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Covid-19 and Virtual Classroom: The Effect on Motivation of UiTM Puncak Perdana Students

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Abstract. The COVID-19 pandemic has spread around the world and has had a major impact on all universities, especially UiTM Puncak Perdana. This study would like to determine the students' motivation about virtual classrooms, which focuses on postgraduate students at the Faculty of Information Management, UiTM Puncak Perdana. This research is aimed to determine whether use of virtual classrooms application at postgraduate UITM Puncak Perdana level leads to affect students' motivation in the field of learning. This paper proposes a framework to determine three categories concerning the perspective on student motivation using virtual classrooms. As a result, the study reveals that the perspective on student motivation using virtual classrooms consists of learning design perspective, learner trait perspective and situational perspective. This paper also shows the table analysis of review and the figure proposed in the research framework. The quantitative approach and questionnaire instrument are the research methodology and technique used to investigate this phenomenon. Thus, this study is hoped to give a crystal clear understanding of the Covid-19 and virtual classroom affect the student motivation by postgraduate student of UiTM Puncak Perdana.
Keyword: Covid-19, Virtual Classroom, Student Motivation, Postgraduate Student, UiTM, learning design perspective, learner trait perspective, situational perspective

1 Introduction

The emergence of the COVID-19 epidemic caused many changes in the traditional way of doing their operation to digital evolution. Institutions of higher learning are not left behind and the closure of universities is not planned because of this pandemic. No one saw the epidemic coming but even though it caused physical closure suddenly, the learning process had to continue. The university is asked to continue digital service during the closing period when the physical building is closed. Therefore, the introduction of COVID-19 aims to ensure that universities continue to offer services to support virtual classrooms.

Due to its convenience, virtual classrooms have grown rapidly in the last decade. According to Tsekea and Chigwada (2020), virtual classrooms are digital learning environments that allow lecturers and students to communicate online in real time with endless complexities such as online video conferencing, online whiteboards and screen sharing to enable educators to have live discussions, virtual office hours, interactive environments and student discussion. As the Covid-19 epidemic spread, virtual classrooms had a major impact on education in Malaysia. Lecturers and students are transforming from traditional learning into this virtual classroom. The strength of student learning assessment using virtual classrooms has a strong impact and generally gives a positive reaction. Although virtual classrooms have a good effect on continuous learning, they also have their own disadvantages.

The use of technology in higher education has led to some radical changes in the dynamics of learning especially during the Covid-19 situation pandemic. This is mainly facilitated by virtual classes, which involve the use of technology to enhance educational and training activities. The system of formal education in which students will become residents on campus undergoing formal classroom lectures has changed. Using virtual classroom as a medium during pandemic Covid-19, there are a lot of issues facing lecturers and students. This is because they are struggling and suffering whether in lower internet connection and limited internet coverage area in the continuing learning process during this pandemic. However, this hard situation needs universities and libraries to take an intention of this issue. This study wants to figure out student performance toward virtual classroom application among UiTM Puncak Perdana students. The role of universities, faculty, lecturers and students also need to be addressed in these issues.

Virtual Classroom

In virtual classrooms, the development of IT and internet technology is fundamental. For students and teachers, there is no time, location, distance, and it is easier to get more information from the internet interaction of students and lecturers. Today, the application of digital technology in learning, including distance, web, open, versatile, mixed, flipped, mixed and MOOCs, is defined in many words (Massive Open Online Courses). Bullen and Janes (2006) have conceptualized the continuum of the use of technology ranging from face to face to help to understand this terminology. Virtual classroom is a general term used to describe something that integrates digital technology into the learning process in this spectrum (Nichols, 2008).

In distance education, virtual classrooms have their origins. Bates (2005), shows that the words 'virtual classroom' and 'e-learning' are used interchangeably, but makes the difference that e-learning can encompass all types of technology, whereas online learning explicitly refers to the use of the internet and the internet. There are many meanings of virtual classrooms that reflect the various activities and technologies used that describe the use of the internet to access materials, to interact with content, teachers and other students, and receive help during the learning process to acquire knowledge, create personal meaning and enhance personal meaning (Ally, 2008). Bates (2005) mentioned that he uses the phrase "fully online" to distinguish long

distance courses where students must have access to an internet-enabled computer to attend the course.

