

Strategies of Effective Teaching and Technology Using During COVID-19 Online Learning

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Abstract

Coronavirus outbreak has resulted in schools and universities shut, and as a result, teaching has changed dramatically, with the distinctive rise of e-learning, whereby teaching is undertaken on digital platforms. It is assumed that online learning has been shown to increase retention of information, and take less time, meaning the changes coronavirus have caused might be here to stay. The study aims to investigate the relationship between strategies of effective teaching, technology using, and online learning during COVID-19. The research questions include: (1) Is there any relationship between strategies of effective teaching and online learning during COVID-19? (2) Is there any relationship between technology using and online learning during COVID-19? The quantitative approach was the method used in the empirical study. A structured questionnaire, and a non-random systematic sample of respondents were taken. It is found a positive correlation between strategies of effective teaching and online learning during COVID-19 according to students. The study demonstrated that according to students a considerable % of the variance on online learning is explained by strategies of effective teaching. The study also showed that according to students there is a positive correlation between technology using and online learning during COVID-19. It is also revealed that according to students a considerable % of the variance on online learning is explained by technology using during COVID-19.

Keywords: effective teaching, technology using, COVID-19, online learning

Introduction and Literature Review

In March 2020, the schools and universities began shutting down in an effort to slow the spread of COVID-19. Millions of students, as well as teachers, administrators, and families, have had to adapt at lightning speed. As the countries move through, and then out of the pandemic, there are ample opportunities for education funders to continue to impact the future for millions of learners. With this sudden shift away from the classroom in many parts of the globe, some are wondering whether the adoption of online learning will continue to persist post-pandemic, and how such a shift would impact the worldwide education market (Grantmakers for Education, 2020). The study aims to investigate the relationship between strategies of effective teaching, technology using, and online learning during COVID-19. The research questions include: (1) Is there any relationship between strategies of effective teaching and online learning during COVID-19? (2) Is there any relationship between

technology using and online learning during COVID-19? The quantitative approach was the method used in the empirical study.

Conceptual Framework

The conceptual framework for the study, as shown in figure 1, is developed from a review of existing evidence about the relationship between the interested variables. The review including a search for relevant empirical research through Sage and ERIC, using the keywords effective teaching, technology using, and online learning. The results of the study were interpreted in terms of research conducted in the field.

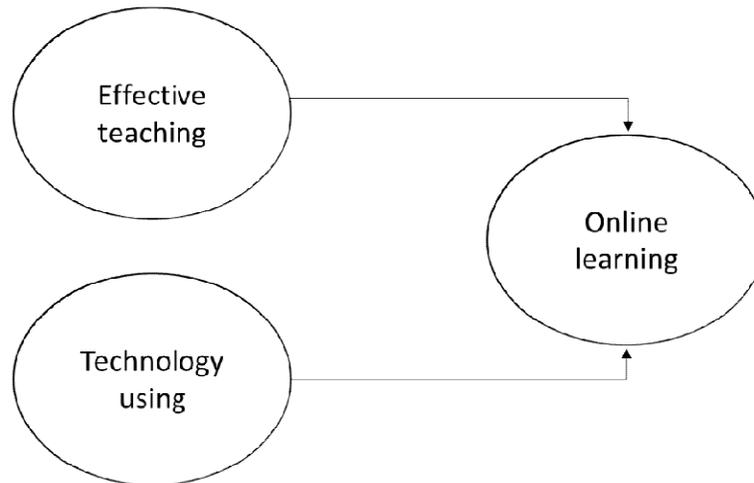


Figure 1: Conceptual framework

Literature Review

The relationship between the strategies of effective teaching and online learning.

The strategies of effective teaching' variable is supposed to influence online learning. Many authors have done a lot of research to investigate the association between the strategies of effective teaching and online learning, especially during COVID-19.

