

Effectiveness of Online Teaching Learning Process

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Nidhi Jhavar¹ and Tarika Nandedkar¹

Abstract

Pandemics bring changes all over the world. These changes not only impact at a personal level but also at a professional level. All businesses and organizations are facing challenges of its own due to the enforced COVID-19 lockdown; so is the education sector as well. As we know that “education is key to success,” the sector designed its path during this pandemic. Online learning has become a significant tool to some extent to overcome the problem of education created during the pandemic. Every education institute, right from schools to colleges, adopted online learning. But this online learning is a very new concept in India at every level of education. This article tries to identify the effectiveness of online learning. It tries to identify whether online learning succeeds in achieving the goal of learning and mentoring of students or not. This article tries to identify whether the objective of knowledge enrichment was fulfilled with the online learning or was it just a betrayal. The article also tries to identify the factors which are very much responsible for the effectiveness of online learning. Primary data from 147 management undergraduate and postgraduate students has been used to answer all these questions. Data were analyzed with the help of Smart PLS and SPSS software. With the help of factor analysis, a total of six factors were identified which play a significant role in the effectiveness of online learning. The overall impact of all the factors on the “effectiveness of online teaching” was obtained with the help of structural equation modeling and regression analysis.

¹ IBMR, IPS Academy, Indore, Madhya Pradesh, India

Corresponding Author:

Nidhi Jhavar, IBMR, IPS Academy, Rajendra Nagar A. B. Road, Indore, Madhya Pradesh 452012, India.
E-mail: jhavarnidhi30@gmail.com



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Keywords

Education, effectiveness, online learning, pandemic, COVID-19

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Introduction

The COVID-19 pandemic shutdown did not merely affect a region or a country but the whole world. Numerous sectors such as automobile, banking, fashion and retail, transportation, etc., were adversely affected. Overnight, all the business plans were torn up; the rules were scrapped. The tactics we had learnt from the case studies were outdated and all of us were involved in real-time learning to cope up with the situation. And the impact on education was obvious. According to the World Economic Forum (Li & Lalani, 2020), COVID-19 resulted in a worldwide shutdown, and over 1.2 billion children in 186 countries were out of classrooms. The spread of COVID-19 resulted in a necessary move towards going digital because of the shutting down of colleges and schools for an unknown time period.¹ The education sector saw a significant change with the rise of e-education. All the on-campus activities were shut down and the online teaching and learning processes became the essential bustle. Going digital in all the segments was somehow an ultimate wake-up call.

The Online Education: The New Normal

Change is an inevitable concept, and a continuous learning process is the only way out to not fall behind. Education in India is a brick-to-mortar concept; that is, face-to-face interaction and lecture delivery. However, even though many institutes adopted a blended learning, a lot of institutes were rigid to go digital. The COVID-19 outbreak sparked a shift from traditional teaching to online teaching. The pandemic accelerated a change in the education system, and a supplementary tool became the new normal as schools and higher education institutes shut down till an unknown time period.

Internet did not only transform and reshape the lifestyle of our society but it also impacted the education sector enormously. In recent years, the Internet outburst and related technology came up with a potential platform to acknowledge the modern teaching methodology. Investing in the right technology at the right time and shaping the online curriculums and teaching methodologies are some of the critical decisions that need to be taken care of by the educational institutes, as post-COVID-19, the online teaching and learning processes would become the choice of a plethora of learners due to its positive aspects.

Several arguments are associated with online learning, and it is very well understood as distributed learning enabled by the Internet (Volery & Lord, 2000). Due to the sustainable advantages of online methodology over traditional teaching, it is considered to be an acceptable mode of learning for management system.

Theoretical Framework of the Study

With the rise of the Internet, the literature on online delivery of education has flourished since the early 1990s (Volery & Lord, 2000). A variety of research has been conducted to understand the concept of the online teaching and learning processes. Technological advancement has made distance education easy and approachable (McBrien et al., 2009).