During the Covid-19 pandemic, virtual classrooms became commonplace and popular among educational students. Virtual classrooms, according to Racheva (2018), are when students and lecturers are involved in an online learning environment that allows the learning process to continue with direct interaction between students and lecturers. Meanwhile, Yan and Song (2013) state that virtual classrooms are effective in ensuring justice in education, especially for those who are poor or living in remote areas, or who do not have regular time to go to school. In other words, the virtual classroom mentioned here is considered to be a type of distance learning mediated by technical instruments in which students are geographically separated from teachers and major institutions.

Motivation

The mechanism by which initiating, directing, and maintaining goal-oriented behavior is motivation. If you drink a glass of water to reduce hunger or read a book to get information, this is what motivates you to act. As stated by Brophy (2010), he defines motivation as "the theoretical construct to explain initiation, direction, intensity, persistence, and quality of behavior, especially behavior directed toward purpose,". The biological, emotional, social, and cognitive forces that trigger behavior are involved in motivation. The word "motivation" is often used in everyday usage to explain why someone is doing something because of the driving force behind human action. Activity is an important part of motivation, whether physical or emotional. The notion that motivation is a mechanism rather than an end product implied in this concept. In terms of motivation calculations, this has an effect because it cannot be explicitly tested, it should be inferred from behaviors such as job choices, persistence, initiative and success, or from what people say about themselves (Schunk, et al., 2014).

Characteristics of freedom, self-direction and intrinsic motivation have long been associated with distance learning, according to Moore (1989). As an important feature of virtual classroom students, intrinsic motivation has also been formed. Intrinsic motivation occurs for behavior driven by internal gain. In other words, the incentive to participate in behavior comes from within the individual because only that individual is of course satisfied with it. Lee et al (2013) pointed out recent concerns about the declining rate of online courses, especially the need for a greater understanding of the complexity of factors influencing motivation to learn in an online context in new technological environments such as MOOCs.

Findings from comparative research between virtual classroom students at the postgraduate level are more intrinsically inspired. Digital classrooms have been flooded with technological problems during the Covid-19 pandemic and can also minimize intrinsic motivation. Although significant factors are students 'intrinsic motivation, contemporary research studies investigating motivation in this environment are limited in terms of number and scope (Bekele, 2010).

2 Literature Review

This study is aimed to determine whether use of virtual classrooms application at postgraduate UITM Puncak Perdana level leads to affect students' motivation in the field of learning. The student motivation perspective of virtual classroom learning were learning design perspective, learner trait perspective and situational perspective. The first perspective used is to focus on environmental architecture to evoke student motivation. Several educational design models have been presented, some of which recognize student motivation as part of a broader approach to design and others focus only on motivation (Chan & Ahern, 1999). Besides, common strategy for researching motivation is to conceptualize different motivational constructs as attributes or characteristics of students. Instead, other studies have sought to classify features that predict student performance (Yukselturk & Bulut, 2007). According to Turner & Patrick (2008), although the number is less, studies have been done that consider the perspective of 'people in context' more contemporary.

Motivation from Perspective of Learning Design

When exploring motivation in a virtual classroom environment, the first perspective used is to focus on environmental architecture to evoke student motivation. Several educational design models have been presented, some of which recognize student motivation as part of a broader approach to design and others focus only on motivation (Chan & Ahern, 1999).

The ARCS Keller model is the most widely used instructional design method for planning and empowering an online learning environment. This structure was developed using a systematic approach to instructional design as a way of shaping student motivation. The categories of attention, relevance, trust and satisfaction (ARCS) serve as guidelines for creating systematic educational strategies that engage students, assess the relevance of what is taught, cultivate student confidence, and provide a sense of satisfaction through intrinsic and extrinsic rewards (Keller, 2010). In enhancing our understanding of motivation in an online learning environment, several types of instructional design approaches are essential. However, to clarify the dynamic processes that occur because they often do not take into account student variation, such processes are inadequate.

