic principle of flipped classroom; ease the teaching learning process(Jang & Kim, 2020).

## CONCLUSION

The aim of the present research was to examine the implementation of flipped classroom in terms of students' cognitive engagement and academic performance in English writing in an outstanding class program. The study has identified that students' cognitive engagement in flipped classroom did not expose much at outside class activities. The number of students who active and engage in outside class activities like watching the learning video and doing simple task from the teacher is only one forth from the total number of students. Nevertheless, students were active in the classroom and enjoyed doing classroom activities. The second major finding was the slight improvement of students' academic performance on English writing. Flipped classroom implementation still needs to be exposed to get its effectiveness in educational context. The evidence from this study suggests that flipped classroom will show its effectiveness in educational context if it is well prepared and well-exposed. Teacher's creativity, active students, parents' awareness, well prepared classroom are contributing factors of flipped classroom's success.

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