Online learning is explained as a learning experience using a variety of devices such as mobile phones and laptops with Internet access. This environment of learning enables students to learn as well as interact with teachers independently from any part of the world (Singh & Thurman, 2019).

In many of the formal education contexts, teaching and learning environment is somehow similar to the traditional learning environment (Anderson, 2011). However, it involves a diverse array of tools, technological resources, physical arrangements, continuous monitoring, and support with a variety of combinations and integrations (Bates & Poole, 2003). The online learning environment has in a way become structured: learners attending live lectures, real-time interaction with instructors from any part of the universe, and instant feedback and immediate follow-up are now no more difficult (Littlefield, 2018).

Due to the spread of the virus, such online platforms for teaching and learning processes have become a much-needed tool in the education industry, where video conferencing, two-way virtual communication to keep the class organic, adequate Internet connections, connectivity not limited to laptops and desktops but accessible over the smartphones, the possibility of accession of recorded lectures, and feedback and follow-ups have become a mandatory part (Basilaia et al., 2020). However, simultaneously, universities should focus on pedagogical improvements and emphasize case-based teaching and collaborative learning through online platforms (Kim & Bonk, 2006).

With the widespread of technology all over the world in today's learning environment, finding out which methodology is better—online teaching or face-to-face interaction—is no more a concern. The ultimate aim is to derive satisfaction and a holistic development of the learner from the teaching and learning processes. Several dimensions influence the learner as well as the instructor to adopt an online mode for the teaching and learning processes. Learning outcomes of the courses that are taught, learning experiences, intrinsic and extrinsic motivation, and perception about the online learning tools that are used are considered to be the significant dimensions that influence the online mode of teaching (Kira & Saade, 2006).

Technological characteristics such as perceived usefulness, perceived ease of use of complexity, self-efficacy, and compatibility are the add-on factors that influence a positive e-learning implementation (Njenga, 2011). The information and communications technology (ICT) infrastructure along with system interaction is the technical aspect that influences e-learning implementation (Munguatasha et al., 2011). It is, therefore, essential that the designed system should be hassle-free for an effective implementation and to evade users' perception of resistance for adopting it.

Moving further, several pieces of literature argued upon the influence of the pedagogical attributes over the adoption of an e-learning structure. Users' skills

on the online system and quality of the offered content are significant attributes influencing the successful implementation of e-learning (Tarus & Gichayo, 2015). Training shall be provided to the e-learning users, especially the teachers, for quality delivery on the online platforms.

The adequate quality of e-content is directly associated with students' positive attitude towards the modern teaching system and the satisfaction derived from it (Mtebe & Raisamo, 2014). Course content delivered through the e-learning system has a direct association with its implementation for the reason that any form of learning involves course content along with teaching strategies (Khan, 2005).

The empirical research suggested that many e-learning projects failed in delivering online education due to inadequacy in considering the pedagogical dimensions when implementing it (Njenga & Fourie, 2008). So, the focus should be on e-content designing and its blend with the technological development of online teaching learning process.

Institutional characteristics such as constructive communication with stakeholders to make them understand about the used technology, administrative support, commitment, and system interactivity play a pivotal role in the implementation of the e-learning model (Rogers, 2003, pp. 2–260). Research also demonstrated that a reliable technical support from the institution's end affects the e-learning adoption rate, as it helps in building trust towards technology (Munguatosha et al., 2011). The reviews explain that in lack of institutional involvement and commitments, the e-learning execution in education stays elusive.

Learning is fun when associated with social attributes, as it reduces the feeling of isolation and provides platforms for exchanging ideas while learning. Discussion forums, chats, and collaboration over online platforms turn out to be a motivational factor amongst students and teachers to choose the e-teaching and learning process (Khan, 2005). Research conclude that e-learning leads to be challenged if not synced well with social presence. Exchange of ideas, gathering information, presenting it in a systematic manner, and discussion during online sessions are the necessities while implementing the e-learning training and workshops (Nunes & McPherson, 2007).

