An impact of content delivery, equity, support and self-efficacy on student's learning during the COVID-19

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Abstract
Due to the outbreak of Covid-19, the colleges and universities across the world have shifted to online classes in place of face-to-face classes. In the wake of this outbreak, the present study focuses on analyzing the impact of sudden shift to online classes, on the undergraduate and postgraduate student's overall learning. The PLS-SEM results concluded that the content delivery has been the most significant construct to impact both self-efficacy and overall learning. The self-efficacy partially mediates the support and equity relationship with the overall learning. The student with greater self-efficacy will have better overall learning from this e-synchronous teaching methodology. However, content delivery has a stronger role in impacting the overall learning even if there is absence of self-efficacy, thus concluding no mediation.

Keywords Student centered learning · Teacher effectiveness · Educational research · Synchronous communication · Online education

Introduction

The year 2019 ended with the emergence of COVID-19 in Wuhan, China. However, it rapidly spread to other parts of China in the beginning of the year 2020. The authorities in China locked down several places in China, to prevent it from further spreading (Xiang et al., 2020). Even when residents of other countries were only understanding the severity of the COVID-19 in China, cases have started emerging in their own countries. This soon transformed into a global threat (Spina et al., 2020), which has brought countries to a standstill in the first quarter of the new year. On March 11, 2020, this COVID-19 was declared as a pandemic (WHO, 2020). In response to the WHO news, countries all over the world, imposed travel restrictions to further prevent the spread of COVID-19. Being a highly contagious virus, the only option left was to impose lock-down in the nations to force people to stay at homes to control containment.

The Government of India (GOI) also announced complete lockdown of the nation on March 24, 2020 (Gettleman & Schultz, 2020). All the corporate houses, government offices, businesses, schools, colleges, universities have been shut down. GOI has been taking measures of self-isolation, quarantine, social distancing, strengthening the health facilities and asking people to work from home, to fight against the invisible enemy. According to the United Nations, the speed and scale of disruption due to COVID-19 pandemic is "unparalleled", especially in the education sector impacting more than 72% of the students in the world (UNESCO, 2020). This crisis has crystallized the dilemma faced by academic administrators and management to either educational institution (to reduce the contact and save lives) or keep them open (asking the faculty members to work from home). However, abiding by the lockdown restrictions and severity of the COVID-19, the schools and colleges decided to shift to online or synchronized learning instead of face-to-face classes, overnight.

From recording lectures to sharing notes with the students (asynchronized learning); from taking classes online (synchronized learning) to motivating students to enroll for online courses, the faculty members across the globe have been making every possible effort to engage students in academics, while being in their homes. Moving forward with the discussion on online teaching, teachers have been delivering their

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lectures through various platforms, namely Zoom, Microsoft Teams, Google Classrooms, WebEx, Moodle, and others. However, such "onlinification" (Lee, 2020) of face-to-face lectures has yielded mixed results for students as well as teachers. It has always been a challenge for the teachers to engage students in face-to-face classes. However, with the change in the scenario, the COVID-19 pandemic has forced teachers to conduct online classes and that too without proper training. This has further added to the challenge of engaging students actively. The challenge is not only limited to teachers, even students have different challenges at hand. The students come from different backgrounds and all don't have the same access to adequate resources and opportunities, in order to support their education, outside their college/institute/university (Mineo, 2020). Thus, students who have access to high-quality learning resources have been fine during the crisis and leading a normal life. However, the economically challenged students, who do not have access to quality learning resources as well as required equipment for sudden transition, have been at the suffering end. Also, as the home environment is different from the college, thus many students have been finding difficulty in maintaining a balance in their study schedule (Lederman, n.d.).

This study is an attempt to analyze the impact of this COVID-19 induced forced transition to online learning, on the overall learning experience of the student. Also, shifting to online classes because of the pandemic has not been studied in depth because of limited occurrence of these kinds of worldwide pandemics. The studies in the past have focused on the impact of MOOCs on the student satisfaction, performance and learning among others (Marks et al., 2005). However, limited literature has addressed the impact of online teaching or synchronized learning on the student learning. As compared to interactions with peers, the teacher presence has a better influence on a student's success in the online mode of learning (Means et al., 2014). The present study wants to guide the instructors in terms of highlighting the importance of online content delivery, dispersion of resources among the student community, out of class online support and willingness of students. These antecedents play a vital role in both offline and online education. However, due to the pandemic, these are crucial in the online teaching learning process. In the light of pandemic, researchers are also trying to put an argument that these antecedents affect the self-efficacy (willingness of the student to learn or study) and thus the overall learning of the student.