Motivation from a Learner Trait Perspective

The second and common strategy for researching motivation is to conceptualize different motivational constructs as attributes or characteristics of students. The motivation for much of this research is to seek to determine the variables that lead to higher friction rates (Lee, et al., 2013). Instead, other studies have sought to classify features that predict student performance (Yukselturk & Bulut, 2007). Moos and Marroquin (2010) argue that basic and sustainable motivation theory can direct

research to investigate motivation in a technology-rich environment. That includes the theory of self-efficacy, goal orientation, interest theory, and the theory of intrinsic-extrinsic motivation. Of these, the principle of self-efficacy was used most commonly. Motivation from learner perspective where self-efficacy, goal orientation, interest, intrinsic – extrinsic motivation.

Bandura's (1986) social cognitive theory is fundamental to this field of motivational study. This is based on the idea that personal factors, attitudes, and environmental effects have reciprocal interactive relationships. To evaluate self-efficacy, individuals use knowledge from a variety of sources. Goal orientation theory discusses why students participate in achievement behaviors, especially assumptions that result in a variety of approaches and involvement in achievement situations (Murayama, et al., 2012). Students who follow the learning target orientation tend to focus on learning to understand, acquire new skills, and strengthen or develop skills where the criteria for measuring achievement or otherwise are essential for students. Interest is a term that has been defined in many ways, but is most often seen as a psychological condition involving focused attention, improved cognitive function, persistence and affective participation (Hidi, 2000). “Intrinsic motivation is defined as the performance of an activity for inherent satisfaction and not for separable results” (Ryan & Deci, 2000). A person’s challenges, interests or pleasures derived from activities also produce intrinsic motivation. "Extrinsic motivation, on the other hand, is the construct that occurs whenever an activity is performed to achieve separable results" (Ryan & Deci, 2000a, p. 60).

Motivation From a Situational Perspective

According to Turner & Patrick (2008), although the number is less, studies have been done that consider the perspective of ‘people in context’ more contemporary. Using the principle of goal orientation, Matuga (2009) found that, within the framework of online science courses, goal orientation moves from success to learning orientation over time. Xie et al. (2006) identified contextual factors that increase students ’intrinsic motivation, such as clearly stated instructions, well-planned discussion topics and teacher participation and that reduced them, such as lack of input from teachers and peers.

For example during Covid-19, using self-efficacy theory, the reception of detailed and timely feedback increases students' self-efficacy dramatically. Collective effectiveness, the general expectation of people in their collective strength to achieve desired results, is a related concept that has been proven to have a positive impact on conversational activities and group success in a computer-assisted interactive learning environment. Whipp and Chiarelli (2004) found in a similar study that teacher support, peer support and course design influence student interest in web-based courses.

Past works on investigating to determine whether use of virtual classrooms application at postgraduate UITM Puncak Perdana level leads to affect students' motivation in the field of learning via the following proposed framework as shown in Figure 1.

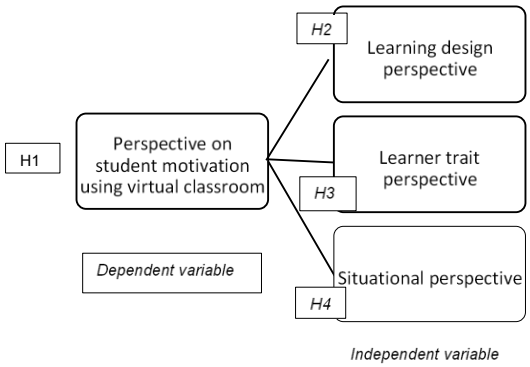

Fig. 1 Proposed research framework

In Figure 1 the proposed research framework based on the discussion in the literature reviews is presented. The hypotheses generated are as follow:

H1: There is a relationship between virtual classroom and students' motivation
H2: Perspective on student motivation using virtual classroom has a significant impact on learning design perspective
H3: Perspective on student motivation using virtual classroom has a significant impact on learner trait perspective
H4: Perspective on student motivation using virtual classroom has a significant impact on situational perspective