The study of various research concludes that different methodologies have been adopted to investigate the factors responsible for the adoption of the online teaching processes. After reviewing the various literature, the study identified certain factors such as technology acceptance, social influence, deliver content, discussions and involvement, innovation and its implementation, etc. These factors play a significant role in the implementation of online teaching learning process. However, a gap exists as the factors influencing the implementation of e-learning differ from context to context, depending upon the adopted technology and uniqueness of the learners. The present empirical study is conducted to cover the gap by identifying the factors contributing to the effectiveness of the online teaching and learning processes during an outbreak of a pandemic. The study is also an attempt to establish a relationship between identified factors and the effectiveness of online teaching. Online teaching and learning systems face numerous challenges—learners' viewpoint, educators' viewpoint, content issues, technical challenges, etc. It becomes difficult for educational institutions to engage students in the participative teaching and learning processes.

On the other hand, it is also a challenge for the teachers to shift from offline mode to online mode, changing the teaching pedagogies and moving ahead with this contemporary methodology. This piece of research also tries to develop a model to overcome the challenges of online teaching.

Research Methodology

The study is exploratory in nature and tries to find out the impacting factors of the online teaching and learning processes during the period of a crisis and pandemics such as COVID-19. Students who are taking online classes during pandemic were considered as the population of the study. With the help of a literature review done for the study, a well-structured questionnaire was constructed to collect the primary data on a 5-points Likert scale. This questionnaire was circulated online amongst the management students in Madhya Pradesh. Total 147 management undergraduate and postgraduate students participated as samples in the survey, and the data was collected for the duration from September 2020 to December 2020. Factor analysis was used to identify the factors and further regression analysis was used to find the effectiveness of these factors on online teaching. SPSS 20.0 and Smart PLS 3.3.3 was used for the analysis purpose.

Objectives of the Study

1. To identify the factors contributing for the effectiveness of online teaching and learning.
2. To establish a relationship between identified factors and effectiveness of online teaching and learning.

Hypothesis

Literature review helped to identify the items to construct the questionnaire. Further, the collected data through questionnaire were analyzed with the help of factor analysis which became the basis to construct the hypothesis as follows:

H_0 : There is no significant impact of factors “self-efficacy and cognitive engagement,” “evaluation and assessment,” “environmental characteristics,” “personalized interaction and command over the class,” “effective pedagogical attributes,” and “collaborative teaching and learning atmosphere” on the effectiveness of online classes.

Data Analysis and Interpretation

Interpretation: The value of KMO and Bartlett’s test (Table 1) obtained is 0.708, which is greater than 0.05. Also, the p -value obtained for KMO and Bartlett’s test

is .000, which is significant at a 5% level of significance; this shows the adequacy of data for factor analysis.

Interpretation: Data reduction is done with the help of factor analysis. Initially, there were total 24 items, which were reduced to total 6 factors (Table 2), namely “self-efficacy and cognitive engagement”, “evaluation and assessment”, “environmental characteristics”, “personalized interaction and command over the class”, “effective pedagogical attributes”, and “collaborative teaching learning atmosphere.” “Self-efficacy and cognitive engagement” obtained the highest factor loading, that is, 3.222.

The factor “evaluation and assessment” obtained the second highest factor loading of 3.109 The third position in factor loading was acquired by the factor “environmental characteristics,” that is, 2.329. Factors “personalized interaction and command over class” and “effective pedagogical attributes” have almost the same factor loading of 2.183 and 2.182, respectively. The last factor which is obtained with the help of factor analysis is “collaborative teaching learning atmosphere” with the factor loading of 2.156.

