A Conceptual Framework on Technology Integration in English Writing Flipped Classroom

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Abstract. As the education world revolves to Education 4.0, flipped classroom is seen to be one of the learning approaches that best described the future learning. Flipped classroom ticks every pillar for Internet of Things which are things, people, process and data. In flipped classroom, the things are the devices that the students use, such as computer, tablet or smartphone. The people that are involved in flipped classroom are teachers and students. The process that happened is teaching and learning. The data is transmitted through educational platform such as Google Classroom and Microsoft Teams. Flipped classroom transforms the conventional classroom by flipping the theoretical part to be done before the class and making the class to be student-centered and focusing to the practicality part of the lesson. Nonetheless, the research on flipped classroom is still limited in Malaysia, especially the primary school English language students. Hence, this paper aims to fill in this research gap by designing a conceptual framework for flipped classroom in teaching English writing to cater primary students with aims to improve students’ writing performance and motivation. The correlation between students’ writing performance and motivation will be observed too. In this respect, the proposed framework is integrated with technology based on Internet of Things, 21st century learning, social constructivist theory, Bloom’s revised taxonomy and motivational model. By using this conceptual framework, a set of teaching module is developed and to be implemented in English writing class for primary school students. This research also aims to use a mixed-method research design with three different instruments; writing test, questionnaire and interview to test its effectiveness, as it is believed that the implementation of flipped classroom can improve students’ English writing performance and their motivation. 64 students will be the participants of this study and they will be divided into two groups, control group and experimental group. Control group will go through conventional English writing class while experimental group will experience flipped classroom. The findings of this study will be beneficial for ESL teachers, ESL primary students and Ministry of Education.

1.0 Introduction
As we are progressing, education and Information, Communication and Technology (ICT) are interconnected. With the assist of ICT, educators and learners able to bring education to the next level. Internet of Things is just one of the components in ICT. Internet of Things (IoT) consists of four pillars;
things, people, process and data. Internet of Things generally refers to the world of devices and objects that are connected through the Internet [1]. In linking the ecosystem of Internet of Things to language classroom it allows the teachers to reassess the learner’s level of knowledge, identify the importance of mobile device, reconsidering the teachers’ role and maximise the use of emerging technologies to create innovative teaching and learning environment. These elements are coherent with flipped classroom. Flipped Classroom (FC) can be defined where the presentation of the lesson in the classroom and the homework have been flipped, whereby students will learn the content of the lesson before the class so that students can be more engaged in the lesson in the classroom. In flipped classroom, the things are the devices that the students use, such as computer, tablet or smartphone. The people that are involved in flipped classroom are teachers and students. The process that happened is teaching and learning. The data is transmitted through educational platform such as Google Classroom and Microsoft Teams. Therefore, this paper aims to implement flipped classroom in English writing primary classroom and investigate its effects towards students’ writing performance and motivation.

2.0 Literature Review

2.1 Internet of Things in Language Classroom
The application of Internet of Things in language classroom is widely spread in the education field. It is just a matter of how the educators apply and utilize it in the classroom and out of the classroom. Coanca [2] suggested that teachers use mobile device as the learning tool in learning English. The use of mobile device is one of the components in IoT, which represent the things. Mobile device can be utilized to assess the educational platform that integrates English language learning activities and assessment. With the use of mobile device, the educators can administer assessment that is suitable with the students’ level. [Coanca [2] also proposed the educators to use QR codes (quick response codes) to enhance listening activities through the smartphone. Although the use of mobile device is not one solution fits all, language teachers should adapt the use of such technology in their lesson.

In addition, Hu & Deng [3] conducted a study examining the effects of using multimedia on students’ learning in the ESL classroom. The finding of this study shows that multimedia vocabulary teaching was useful for the students and improve their word recognition ability. The usage of multimedia vocabulary also enhances students’ English as a whole. Multimedia can be a new tool to provide diversified learning style to deliver the lesson based on the students’ learning preferences. Moreover, with the integration of multimedia, visual, auditory and hands-on interaction would aid the learners in language learning. Multimedia is part of IoT as the data transmitted to the students.

In regards with the emerging of IoT in language classroom, Wang [4] proposed an English interactive teaching model which based upon Internet of Things. The researcher pointed out some important points that reflects the characteristics of learning through IoT. One of them is the motivation to introduce IoT in teaching so the students can improve their English proficiency. It will drive the students to comprehend English as recreational and communicative tool. IoT also provides international language environment. IoT also allows teachers to find reliable teaching resource for the students and the students can also learn according to their own pace. Wang [4] developed a courseware that helps the students in pronunciation. The students learned using the courseware at home and when in class, the teacher only focused on discussion and training the students’ language skills and abilities. This is similar with flipped classroom method.