3. Methodology

Sekaran & Bougie (2010) claim that the next action is to create a research design, once the research theory structure is completed. This study is conducted using quantitative method by distributing questionnaires survey to respected respondents. UiTM Puncak Perdana one of university that have been used virtual classroom as a tool for teaching and learning to provide the education process during covid-19 era. Postgraduate students from the Faculty of Information Management at UITM Puncak Perdana will be involved in sampling the population of this study. The 150 research questionnaire will be distributed to the population of this study. The researcher will disseminate the research questionnaire directly to the postgraduate students in UiTM Puncak Perdana via Google Form. This study is aimed to determine whether use of virtual classrooms application at postgraduate UITM Puncak Perdana level leads to affect students' motivation in the field of learning.

4. Result and Discussion

Descriptive Statistics

In this section, several tests will be carried out to test the demographic profile and the variables conducted based on the percentage. There will be five questions for the demographic profile addressed here, including age, gender, programmed code, study mode and ever they enjoy study via virtual classroom. Table1 below shows the descriptive statistics on the demographic profile for this study.

Table 1. Descriptive Statistics on Demographic Profile

Variables		Frequency (N=150)	Per cent (%)
Age	23 years old – 30 years old	132	88.0
	31 years old and above	18	12.0
Gender	Male	44	29.3
	Female	106	70.7
Programmed code	Master of Science In Knowledge Management - IM701	22	14.7
	Master of Science In Information Management - IM770	61	40.7
	Master In Library Science - IM772	15	10.0
	Master of Science in Records and Documents Management - IM773	28	12.0
	Master of Science in Information System Management - IM775	22	14.0
	Master of Science Information Management by Research - IM750	12	8.0
Study mode	Full time	110	73.3
	Part time	40	26.7
Did you enjoy studying via virtual classroom?	Yes	116	77.3
	Maybe	28	18.7
	No	6	4.0

In table 1 above, the results show that the highest frequency of 150 respondents is between 23 years old – 30 years old, with a frequency of 132 respondents, which shows 88%. Furthermore, the study results found for respondents aged 31 years old and above recorded 18 respondents with a valid percentage of only 12%.

The findings showed that the main gender answering the questionnaire was female, with 106 respondents showing 70.7%. On the other hand, 44 respondents, with 29.3%, were male respondents who answered the questions.

Based on the results of the study, the most participated in the study reveals from programmed Master of Science in Information Management - IM770, which is has a frequency of 61 respondents and the percentage is 40.7%. On the other hand, followed by two programmed which are Master of Science in Knowledge Management - IM701 and Master of Science in Information System Management - IM775 that recorded the same frequency of 22 which is 14.7%. Next, the findings for Master of Science in Records and Documents Management - IM773 recorded with a frequency 18, which is 12%. Meanwhile, the programmed Master In Library Science - IM772 got the findings, which are frequency 15, which is 10%.

Based on the findings, the most participated in the study is from full time students with a frequency of 110, which is 73.3% and followed by part time students, with a frequency of 40, which is a percentage of 26.7%.

The findings of the respondent's whether they are enjoying study via virtual classroom. There are 3 answer options provided in the research questions: yes, maybe and no. Based on the findings, the result record that most of respondent's in the study is answered yes with a frequency of 116, which is 77.3% and followed by maybe answered, with a frequency of 28, which is a percentage of 18.7%. Next, the lowest findings for no with a frequency 6, which is 4%.

Normality Test

The normality test is the importance of this test is to acquire better understanding on sample collection between an applicable range including its skewness. For the abnormal sample distribution, additional tests are carried out using non-parametric technique while normal sample distribution will result in the usage of parametric technique for further tests. For this study, the data samples collected are analyzed and the Mean, Standard Deviation, Skewness, and Kurtosis of each item is shown on the table below.

