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Technology Use and Student Engagement During COVID-19: The Case of Online EFL Classes

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Introduction

It is believed that the integration of technology in the teaching and learning process makes the classroom experience more engaging and student-centered (López, 2010). Technology in the learning process has been recognized to benefit students' motivation to learn and, in some cases, even boost their confidence (Li, 2007). It encourages autonomous learning and provides increased access to learners by allowing teachers to deliver lessons remotely, in real time. Much of these benefits apply to courses that are theoretical as opposed to having an emphasis on skill training. However, for language courses, which are more skill-oriented, there seems to exist a dearth of research addressing the influence of technology use in online classes. Although there has been an increase in the integration of ICT in education, there appears to be a scope for research in the context of language learning especially given the recent surge in the heavy incorporation of ICT in education at large. Despite such incorporation, the urgent transition may not have permitted sufficient curriculum adjustment in content and learning.

There are still issues and challenges in creating meaningful lesson content despite the availability of a plethora of online resources. These issues and challenges need to be discussed in order to fully understand teachers and learners' experiences of online learning instruction. Moreover, content-specific research is also scarce, which poses a challenge for researchers and educators alike to explore a more comprehensive view of subject-related online curricula. Sun and Chen (2016) stated that an important area that is worth exploring is the role of content in online courses. It is relevant since a well-designed course has the potential to engage learners (Keengwe & Kidd, 2010).

On the one hand there is the potential of course content to engage students and on the other hand, there is also the potential of pedagogical practices that are utilized to engage students. Particularly, with the surge of technological tools that are inherent in any online education, a study of its influence on student engagement in the context of the urgent change seems relevant. An understanding of how technology use aids the engagement of students in online language learning would seem to fill this gap. Consequently, the following question is formulated:

> What is the influence of technology use on student engagement in online English classes conducted during the COVID-19 pandemic?

Literature Review

Student Engagement

Student engagement has largely been discussed from the constructivist approach, presuming that students engaged in the learning process begin to construct their understanding of the learning materials (Lujan & DiCarlo, 2014). Engagement is typically seen as a multi-dimensional construct that includes behavioral, emotional and cognitive aspects (Fredricks & McColskey, 2012). Engagement is identified as the effort one makes towards learning something, which to some extent, is an outcome of motivation. The way a student is engaged in the learning process rests upon the interplay of several factors. In the educational context, the elements that make up the learning environment can potentially be those factors.

Hew (2014) described four different types of engagement in his study on student engagement in online courses. He used the framework from Fredericks et al. (2004) to describe the four different components of engagement which are simultaneously happening in an online learning classroom. They consist of behavioral engagement, emotional engagement, affective engagement and cognitive engagement. Based on this framework, behavioral or physical engagement is described as the level of participation of students and the completion of activity during online learning. Emotional engagement refers to students' affective responses or feeling towards teachers, peers, the course and learning, whereas cognitive engagement refers to the task-specific thinking that a student employs while undertaking an activity (Helme & Clarke, 2001). The level of motivation students display in each of these components can be used to assess their engagement in an online classroom (Darr, 2012).

Based on his proposed model of student engagement and self-determination theory (SDT), Hew (2014) elaborated on how the autonomy and the structure of the lesson, determines the behavioral and affective engagement of the students. He created the model based on research done by Deci and Ryan (1985) on SDT which revealed that "an understanding of human motivation requires a consideration of innate psychological needs for competence, autonomy, and relatedness" (p. 227); which means that the course activities will decide whether students will be positively involved in the course. The second aspect of SDT is the relatedness of the lesson and its effects on the behavioral and affective engagement of students, as well as the way student competence affects cognitive engagement during an online course. Fredricks et al. (2004) explained cognitive engagement as the investment in using their mental skills when enforcing critical thinking skills. Based on McLoughlin and Luca's (2000) compilation, in order to engage cognitively students should:

a. offer and receive assistance;
b. exchange resources and information;
c. explain and elaborate on concepts
d. share existing knowledge;
e. give and receive feedback;
f. challenge others' contributions;
g. monitor each other's contributions;
h. engage in collaborative tasks; and
i. negotiate solutions to problems. (para. 13)