Online teaching and learning tools often integrate several cognitive learning strategies with the goal of actually enhancing learning (Shaw, Mac Isaac, & Singleton-Jackson, 2019); meanwhile, George (2020) demonstrated that the online teaching methodologies utilized avoided the student performance from degrading below what has been experienced in the past academic years. Trust, Carpenter, Krutka, & Kimmons (2020) indicated that #Remote Learning and #Remote Teaching hashtags served as spaces for meeting educators' cognitive, social, and affective needs; as well as Hedger (2020) found out that continuous learning encompasses the use of online platforms to conduct classes, streaming and TV-based content, teaching assistance online or by phone, assigning and mailing resources and lesson plans, and even in-person interactions for students in homes or classrooms. Flipped learning, including online learning has been attracting as an alternative teaching and learning method for university education (Chun, & Heo, 2018); and Sullivan, Hillaire, Larke, & Reich (2020) indicate that *Teacher Moments* as an open-source resource for teacher educators may be used to create digital clinical simulations, as well as demonstrate the utility of the system for surfacing student perspectives which, in turn, provides opportunities for deeper discussion and reflection. Lowenthal, Borup, West, & Archambault (2020) found out that as a result of COVID-19, many faculties opted to transition their courses to live synchronous web meetings using web conferencing tools like Zoom to support online effective teaching and learning during the pandemic; meanwhile, According to Umek, Aristovnik, Tomaževic, & Keržic (2015) the use of e-learning techniques in higher education is becoming ever more frequent, and in some institutions, e-learning has completely replaced the traditional teaching methods, while in others it supplements classical courses. Rasmitadila et al. (2020) found four main themes, namely, instructional strategies, challenges, support, and motivation of teachers that contribute to the enhancement of online collaborative learning between teachers, parents, and schools that impact student success; as well as Mulenga, & Marbán, (2020) indicate that prospective teachers with low scores are more likely to exhibit low skill levels in the use of mobile technology and the adoption of social media concerning mathematics

pedagogy during the COVID-19 crisis, however, digital learning could be a positive response to COVID-19 closure period. So, strategies of effective teaching' variable is considered an important one that impacts online learning. Therefore, it is hypothesized that:

H # 1: There is a positive relationship between the strategies of effective teaching and online learning.

The relationship between technology using and online learning

The technology using variable is supposed to influence online learning. A lot of authors have researched to investigate the association between the strategies of effective teaching and online learning, especially during the pandemic outbreak.

The orientation of students to online learning environment where digital technology is used, have been important to enhance online learning and improve student satisfaction (Brown, Schroeder, & Eaton, 2016; Boz, & Adnan, 2017); meanwhile, Wahab (2020) reveals that universities worldwide are moving more and more towards online learning or E-Learning and that apart from resources, staff readiness, confidence, student accessibility, and motivation play an important function in ICT integrated learning. Sasaki et al. (2020) revealed that viability of a technology-based simulated classroom to support the practicum experience of Initial Teacher Education students, now particularly during the Covid-19 pandemic; and Montacute (2020) found that online tuition, both during and after the school closures, as well as ensuring access to technology and online resources for students from disadvantaged backgrounds while schools are closed help to minimize the impact on the attainment gap, as well as enhance effective strategies of teaching and learning. Grantmakers for Education(2020)report that COVID-19 has impacted the teaching and learning, and the use of technology may help to minimize its effect on effective online teaching, as well as on students' progress ; meanwhile, Online learning, including using of digital technology influence perceived learning (Gray, &DiLoreto, 2016; Ashford, 2014); meanwhile, Cakir, Karademir, &Erdogdu (2018) revealed a significant correlation between the students' motivation and their online learning experiences; and Barry, & Kanematsu (2020) emphasize that using the digital technology during the pandemic may serve to enhance one's teaching experiences as well as students' learning during at university.