Interpretation: The descriptive statistics (Table 3) show the value of the mean and standard deviation of obtained factors. The mean value of effectiveness of online teaching is 4.06 on a 5-point Likert scale which can be considered as high. The mean value of factors shows that there is a variation in factors that are considered for the study. The mean value of the factor “evaluation and assessment” is 3.31 with a standard deviation (*SD*) of 0.894, which is the largest value of all means; this shows that it is the most significant factor for students. “Effective pedagogical attribute has the second largest mean value of 3.08 with an *SD* of 0.980, also showing its importance for students.

The mean value for “self-efficacy and cognitive engagement” is 2.84 with an *SD* of 0.879; for “collaborative teaching learning atmosphere,” it is 2.82 with an *SD* of 0.918; and for “personalized interaction and commands over class,” it is 2.86 with an *SD* of 0.947. The environmental factor has a mean value of 2.96 with an *SD* of 0.686.

Interpretation: Regression analysis is used to estimate the impact of derived factors on the effectiveness of online teaching. The model summary (Table 4) illustrates that the value of R^2 obtained from the regression analysis is 0.868, which provides a significant impact of 86.8% of derived factors on the

Table I. KMO and Bartlett’s Test

Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy	0.708
Approximately chi-square	589.310
Bartlett’s test of sphericity	
<i>df</i>	190
Sign	0.000

Source: SPSS calculation.

Table 2. Factor Analysis

S.No.	Items	Items Loading	Total of Items Loading	Identified Factor
1	Online classes provide more personalized interaction between teachers and students.	0.672	3.222	Self-efficacy and cognitive engagement
2	As a student, you are more focused during online classes than the physical classes.	0.669		
3	Online classes make you more responsible towards your study.	0.621		
4	Online classes make you more responsible towards time management.	0.568		
5	Online classes make real balance between theoretical and practical knowledge.	0.692		
6	Distances no bar in accessing the content.	0.494		
7	There is student engagement during online classes through modern technology, which increases the effectiveness of online classes.	0.569		
8	Monitoring is easy during online classes which increases effectiveness of online classes.	0.737	2.329	Environmental characteristics
9	Online examinations are better than the traditional ones.	0.706		
10	Appropriate assignments that increase student's interest.	0.603		
11	Online classes can be accessed after the classes through recording; it will help in better understanding.	0.37		
12	Internet plays a very crucial role in the effectiveness of online classes.	0.109		
13	Compatibility of teachers with technology impacts the effectiveness of online teaching.	0.74		
14	Sustainable electricity connections play very crucial role in online classes.	0.704		
15	Adequate bandwidth is necessary for effective online classes.	0.406		
16	Online classes provide effective communication between teachers and students. Personalized interaction.	0.761		
17	Experiencing interaction with classmate and instructor.	0.701		
18	Online classes are more effective to handle disciplinary issues. Control of teacher over the class.	0.721		
19	Online classes facilitate thoughtful discussion between teachers and students.	0.655	2.182	Effective pedagogical attributes
20	During online classes, it is easy to show videos related to subject which makes it more interesting and understandable.	0.826		
21	It is easy to share study material during online classes, which increases effectiveness of classes.	0.701		
22	Online classes are more effective than physical teaching.	0.736	2.156	Collaborative teaching learning atmosphere
23	Online classes provide comfortable learning atmosphere to teachers and students.	0.684		
24	Online classes provide effective teaching in a short span of time.	0.736		

Source: SPSS calculation.

Table 3. Descriptive Statistics

Factors	Mean	Std Deviation	N
Effectiveness of online teaching	4.06	1.276	145
Self-efficacy cognitive engagement	2.84	0.879	145
Evaluation and assessment	3.31	0.894	145
Effective pedagogical attributes	3.08	0.980	145
Collaborative teaching learning atmosphere	2.82	0.918	145
Personalized interaction and command over the class	2.86	0.947	145
Environmental characteristics	2.96	0.686	145

Source: SPSS calculation.

Table 4. Model Summary

Model	R	R-square	Adjusted R-square	Std Error of the Estimate
1	0.931 ^a	0.868	0.862	0.474

Source: SPSS calculation.