Student Engagement and Technology

With the introduction of technology, practices such as flipped classrooms and blended learning are marked trends in 21st century education (Chen et al., 2010). Participation, collaboration and a friendly climate among others are characteristic features of engaging learning (Deschaine & Whale, 2017). Maintaining these characteristics can be particularly tricky in online learning environments, given the potential inherent challenges—computer and internet infrastructure (Rao & Giuli, 2010). Student

engagement needs to be the focal point in the learning process with regards to active learning. Active learning has been found to be of great benefit for educational outcomes and it requires specialized planning by teachers, who must consider the added factor of technology infrastructure (Riley & Ward, 2017).

Furthermore, student engagement and motivation are also tested due to many factors such as the reliability and availability of infrastructure and the students; and the types of assessments given to the students through the use of technology. Bergdahl et al. (2020) further categorized the use of technology in the learning process into learning-oriented technology and non-learning-oriented technology, and that it is not the technologies that motivate or demotivate students, but rather, the underlying motives that direct and drive behavior.

Emergency Online Learning

WHO declared COVID-19 a pandemic on the 12th of March 2020, which led to the national closures of schools in an estimated 107 countries in the following six days. Institutions quickly took to online platforms to avoid the disruption of education. Looking back to 2003, the Severe Acute Respiratory Syndrome outbreak in China forced the government to close all schools and educational institutions to curb the spread of the virus. There was an urgent need to transition from the traditional classroom to online learning which required teachers to quickly rethink their teaching strategies to create an effective learning environment without compromising teaching objectives and outcomes (Fox, 2004).

In some cases, the closure of schools and educational institutions impeded student performance. Learning a foreign language for example, especially for lower-level students, requires great effort from teachers and students online (Liu & Cheng, 2014). Compared to the traditional teaching mode, online teaching can lack significantly in terms of engagement for both students and teachers. The virtual world also poses difficulties for many academicians who are continually expected to possess higher levels of technical competence and proficiency in addition to their daily academic workload (Gillett-Swan, 2017).

The socioeconomic background of students poses another challenge in learning online. Educational inequality presents a challenge for institutions and parents to provide learners with an adequate online learning environment (Meyer, 2020). Students who cannot afford devices or proper connectivity struggle to meet the demands of today's virtual learning phenomenon. Some might say inexpensive technology is readily available for them, but this calls into question the amount of investment needed in acquiring devices that would allow them to continue learning.

Meaningful learning outcomes can be very beneficial to students and teachers as students build collaborative skills (Steinbronn & Merideth, 2008). Online learning, however, poses a significant challenge whereby students' authentic engagement is needed and that it should be encouraged through participation and collaboration (Herrington, et al., 2003). A study conducted by Muillenburg and Berge (2005) on the barriers of online learning shows that social interactions, or rather the lack of them, is a major concern in online learning. Despite these, and a host of other challenges, the need to go online could not be avoided. As such, understanding the influence of technology use on the engagement of students taking classes online could help mitigate the compromise of the quality in online learning.

Methodology

In order to achieve the purpose of this study quantitative methods were utilized. Aligned with this, surveys were used to collect data. Before the data was collected ethics approval from the Ethics Committee of Walailak University was secured (Approval Number WUEC-21-091-01). The collected data was encoded and loaded on SPSS for analysis. Multiple regression was applied to the data and interpretation was made accordingly. Using random sampling the survey questionnaire was administered to 248 students enrolled in second year general English language courses in the year 2020-2021. From the

248, a total of 200 students responded to the surveys. A description of the participants is presented in Table 1.

Participants

The 200 hundred respondents included 28% (n = 46) males and 72% (144) females who were all taking General English classes online during the data collection period.