Although many evidences show the effectiveness of integrating IoT in ESL classroom, there are still other issues that need to be discussed such as the availability of the facilities, the teachers and students’ readiness of using the technology and other technical issues that might occur. Besides that, with the usage of technology during the lesson, does the teacher have enough time to handle with the technicality aspects of the technology and whether the students have enough time to explore the technology provided? How about the classroom activities if the students are too occupied with using technology during the lesson? This raises a new approach, which is flipped classroom. This study will focus on the implementation of flipped classroom in ESL classroom.
2.2 Flipped Classroom
Flipped Classroom (FC) can be defined where the presentation of the lesson in the classroom and the homework have been flipped, whereby students will learn the content of the lesson before the class so that students can be more engaged in the lesson in the classroom [5]. Berrett, Mangan, Neshyba, Talbert, & Young [6] stated that before the class, students would be provided with online material so they can learn the topic before the class time in order to dedicate the class time for the students to do activities that resemble active learning. The course content may be delivered in the form of lecture video, PowerPoint slides, PDF, pre-class reading exercise while class time will be fully utilised for group work activities so they will have extra time to collaborate. Flipped classroom is emerged because of Internet of Things, as it fulfills every aspect of IoT.

According to Bergmann & Sams [7], flipped classroom is a student-centred approach to learning where the role of the students is as active learners. The instructor or the teacher will act as the facilitator to guide, motivate and give appropriate feedback to the students’ performance. By implementing flipped classroom approach, the teacher can flip the classroom by moving the traditional lecture lesson to video and the students can watch and listen to the video before they enter the class. This will provide the students freedom to watch the video according to them and encourage them to learn independently. This will also enhance students’ collaborative learning. By flipping the class, the teacher would not spend so much time in class explaining the topic and the students would get ample of time by executing the projects collaboratively and individually, depending on the activities. In addition, by applying flipped classroom approach, the students will have the opportunity to use various type of technology media in learning activity independently. The instructors will also utilise various technology media in their lesson [8].

Abdullah, Hussin & Ismail [9] investigated the implementation of flipped classroom and its effectiveness on English speaking performance among undergraduate students. They employed pre and post-oral proficiency test, observations and focus group interview. They found that the application of FC is a practical approach in teaching speaking to ESL classroom. It was also found that most participants performed different conversational activities comfortably due to the increase in their motivation and the decrease in their speaking anxiety.

Besides that, Al-Harbi & Alshumaimeri [10] conducted a study to examine the impact of flipped classroom on secondary school students’ performances, perceptions, and attitudes toward learning English grammar independently. The finding from this experimental study shows that flipped classroom enhance students’ grammar performance, but it is not statistically significant. This study also found that the students’ have a positive attitude towards the implementation of flipped classroom in learning grammar.

Other than that, Alnuhayt [11] investigated the use of flipped classroom in teaching vocabulary. The findings from the post-test shows that the experimental group obtained higher score than the control group. The analysis of the questionnaire indicates that students in the experimental group had positive attitudes towards flipped classroom.

Some researchers examine the effects of flipped classroom on students’ English language skills, however, most of the studies were conducted towards tertiary and secondary education. Therefore, this study will fill the gap and conduct a study on the implementation of flipped classroom in ESL primary classroom.
3.0 Conceptual Framework

Figure 1 shows the conceptual framework of flipped classroom. Bennet et al. [12] stated that although two flipped classrooms do not look similar, they have shared features which is active delivery of information before the class so the students will have extra time to do activities in class. Next, the teacher will become the facilitator to guide the students rather than dispensers of facts and students will become active learners rather than passive learners who listen to the information given. With the usage of online sharing platform such as Google Classroom, this will create a permanent archived tutorial of the class content. Students will have the opportunity to learn independently. Thus, the students would have extra time to complete the task and activity during class time. The conceptual framework of flipped classroom is based on the elements of IoT, which are things, people, process and data. There are two parts in a flipped classroom setting, which are before class and while class.

3.1 Before

In before class setting, the things involved are devices that the students can use at home such as laptop, computer, smartphone and tablet. Next, the people refer to the teacher and students. The teacher will provide the students with instructions for the task before the lesson that they need to do. The students’ act as an independent learner as they only need to watch the video and follow the teacher’s
instruction. They are responsible for their own learning, thus making them as an independent learner. This activity describes the teacher’s role as an instructor.