Note: ^a Dependent variable, that is, online teaching.

“effectiveness of online classes.” Also, the p -value obtained from the Table 5 is .00, which is less than .05 with an F -value of 150.719 and degree of freedom (df) of 6. Therefore, H_0 is not acceptable. Hence, the independent variables can reliably predict the dependent variables.

On the basis of the analysis, the regression model obtained for the effectiveness of online classes is as follows:

Y predicted = $-0.250 + 0.020$ self-efficacy and cognitive engagement + 0.001 evaluation and assessment + 0.078 effective pedagogical attribute + 0.085 collaborative teaching + 1.111 personalized interaction and command over the class + 0.200 environmental characteristics.

The estimation of the model shows that the amount of increase in the effectiveness of online classes that would be predicted by a 1 unit increase in the predictor, that is, a unit increase in “self-efficacy and cognitive engagement” will lead to an increase of 0.020 points in the effectiveness of online teaching. Similarly, a unit increase in “evaluation and assessment” will increase the effectiveness of online classes by 0.001. “Effective pedagogical attribute” if increased by a unit value will be an increment of 0.078 in effectiveness of online classes. “Collaborative teaching learning atmosphere” and “personalized interaction and command over the class” are the factors in which a unit increment will lead the increment of 0.085 and 1.111 points in the effectiveness of online learning. “Environmental characteristics” impacts effectiveness of online classes by 0.200 points.

It is also clear from the p -values (Table 6) that only “personalized interaction and command over the class” and “environmental characteristics” are the factors

Table 5. ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	203.402	6	33.900	150.719	0.000 ^b
Residual	31.040	138	.225		
Total	234.441	144			

Source: SPSS calculation.

Note: ^b Predictor (constants).

Table 6. Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std Error	Beta	T	
(Constant)	-0.250	0.229	-	-1.092	0.277
Self-efficacy and cognitive engagement	0.020	0.052	0.014	0.389	.698
Evaluation assessment	0.001	0.048	0.001	0.021	0.983
Effective Pedagogical Attributes	0.078	0.047	0.060	1.655	0.100
Collaborative Teaching Learning atmosphere	0.085	0.050	0.061	1.719	0.088
Personalized interaction and command over the class	1.111	0.052	0.825	21.419	0.000
Environmental characteristics	0.200	0.068	0.107	2.926	0.004

Source: SPSS calculation.

that are having a significant impact on the effectiveness of online teaching, as the *p*-values for these factors are .000 and .004, respectively, which are less than .005. On the other hand, even though each and every factor has shown a combined impact, the individual impact was not found as statistically significant.

This article tries to draw a structural equation model with the help of Smart PLS (Figure 1). Figure 1 model also interprets the same as the above. The effect of individual components obtained is much higher for the latent constraints.

The components of “self-efficacy and cognitive engagement” have an 89.5% effect on it; the components of “evaluation and assessment” have an 89% effect on it; the components of “environmental characteristics” have an 79% effect on it; the components of “personalized interaction and command over the class” have an 91.6% effect on it; the components of “effective pedagogical attributes” have 92.4% effect on it; and the components of “collaborative teaching learning atmosphere” have an 91.2% effect on it. The overall impact of all the factors on the effectiveness of online teaching obtained is 86.8%. If we increase all these factors by 1 unit, the increase in the effectiveness of online teaching will be 0.868 points.