TABLE 1
Distribution of the Sample in Terms of Their Schools

School	Frequency	Percent
Nursing	14	7
Architecture & Design	13	6.5
Management	65	32.7
Engineering	26	13.1
Pharmacy	12	6
Political Science	14	7
Information Technology	14	7
Liberal Arts	20	10.1
Allied Health	7	3.5
Medical Science	4	2
Science	5	2.5
Public health	4	2
Public Administration	2	1
Total	200	100.0

Procedures

The procedures followed for this study are presented in Figure 1. The survey used for the study was divided into two sections that collected demographic information and opinions of technology use and student engagement. The questions for the survey were adapted from Gebre et al. (2014) measuring two dimensions of student engagement—cognitive and social—with an original reliability score of $\alpha = 0.87$. Additionally, questions to measure technology use were adapted from Laird and Kuh (2005) with an original reliability of $\alpha = 0.82$. In order to adapt it to the current context, questions on specific technology, example WebCT, were removed and then pilot tested to the context of the study. The pilot test of the adapted instrument resulted in a reliability score of $\alpha = 0.83$. This was the survey that was finally utilized for the study.

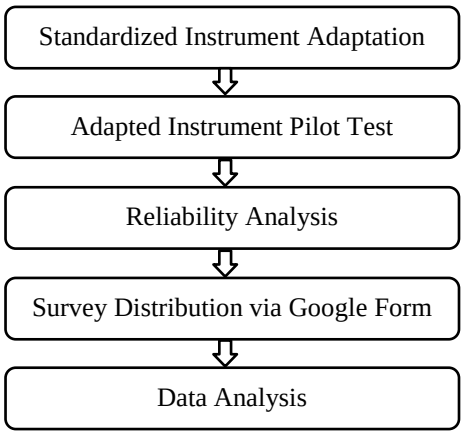

Figure 1. Data collection procedures.

Results

The survey data was analyzed descriptively first and the results are presented in Table 3. The data interpretation made based on the scale shown in Table 2 was adapted from Nyutu et al. (2020). According to these results, we can see that the participants were engaged (M = 3.58; SD = 0.91). Also, there seems to be a consensus on how technology was used (M = 3.88; SD = 0.911).

TABLE 2
Interpretation of the Likert Scale Categories

		Interpretation	
Scale	Range	Engagement	Technology Use
1	1.00-1.80	Not Engaged	Strongly Disagree
2	1.81-2.60	Fairly Engaged	Disagree
3	2.60-3.40	Moderately Engaged	Neutral
4	3.41-4.20	Engaged	Agree
5	4.21-5.00	Highly Engaged	Strongly Agree

TABLE 3
Descriptive Item Analysis

	N	Minimum	Maximum	Mean	SD
The use of technology during online classes helps me achieve the goals of the classes.	200	1	5	3.40	.970
During online classes I try ways to check my understanding of the lesson using technology	200	1	5	3.61	.899
Doing classes online I try to compare and contrast ideas using technology.	200	1	5	3.57	.821
The lessons done online are quite practical and help me get involved in learning.	200	1	5	3.38	.984
I can easily see how what I am learning during online classes is applicable to real work settings.	200	1	5	3.38	.925
The learning activities and discussions during online classes in general are related to real life situations.	200	1	5	3.81	.921
During online classes I interact with other students using technology.	200	1	5	3.98	.940
Besides scheduled classes I interact with my classmates about class discussions using technology.	200	1	5	3.43	.839
I communicate with my teacher using technology when I need help.	200	1	5	3.71	.917
I cooperate with other students to complete my homework using technology.	200	1	5	3.68	.940
I use different sources of information (internet, books...etc.) for my learning.	200	1	5	3.66	.825
I use computers and other technology to make group presentations.	200	1	5	4.28	.941
I have communicated with my classmates to complete class requirements.	200	1	5	3.71	.868
I have done group work for class using technology.	200	1	5	4.37	.968
I have worked in groups during class to do classwork.	200	1	5	3.60	.926
Valid N (listwise)	200-				

To answer the first research question, a regression analysis was performed to test the influence of technology use on student engagement**.** The results are presented in Table 4 and indicate that technology use has a significant influence on student engagement ($p \leq 0.05$). It further suggests that the technology

use accounts for 61% variance in student engagement of students taking online EFL classes (**r^2 = 0.61, F(1, 199, p = 0.00).