Table 2. The Mean, Standard Deviation, Skewness and Kurtosis of each item

Construct	Item	Mean	Std. Deviation	Skewness	Kurtosis
B - Individual factor	B1	4.45	.701	-1.136	.870
	B2	3.91	.698	-.230	-.070
	B3	4.10	.841	-.603	-.361
	B4	3.85	.784	-.232	-.392
	B5	3.94	.796	-.215	-.677
	B6	3.95	.826	-.335	-.560
	B7	3.80	.819	-.208	-.512
	B8	3.79	.854	-.835	1.513
C - Effective ways to motivate students via virtual classroom	C1	4.25	.770	-.917	1.105
	C2	3.71	.822	-.084	-.208
	C3	4.01	.819	-.470	-.362
	C4	3.93	.778	-.478	.493
	C5	3.88	.741	-.105	-.516
	C6	3.96	.834	-.276	-.767
	C7	3.84	.795	-.111	-.643
	C8	3.87	.830	-.187	-.716
	C9	3.90	.730	-.157	-.396
	C10	3.89	.848	-.183	-.825
	C11	3.91	.802	-.237	-.590
	C12	3.89	.697	-.094	-.359
D - Student motivation perspective toward virtual classroom	D1	4.13	.846	-.582	-.536
	D2	3.66	.693	.081	-.321
	D3	3.82	.795	-.153	-.534
	D4	3.800	.7597	-.019	-.583
	D5	3.93	.833	-.157	-.945
	D6	3.87	.800	-.233	-.494
	D7	3.85	.736	.034	-.715
	D8	3.67	.746	-.171	.328
	D9	3.90	.809	-.200	-.664
	D10	3.70	.721	.087	-.435
	D11	3.81	.870	-.185	-.757
	D12	3.77	.761	-.333	-.073
E - Effectiveness student motivation in learning process	E1	4.27	.802	-1.011	1.046
	E2	3.77	.752	-.271	.394
	E3	3.97	.827	-.455	-.349
	E4	3.78	.722	.143	-.674
	E5	3.93	.743	-.081	-.698
	E6	3.87	.788	-.271	-.381
	E7	3.92	.773	-.126	-.717

Based on Table 2, the variable individual factor with highest mean is B1 with the value of 4.45 while the variable with the lowest mean is B8 with the mean value of

3.79. The variable with the highest skewness is B1 with the skewness value of -1.136 while the lowest is B7 with the skewness value of -0.208. These construct variables are normally distributed due to its kurtosis from B1 to B8 are within normal range which is between -2 to 2.

The effective way to motivate students via virtual classroom, C1 has the greatest mean value which is 4.25 while the lowest mean value is C2 with the value of 3.71. The highest skewness of the construct is C1 with the value of -0.971 while the lowest skewness is C2 with the value of -0.084. The variables of the construct are normally distributed. These can be determined by their kurtosis value that is within the range of -2 to 2.

Third construct which is the student motivation perspective towards virtual classrooms, the highest mean can be observed at D1 with the mean value of 4.13 while the lowest mean variable is D2 with mean value of 3.66. The greatest skewness value for the construct is D12 with the skewness value of -0.333 while the lowest skewness is D4 with the skewness value of -0.019. The construct variables are normally distributed due to its kurtosis values being within the normal range which is -2 to 2.

The effectiveness of student motivation in the learning process, the mean, skewness, and kurtosis are as follows. The variable with the highest mean is E1 with the mean value of 4.27 while the variable with the lowest mean is E2 with mean value of 3.77. The variable with the highest skewness is E1 with the value of -1.011 while the variable with the lowest skewness value is E5 with the skewness value of -0.081. We can assume that this variable construct is normally distributed due to its kurtosis value throughout the variables that are within the range of normal distributed variables which is -2 to 2.

Following the kurtosis value of the data, all of the kurtosis values of the items are within the range of normal distribution; hence, the next analysis will be carried out using a parametric method.