Daubney, & Fautley (2020) discusses that schools and teachers have had to make a sudden shift to a largely on-line modality of teaching, and the use of such teaching support the online learning of students; as well as Flores, Walters, &Kiekel (2018) showed three main themes related to interactions with students, online successes and failures, and online teaching influences, and recognizing the importance of holistic distance education, online academic instruction in secondary virtual schools help to create safe academic spaces for all students and educators alike. Burnett (2018)indicated that providing reading instruction in print and online, as well as facilitating conversations about the text, providing opportunities for instruction and practice of close reading strategies, writing responses to text, and taking practice assessments can build the deep reading skills necessary for success in reading deeply and testing in online formats; meanwhile, Shivangi (2020) reports that pandemic situation challenged the education system across the world and forced educators to shift to an online mode of teaching, and this pedagogical approach support effective teaching and students 'learning . Hence, technology using is considered an important variable that influences online learning. Therefore, it is hypothesized that:

H # 2: There is a positive relationship between technology using and online learning.

Methodology

Method and design

The quantitative approach was the method used in the research. The design of the study employed a sample of 90 social sciences students. Strategies of effective teaching and technology using were chosen to be used as independent variables. Meanwhile, online learning was selected to be used as a Dependent variable.Strategies of effective teaching and technology using as independent variables have five measurement levels: 1= Never using, 2= Rarely using, 3= Sometimes using; 4= Often using, 5= Always using. Online learning from the other side has also five measurement levels: 1= Very low level, 2= Low level, 3= Medium level, 4= High level, 5= Very high level.

Sample and data collection

A non-random sample of 90 social sciences students was selected to be investigated in the research. The sample of respondents is composed of 48 females (53.3%), and 42 (46.7%) males. A structured questionnaire was used to gather the primary data from the students in the 2019-2020 academic year, in the pandemic outbreak period. The questionnaire is based on *Educational Technology Integration Questionnaire*-an instrument to assess the technology used in the teaching (Yemothy, 2015), and is modified, piloted, and validated by the author.

Analysis

A descriptive statistic, as well as a bivariate correlation statistic were used for the processing of data collected by research instrument. The relationship between strategies of effective teaching, technology using online learning was investigated using the Pearson correlation coefficient. Linear multiple regression was used to assess the skills of five control measures to online learning levels by strategies of effective teaching, and technology using. Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity, with no violations noted.

Results and discussion

Descriptive Statistics

Strategies of effective teaching

Table 1: Strategies of effective teaching frequencies

Strategies of effective teaching				
	Frequency	Percent	Valid Percent	Cumulative Percent
	Never	16	17.8	17.8
	Rarely	43	47.8	65.6
Valid	Sometimes	20	22.2	87.8
	Always	11	12.2	100.0
	Total	90	100.0	100.0

Strategies of effective teaching frequencies indicate that 17.8% of the students claim that lecturers have never used strategies of effective teaching during the COVID-19; 47.8% of the respondents claim rarely; 22% of them some times, and 12.2% of them claim that lecturers have always used strategies of effective teaching during the COVID-19. Central tendency values for students ($M= 2.41$, $SD = 1.16$) indicate the same tendency for values as measured by frequencies. Hence, the major number of students (47.8%) claim that strategies of effective teaching have been used rarely, meanwhile, 44.6% of them claim that strategies of effective teaching have been used sometimes or always. Therefore, according to the students, the frequency of using strategies of effective teaching has not been at the required level to support the online learning of students during COVID- 19.

Technology using

Table 2: Technology using frequencies

Technology using				
	Frequency	Percent	Valid Percent	Cumulative Percent
	Never	12	13.3	13.3
	Rarely	44	48.9	62.2
Valid	Sometimes	14	15.6	77.8
	Frequently	17	18.9	96.7
	Always	3	3.3	100.0
	Total	90	100.0	100.0

Technology using frequencies indicate that 13.3% of the students claim that lecturers have never used technology productively during the COVID-19; 48.9 of the respondents claim rarely; 15.6% of them sometimes, 18.9% frequently, and 3.3% of them claim that lecturers have always used technology productively during the COVID-19. Central tendency values for students ($M= 2.50$, $SD = 1.05$) indicate the same tendency for values as measured by frequencies. Hence, the major number of students (48.9%) claim that lecturers have rarely used technology in a productive way, meanwhile, 22.2% of them claim that lecturers have frequently or always used technology in productively way. Therefore, according to the students, the frequency of using technology in a productive way has not been at the required level to support the online learning of students during COVID- 19.