TABLE 4
Regression Analysis Test Results

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.783[a]	.612	.610	.45193	.612	311.147	1	199	.000

a. Predictors: (Constant), TU
b. Dependent Variable: SE

ANOVA[a]

Model		Sum of Squares	df	Mean Square	*F*	Sig.
Regression		63.548	1	63.548	311.147	.000[b]
Residual		40.235	199	.204		
Total		103.783	200			

a. Dependent Variable: SE
b. Predictors: (Constant), TU

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	Sig.
1	(Constant)	.993	.146		6.810	.000
	TU	.680	.039	.783	17.64	.000

a. Dependent Variable: SE

Consequent to the findings of this study the following regression equation was obtained,

$$Y = 0.993\ (a) + 0.783\ (\beta TU)$$

Where Y = Student Engagement (dependent variable);
a = constant value or Y intercept;
βTU= technology use (independent variable)

The results, interpreted based on Akoglu (2018), indicate that there is a positive and moderate correlation between technology use and student engagement (r = 0.68, p = 0.00) at the 0.01 level of significance. Additionally, the regression test indicates that 61% of variance in student engagement is explained by technology use. This result suggests that the students in the sample who used technology in their classes identified themselves as engaged. The items included in measuring engagement of students were of the cognitive and social dimensions of the construct. So, the results may be interpreted bearing these two dimensions in mind. Consequently, we may say that the quantitative results indicate that there is a positive and significant influence of technology use on the cognitive and social engagement of

students. The way in which technology use influenced these two forms of student engagement are illustrated in Figure 2.

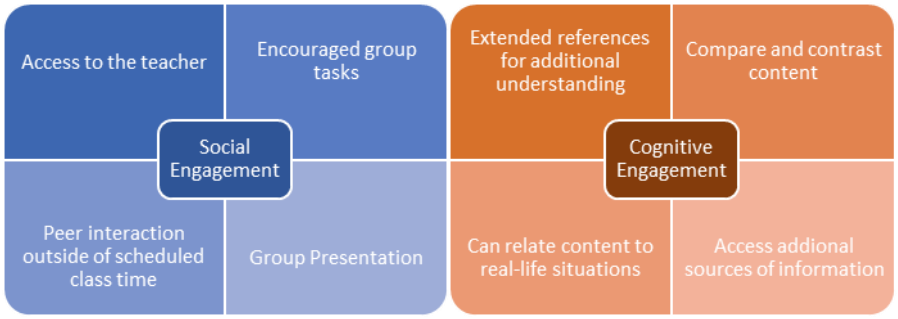

Figure 2. Aspects of social and cognitive engagement during online EFL classes.

The result of this study resonates with Rashid and Asghar (2016), who found that there was a positive relationship between technology use and student engagement. In fact, other studies have had similar findings supporting the idea that the integration of technology in the learning experience can enhance student engagement (Chen et al., 2010; Gachago & Ivala, 2012; Günüç & Kuzu, 2014). For the current era, in which technology has become an integral part of everyday operations in all aspects of life, its benefit and impact cannot be undermined. This study supported the use of technology for student engagement, particularly the cognitive and social dimensions. It must be pointed out here that the negative impact of technology on learning has been noted in previous studies and needs to be given due attention as well (Chu, 2014; Tarafdar. et al., 2015). Therefore, future studies may consider best practices in technology use as well, particularly in the context of online learning in the current circumstances. Furthermore, research evidencing how the use of technology influences language learning outcomes could extend the findings of this study.

Conclusion

In the context of the urgent changes caused by the outbreak of the COVID-19 pandemic, the academic world has seen a sudden shift in the way education is provided. This study endeavored to unveil an understanding of how technology used in online EFL classes influenced the engagement of students. It was found that technology use significantly influenced student engagement and accounted for 61% of its variance. Further, the findings revealed that students were able to utilize technology to access information during classes and engage in group discussions. Additionally, the students agreed that cognitively: technology use afforded them access to additional information, they were able to compare and contrast ideas, they could relate the content learned to real-life situations and they were able to access additional information. Similarly, students noted that in terms of social engagement the use of technology: allowed them convenient access to the teacher, encouraged working in groups, increased peer interaction outside of scheduled class hours and facilitated greatly in group presentations. As a result of these findings it can be argued that online EFL classes created an environment that is conducive for favorable social and cognitive engagement of students.

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