All activities out of the class is flexible, regardless of place and time, depending on the students’ academic levels and individual needs [13]. For this research, as the participants are primary school student, cooperation from parents and family is needed to ensure a successful flipped classroom setting. However, parents are only needed to supervise the students as it is also part of self-regulated learning. Self-regulated learning is the process element of IoT that happens in flipped classroom.

The data of flipped classroom refers to the knowledge acquisition on how the students get the input for writing activity. This corresponds with Bloom’s Revised Taxonomy, which involved remembering and understanding skills. The teacher needs to provide authentic materials before the class, such as lecture video or virtual reality activity about the topic that they are going to learn. Supplementary video link from www.youtube.com can be provided for the students to watch as additional materials. The materials would be available in educational platform such as Google Classroom and Microsoft Teams.

3.2 While Class

After the pre-class task was done, the students will proceed with in-class activities. The example of things element in while class activity is teaching aids such as i-think map and writing book. In this stage, the teacher will act as the facilitator while students will become active learners which represent the people. The students will receive guidance from the teacher during class interaction and activities. Teachers can improve interaction with students, monitor and scaffold individual development, and give direct feedback [13]. Scaffolding is known to align with constructivism. Once students can do the tasks on their own, the teacher need only supervise them. This is a part of knowledge construction which is the data. The students move from the lower part to the higher part of Bloom’s Revised Taxonomy which are applying, analysing, evaluating and creating.

The process of flipped classroom involves active learning and collaboration. Winne, Hadwin & Perry [14] suggested three types of collaboration regulations. Firstly, every group member must take responsibility for his or her learning. Secondly, every group member must support other group members in regulating their learning (co-regulated learning), and the group must collectively regulate their learning processes (shared regulation of learning). When the students are collaborating during the planning phase, task performance and reflection, it is known as shared regulation [15]. According to Andrews, Leonard, Colgrove, & Kalinowski [16], active learning may occur when an instructor avoids lecturing and students ask a question or focus on an assignment designed to help their comprehension, such as think–pair–share conversation or pair plays and exchange their responses with the entire class. Such approach puts learning within the construction of knowledge presented through peer-interaction and direct feedback. Construction of knowledge happens when students use the input of writing they have before class and use it in the activity of writing that happens in class.

According to Sams & Bergmann [7], flipped classroom is a student-centred approach to learning where the role of the students is as active learners. The instructor or the teacher will act as the facilitator to guide, motivate and give appropriate feedback to the students’ performance. By implementing flipped classroom approach, the teacher can flip the classroom by moving the traditional lecture lesson to video and the students can watch and listen to the video before they enter the class. This will provide the students freedom to watch the video according to them and encourage them to learn independently. This will also enhance students’ collaborative learning. By flipping the class, the teacher would not spend so much time in class explaining the topic and the students would get ample of time by executing the projects collaboratively and individually, depending on the activities. In addition, by applying flipped classroom approach, the students will have the opportunity to use various type of technology media in
learning activity independently. The instructors will also utilise various technology media in their lesson.

4.0 Implementation of English writing flipped classroom

The implementation of flipped classroom in English writing class will be conducted in four weeks. The researcher will conduct the lesson based on Year 5 English Textbook. In week 1, before the class, the students watch the videos about interesting places in Sabah and Sarawak posted in Google Classroom and read the article. The students need to find interesting places in Sabah or Sarawak using search engine and write the important information about the place. Next, while in class, every student will share their findings about interesting places in Sabah and Sarawak with their group members. Students will create a poster about the selected places in Sabah and Sarawak in group. They will use Google Slides in making the poster. The teacher chooses to use Google Slides as the students can use their own computer and edit the poster online, at the same time. This is aligned with collaborative learning process whereby every student has their own role in group work. This way, no one will be the passenger. The data involved are the videos, the information found by the students, Google Slides and Google Classroom.

In the second lesson, the students will experience living in International Space Station through virtual reality. Using virtual reality at school might be a problem because the lack of facilities, but they can do it at home easily using their own devices, which represent thing from IoT. In class, they will do a hot seat activity, which represents the process from IoT. Hot seat activity is whereby a student will sit in front of the class and be the expert on the topic. In this lesson, the expert of the topic is an astronaut. So, one student will be an astronaut. Other students will discuss the questions that they want to ask to the astronaut. The astronaut will answer the questions accordingly. This is where analysing skill is applied. The teacher’s role is as a regulator who is to make sure the question and answer session will run smoothly. Then, individually, the students will write a narrative essay entitled “A day in International Space Station”. The data that is involved in this lesson is the virtual reality and also the essay.