Reliability Test

The scale's internal consistency can be checked by using a method called reliability test. The degree of consistency can be obtained by using Cronbach's alpha coefficient as an indicator for the degree of consistency. All constructs and variables must have the Cronbach's alpha above 0.6. The ideal Cronbach's alpha should be above 0.7 but due to this study evaluating student's behavior, the Cronbach's alpha coefficient scale can be accepted with the value of 0.6 and above according to Nunnally (1967). Hence, the Cronbach's alpha used in this study is set to 0.6.

Table 3. Summary of the Cronbach's alpha for each construct

	Construct	Cronbach's alpha	No.of items
B	Individual factor	0.723	8
C	Effective ways to motivate students via virtual classroom	0.819	12
D	Student motivation perspective towards virtual classroom	0.796	12
E	Effectiveness of student motivation in learning process	0.762	8

From the above summary, all the variables have a Cronbach's alpha coefficient of above 0.6. Hence, we can conclude that all the items in this study are consistent and reliable.

Validity Test

Validity test is carried out using factor analysis to obtain the output of the results. Factor analysis can be used to reduce or summarize using smaller set of components; however, it cannot be used to test the hypothesis.

Table 4. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.825
Bartlett's Test of Sphericity	Approx. Chi-Square	891.865
	df	190
	Sig.	.000

There are 20 items for study effectiveness were submitted to principe components analysis (PCA) using SPSS. The coefficient was fixed at 0.3 for this analysis. The Kaiser-Meyer-Olkim (KMO) value obtained is 0.825 which is greater than approved value of 0.6 while the Bartlett's Test of Sphericity value is lower than 0.05, which indicates that it reaches statistical significance.

Correlation Analysis

The correlations coefficient of four variables were tested through Pearson's product-moment correlation and the level of significance for all correlation coefficients set at the 0.05 level which is 2-tailed.Pearson's correlation (r) defines the relationship strength of the variables. When the r value is 0, it indicates that there is no relationship between two variables while when the r value is 1, it indicates that the correlation value is the perfect positive correlation. Meanwhile when the r value is -1, it can be

interpreted as a negative correlation of the variables. According to a study of Cohen (1988), the value of r can interpret the relationship strength of the variables.

Table 5. Pearson's Product - Moment of Correlation Matrix

	B	C	D	E
B	1			
C	.504	1		
D	.490	.749	1	
E	.550	.588	.571	1

Table 6. Summary of Status of Hypotheses

Hypotheses	Status	Conclusion
H1	Supported	There is a significant relationship between virtual classroom and student motivation.
H2	Supported	There is a significant relationship between virtual classroom and learning design perspective.
H3	Supported	There is a significant relationship between virtual classroom and learner trait perspective.
H4	Supported	There is a significant relationship between virtual classroom and situational perspective.

Based on table 5 and 6 there are significant relationship between correlation and hypotheses status. The relationship between virtual classrooms and students' motivation shows a large strength with a positive correlation ($r=0.550$, $p<0.01$). The correlation analysis supports that virtual classrooms have a relationship with the students' motivation. Therefore, H1 is supported. From the above table of correlation matrix, it shows a large strength relationship between student motivation using virtual classroom and learning design perspective with a positive correlation value ($r=0.740$, $p<0.01$). the correlation analysis supports that perspective on student motivation using virtual classrooms has a significant impact on learning design perspective; hence, H2 is supported. Based on the above table 4.15, the perspective on student motivation using virtual classrooms has a medium strength relationship to impact on learner trait

perspective with the value ($r=0.49$, $p<0.01$). The analysis of correlation supports that perspective on student motivation using virtual classrooms has a significant impact on learner trait perspective. Hence, H3 is supported. From the above table 4.15, it shows a large relationship strength between perspective on student motivation using virtual classroom and impact on situational perspective with the value ($r=0.571$, $p<0.01$). Thus, the correlation analysis supports perspective on student motivation using virtual classrooms has a significant impact on situational perspective. Hence, H4 is supported.

5. Conclusions

As a consequence, Covid-19 and virtual classrooms was new normal phenomenon among postgraduate students in their learning process. The study found that, although there was student motivation by postgraduate students, they were able to adapt to the new era of learning methods through virtual classrooms and felt virtual classrooms were more efficient than face to face learning. While the unexpected worldwide closure of universities as a result of the COVID-19 pandemic was undesirable, it provided a huge opportunity for a cultural revolution in the education sector.