Online learning

Table 3: Online learning frequencies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very low level	17	18.9	18.9	18.9
	Low level	28	31.1	31.1	50.0
	Medium level	19	21.1	21.1	71.1
	High level	20	22.2	22.2	93.3
	Very high level	6	6.7	6.7	100.0
	Total	90	100.0	100.0	

Online learning frequencies indicate that 18.9% of the students claim that there is a very low level of online learning during COVID-19 period; 31.1% of them claim low level; 21.1% medium level; 22.2% high level, and 6.7% of them claim that there is a very high level of online learning during COVID-19 period.

Central tendency values for students ($M= 2.66$, $SD = 1.20$) indicate the same tendency for values as measured by frequencies. So, 50% of the students claim that there is a very low or low level of online learning during COVID-19; 28.9% of them claim that there is a high or very high level; meanwhile, 21.1% of them claim that there is a medium level of learning. Therefore, half of the respondents report the very low or low level of online learning during COVID-19; meanwhile, the other half report medium, high, or very high level of online learning during the COVID-19 period.

Inferential Statistics

Table 4: Pearson correlations outputs of the relationships between strategies of effective teaching and online learning variables

Correlations			
		Online learning	Strategies of effective teaching
Pearson Correlation	Online learning	1.000	.564
	Strategies of effective teaching	.564	1.000
Sig. (1-tailed)	Online learning	.	.000
	Strategies of effective teaching	.000	.
N	Online learning	90	90

Strategies of effective teaching of 90 90

As shown in Table 4, according to students, there is a high positive correlation between strategies of effective teaching and online learning variables, $r = .564$, $n = 90$, $p < .005$. Hence, high scores of strategies of effective teaching approach are associated with high scores of online learning, according to students.

Table 5: Regression outputs of the relationships between strategies of effective teaching and online learning variables

Model Summary										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. Change	F
1	.564 ^a	.318	.310	1.00399	.318	40.968	1	88	.000	

a. Predictors: (Constant), Strategies of effective teaching

As shown in Table 5, the total variance of online learning levels explained by strategies of effective teaching (the model) is 31.8%, $F(1, 1.003)$, $p < .005$ according to students. The model reaches statistical significance (Sig. = .000; this means $p < .0005$). The F value, that is the ratio of the mean regression sum of squares- an estimate of population variance that accounts for the degrees of freedom indicates that the null hypothesis is false (regression coefficients are different from zero).

Table 6: Beta Standardized Coefficients of the relationships between strategies of effective teaching and online learning variables

Coefficients^a										
Model		Unstandardized Coefficients		Standardized Coefficients	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error			Lower Bound	Upper Bound	Zero-order	Partial	Partial
	(Constant)	1.251	.245	.5102	.000	.764	1.738			
1	Strategies of effective teaching	.587	.092	.564	.000	.405	.769	.564	.564	.564

a. Dependent Variable: Online learning

According to students, as shown in Table 6, the beta value for online learning is .564. The result means that according to students 56.4% of the variance on online learning is explained by strategies of effective teaching. Hence, a considerable percentage of variance on online learning is explained by strategies of effective teaching according to students. In conclusion, based on the statistical outputs shown above, H_1 : There is a positive relationship between the strategies of effective teaching and online learning, is supported.