In the third week, the students watch the video about volcano eruption and how to make clay volcano. These are the data for before class activity. Since they will watch the video at home, this will reduce the lesson delivery time in class and giving them more time to make the clay volcano in group. This is where the students collaborate with each other. This activity is parallel with Bloom’s Revised Taxonomy skill, which is creating. After that, students will demonstrate how the volcano eruption happens using the clay volcano model. This activity portrays authentic learning.

In the fourth lesson, before the class, the students watch the video about unique building posted in Google Classroom. Then, they need to find other unique buildings, print the pictures and find information of the unique buildings. In class, the students are exchanging information through Rally Robin activity. Then, in groups, students will use a consensus map to discuss the features of their unique buildings. Every group member will need to write down their suggestions on the features of the unique building. Then, they will decide on the best features for the building. This collaborative activity will improve students’ decision making. This lesson regards the video, the information and the consensus map as the data. While as for the process, the collaborative learning takes place.

In the fourth week, the researcher will evaluate students’ English writing performance through test. This research also aims to use a mixed-method research design with three different instruments; writing test, questionnaire and interview to test its effectiveness, as it is believed that the implementation of flipped classroom can improve students’ English writing performance and their motivation. 64 students will be the participants of this study and they will be divided into two groups, control group and experimental group. Control group will go through conventional English writing class while experimental group will experience flipped classroom. The findings of this study will be beneficial for ESL teachers, ESL primary students and Ministry of Education.

5.0 Implication
The researchers are in the process of collecting the data. However, it is expected that the students would be benefitted from flipped classroom. Their writing performance and motivation would improve, in parallel with past researches. Students may go through a collective discovery process and learn how to delegate tasks and take responsibility for their learning. The use of technology in which students watch videos to gather additional resources before the class prepares them for the future. This is similar to active learning where they are no longer a passive learner, with the teacher's instruction; they must participate actively in the class. Students can re-watch the video if they ever need to understand the lesson better. They will also have ample time to search for additional information about the topic, helping them learn at their own pace, according to their academic performance and learning style. Students will be more willing to learn, rendering the lecture more successful in the classroom. They will contribute to group activity and communicate with their peers once they have already accumulated the information. In the long run, students will reach a higher tier of Bloom's Revised Taxonomy, building from the lowest thinking skills, and training themselves to use the higher-order thinking skills.

As we are preparing the students for the 21st century, teachers need to train and update themselves with the latest technology and advance their teaching method. It is suggested that teachers must acquire knowledge of technical, pedagogical materials to keep up with rapid technological changes. This research will provide teachers with the basics of flipped classroom lesson design. Teachers can also reflect on their personal teaching performance and find ways to integrate flipped classroom to increase students' interest and concentration. Flipped classroom is also useful for the teachers to manage time during the lesson. In a traditional lesson, teachers will spend about 15 to 20 minutes describing the topic to the students, thus reducing the time the students have to finish another classroom activity. However, through the integration of flipped classroom, lesson time can be managed better since the presentation of the topic is done before the students come to the class. So, the teacher can monitor students’ works and involvement in the classroom.

The Ministry of Education is determined to promote effective 21st-century learning and flipped classroom as one of the best approaches in 21st-century learning. This research’s findings will be advantageous to MOE in implementing flipped classroom nationwide. Studies on the implementation of flipped classroom are inadequate in primary education in Malaysia. Hopefully, this study will offer relevant data to MOE on flipped classroom in primary schools. Besides that, ESL learning in Malaysia currently follows the Common European Framework of Reference for Languages (CEFR). CEFR focuses on communication skills, which is echoed with flipped classroom as the students will have ample time to communicate with their peers and teachers in the classroom. Flipped classroom module for teaching writing skills will also be developed through this research that can be used by MOE to develop reference and resources for teachers.

6.0 Conclusion
The conceptual framework of flipped classroom can be a foundation for the researcher to integrate Internet of Things with flipped classroom. Internet of Things enable the implementation of flipped classroom to run smoothly. Teachers need to move forward with ICT world and adapting to the current method of teaching. Flipped classroom promotes active learning and collaborative learning through authentic experience. In preparing the students for the future, they also need to get used to the elements of IoT such as the use of technology devices, the data involved and their roles as independent learners.

7.0 Acknowledgement
The authors would like to thank the Universiti Teknologi Malaysia (UTM) for their support in making this project possible. This work was supported by the Research University Grant (Q.J130000.2653.18J20).
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