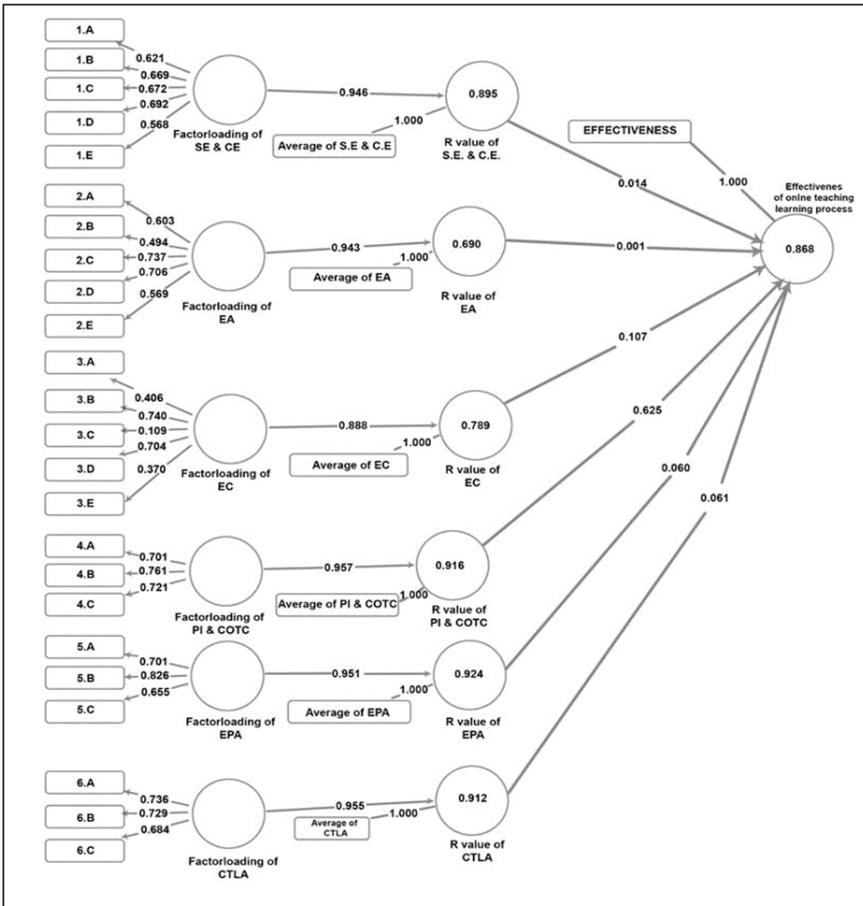


Figure 1. Structural Equation Model

Source: Smart PLS composition.

Conclusion

The World Economic Forum stated that the education system has changed after the COVID-19 pandemic. The education sector will have to bring a much-needed innovation to impart education. Teachers and students both were comfortable in traditional teaching methodology, but amid the crisis, connecting online is the only option left and for how long we are required to connect on online platforms is unpredictable. This difficult time has taught us that nothing is certain and we need to prepare ourselves to face the challenges. The fact cannot be denied that it is the responsibility of the entire education industry to stay connected with the learners in the momentous approach.

E-learning implementation models should be researched and adopted to keep going with the teaching and learning processes worldwide. In the middle of all, Internet is the foremost technological advancement reshaping the education industry worldwide. The current research identified six significant factors such as “self-efficacy and cognitive engagement,” “evaluation and assessment,” “personalized interaction and command over the class,” “environmental characteristics,” “effective pedagogical attributes,” and “collaborative teaching and learning atmosphere,” and with the help of quantitative research, the conclusion is drawn that the presence of these attributes significantly impact the effectiveness of the online teaching and learning processes. Finding from the research concludes that individual involvement known as “self-efficacy and cognitive engagement” plays a fundamental role in the effectiveness of the online teaching and learning processes along with other parameters.

Learning is an individual process, and it is essential that every individual should take it as their core responsibility. Parallel to this, teacher’s role is to enhance their technical skills and try to engage students by offering unique content and involving them in discussion forums. Adversity will keep on occurring, and technologies will help us cope with the challenges. Preparedness for uncertainties is the medicine to face the challenges; our homework will help us to survive in hard times. Undoubtedly, the multimodal content delivery approaches, command over technology, and working for innovations for the teaching and learning processes would be a better way to deal with the intricacy of the online education system.

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1. <https://edsources.org/2020/take-this-pandemic-moment-to-improve-education/633500>

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