As more generations of "technology era" enter higher education in universities, lecturers must incorporate blended learning into their curriculum, combining the best aspects of the classroom and virtual classroom to improve the overall learning environment. From the results, we can conclude that the motivation of students towards virtual classrooms do affect the effectiveness of the class. The motivation on the other hand is positively related to a few factors and perspectives of the students towards virtual classrooms.

Although the data obtained from independent respondents, the data received are normally distributed so that it can be analysed parametrically. The data are tested and it shows that the data are valid and reliable. The results from the data prove that the student motivation does affect the virtual classroom effectiveness and the student motivation depends on a few aspects that are being measured in this study.

References

Ally, M. (2008). Foundations of educational theory for online learning. In The Theory and Practice of Online Learning (2nd ed., pp. 15-44). Athabasca, Alberta: Athabasca University Press. Retrieved January 9, 2009, from http://www.aupress.ca/index.php/books/120146.

Bandura, A., & National Inst of Mental Health. (1986). Social foundations of thought and action: A social cognitive theory. Prentice-Hall, Inc.

Bates, A. W. (2005). Technology, E-Learning and Distance Education. London: Routledge.

Bekele, T. (2010). Motivation and Satisfaction in Internet-Supported Learning Environments: A Review. Educational Technology & Society. 13. 116-127.

Brophy, J. (2010) Motivating Students to Learn. 3rd Edition, Routledge, Abingdon-on Thames.

Cohen, J. (1988). Statistical Power Analysis for the Behavioral Sciences (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Hidi, S. Interest, Reading, and Learning: Theoretical and Practical Considerations. Educational Psychology Review 13, 191–209 (2001). https://doi.org/10.1023/A:1016667621114

Keller, J. M. (2010). Motivational Design for Learning and Performance: The ARCS model approach. New York, NY: Springer. doi:10.1007/978-1-4419-1250-3

Matuga, J. M. (2009). Self-Regulation, Goal Orientation, and Academic Achievement of Secondary Students in Online University Courses. Educational Technology & Society, 12 (3), 4–11.

Moos, D. & Marroquin, E. (2010). Multimedia, hypermedia, and hypertext: Motivation considered and reconsidered. Computers in Human Behavior. 26. 265-276. 10.1016/j.chb.2009.11.004.

Nunnally, J.C. and Bernstein, I.H. (1994) The Assessment of Reliability. Psychometric Theory, 3, 248-292

Racheva, V. (2018). Social aspects of synchronous virtual learning environments. AIP Conference Proceedings. 2048. 020032. 10.1063/1.5082050.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist, 55(1), 68–78. https://doi.org/10.1037/0003-066X.55.1.68

Sekaran, U., & Bougie, R. (2010). Research Methods for Business: A Skill Building Approach (5th edition). New Jersey: John Wiley and Sons.

Tsekea, S & Chigwada, J. (2020). COVID-19: strategies for positioning theuniversity library in support of e-learning. Digital Library Perspectives. ahead-of-print. 10.1108/DLP-06-2020-0058.

Turner, J & Patrick, H. (2008). How Does Motivation Develop and Why Does It Change? Reframing Motivation Research. Educational Psychologist. 43. 119-131. 10.1080/00461520802178441.

Whipp, J.L., Chiarelli, S. Self-regulation in a web-based course: A case study. ETR&D 52, 5 (2004). https://doi.org/10.1007/BF02504714

Xie, Y., P. Yang, B.-C. Gao, G.W. Kattawar, and M.I. Mishchenko, 2006: Effect of ice crystal shape and effective size on snow bidirectional reflectance. J. Quant. Spectrosc. Radiat. Transfer, 100, 457-469, doi:10.1016/j.jqsrt.2005.11.056.

Yukselturk, E & Bulut, S. (2007). Predictors for Student Success in an Online Course.. Educational Technology & Society. 10. 71-83.