Table 7: Pearson correlations (r) outputs of the relationships between technology using and online learning variables

Correlations			
		Online learning	Technology using
Pearson Correlation	Online learning	1.000	.884
	Technology using	.884	1.000
Sig. (1-tailed)	Online learning	.	.000

	Technology using	.000	.
N	Online learning	90	90
	Technology using	90	90

As shown in Table 7, according to students, there is a very high positive correlation between technology using and online learning variables, $r = .884$, $n = 90$, $p < .005$. Hence, high scores of technologies using approach are associated with high scores of online learning, according to students.

Table 8: Regression outputs of the relationships between technology using and online learning variables

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. Change	F
1	.884 ^a	.781	.778	.56886	.781	313.725	1	88	.000	

a. Predictors: (Constant), Technology using

As shown in Table 8, the total variance of online learning levels explained by technology using (the model) is 78.1%, $F(1, .568)$, $p < .005$ according to students. The model reaches statistical significance (Sig. = .000; this means $p < .0005$). The F value, that is the ratio of the mean regression sum of squares- an estimate of population variance that accounts for the degrees of freedom indicates that the null hypothesis is false (regression coefficients are different from zero).

Table 9: Beta Standardized Coefficients of the relationships between technology using and online learning variables

Coefficients^a

Model	Unstandardized Coefficients	Standard Error	Standardized Coefficients	Sig.	95.0% Confidence Interval for B		Correlations			
					Lower Bound	Upper Bound	Zero-order	Partial	Part	
	B	Std. Error	Beta							
(Constant)	.129	.155		.828	.410	-.180	.437			
1	Technology using	1.015	.057	.884	17.712	.000	.901	1.129	.884	.884

a. Dependent Variable: Online learning

According to students, as shown in Table 9, the beta value for online learning is .884. The result means that according to students 88.4% of the variance on online learning is explained by technology using. Hence, a very high percentage of variance on online learning is explained by technology using according to students. In conclusion, based on the statistical outputs shown above, H_2 : There is a positive relationship between technology using and online learning, is supported.

Conclusion and implications

One main limitation of the study should be acknowledged as part of the conclusions. The measurement of the by strategies of effective teaching, technology using, and online learning is made based on self-reported instruments. The purpose of the study was to investigate the relationships between the strategies of effective teaching, technology using, and online learning, as well as the influence of the effective teaching and technology using on online learning. The prior assumption was that there is an impact of effective teaching and technology using on online learning. The study found that, according to the major number of students (47.8%), strategies of effective teaching have been used rarely, meanwhile, 44.6% of them reported that strategies of effective teaching have been used sometimes or always. It is also revealed that lecturers have rarely used technology in a productive way, according to the major number of students (48.9%); meanwhile, 22.2% of them reported that lecturers have

frequently or always used technology in productively way. It is demonstrated that there is a very low or low level of online learning during COVID-19, according to 50% of the students; 28.9% of them reported that there is high or very high level; meanwhile, 21.1% of them claim that there is a medium level of online learning. Therefore, the faculties should promote strategies of effective teaching, and technology using in online learning, especially during the pandemic outbreak.

It is revealed a high positive correlation between strategies of effective teaching and online learning variables ($r = .564$). The study also found out that the total variance of online learning levels explained by strategies of effective teaching (the model) is 31.8%, according to the students. It is demonstrated that, according to the students, 56.4% of the variance on online learning is explained by strategies of effective teaching. The study found that, according to the students, there is a very high positive correlation between technology using and online learning variables ($r = .884$). It is also revealed that the total variance of online learning levels explained by technology using (the model) is 78.1%, according to students. The study demonstrated that, according to the students, 88.4% of the variance on online learning is explained by technology using. Therefore, the faculties should promote strategies of effective teaching, and technology using, as important variables that impact online learning, especially during COVID-19. At the same time, the faculties should also propose online and remote learning as a necessity in times of lockdowns and social distancing due to the COVID-19 pandemic. Overall, the findings of this study enhanced theoretical and practical understanding as to the strategies of effective teaching, and technology using are important variables that influence online learning, especially during the exceptional times.

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