Theory and Hypothesis Development

Online learning has been defined as a set of systems administered by a computer and driven by an internet connection, which enables learners to reach specific content that they wish to learn from a distance (Harmer, 2015). Online learning has been initially restricted to just being online, as in a distance education mode, where students were required to just watch and listen passively. Online learning now includes the concept of hybrid learning and flipped classrooms, which is positively accepted across the nations (Blake, 2011). The internet based-classes has changed the way teaching takes place in the 'live-lecture classes' as it has offered new teaching pedagogies and styles like experiential learning and student-centered learning (Figlio et al., 2013). The technology has promised to change education for the better by making it more affordable and accessible. This promise of educational technology is significant in today's era when the environment, education practices, cultural diffusion, societal structures have been changing considerably.

Another important consideration, which plays a greater role in impacting the student performance is self-efficacy. The students tend to ask whether they will be able to complete the task assigned to them; whether that task would be useful; will they be able to retain their concentration in session and others. Thus, these kinds of questions end up influencing their performance, learning, and even satisfaction from a particular task or course. The study conducted on Chinese university students concluded that, behavior and attitude of the students inclined their decisions towards using MOOCs as a learning aid (Zhou, 2016), while another study stated that the key motivators for students' engagement in MOOC were personal interests and lifelong learning (Williams et al., 2018).

Self-efficacy has been the essence of Bandura's Social Cognitive Theory (SCT). The theory stated that in order to produce the desired achievements and results, one's belief in his/her own ability to organize and act, plays a greater role and thus termed as self-efficacy (Bandura et al., 1999). A student's performance outcomes have been positively predicted by the self-efficacy, in different subjects. In other words, various studies have observed student self-efficacy has a direct significant impact on the academic performance (Chemers et al., 2001; Lent et al., 2008; Usher & Pajares, 2008). The course satisfaction can also be predicted by the self-efficacy in case of traditional face-to-face classrooms (Bandura et al., 1999). However, in relation to online teaching or e-synchronous learning, research has been limited. The existing studies have focused on examining the mediation effect of self-efficacy on the students' course satisfaction relationship. Thus, given this theoretical background, the current study wants to analyze the role of willingness of the student to learn in this flipped classroom approach.

H1: Self-efficacy positively impacts the overall learning of the student.

The earlier study has rightly pointed that student self-efficacy is indirectly linked with the teaching practices of a

teacher (Bonneville-Roussy et al., 2019). The study of (Schunk & Pajares, 2002) highlighted that in order to foster student self-efficacy, teaching effectiveness is an important factor. Also, as per study of (Jackson, 2002), the students put forth a high degree of effort and better performance if they have positive self-efficacy and their achievement goals are also related to their self-efficacy (Bouffard & Couture, 2003). The studies of Kirkpatrick (2020) and Hammond et al. (2020) have been the major motivators for the present study model selection. The former study has developed the scale to assess how the respondents reacted to the training event and later have been the survey conducted by Texas University to study the impact of transition to 100% online education on the students during COVID-19. Since, the present study scope is limited to live online classes only, thus not all the variables have been taken from these. The study of Kirkpatrick (2020) gave facilitator delivery, facilitator style and facility constructs. While Hammond et al. (2020) provided the variable of equity, support and overall learning. The other variables present in both the studies have not been taken as they have either little or no relevance to this study. The authors have then conceptualized the model to study the impact of online classes on the overall learning of the students during this worldwide pandemic. The proposed model has been presented in Fig. 1 and followed by the existing literature related to them.

The students can use technology anywhere, anytime be it home, campus or while travelling using a mobile device or a tablet or laptop (Gordon, 2014). This COVID-19 has also shown to everyone that the use of digital platforms, to deliver secure and quality content along with access to quality teachers, is the new way of learning (Kupathil, 2015). Thus, now all the students are in the front row, and they cannot hide in the back of the class. Hence, enabling the teachers to be more attentive to the requirements of their pupils. With this optimistic side, there has been a pessimistic side also to this forced transition, foremost being instant adaption or switch expected from teachers as well as students. The resource's availability has also not been the same with everyone, and the home environment is totally different as compared to the college scenario (everyone at home, limited access to internet, lack of private space, presence of children and others).
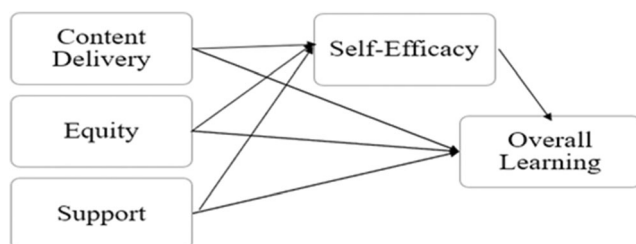

Fig. 1 Proposed Model

Content Delivery

The asynchronous learning model uses tools like e-mails, recorded videos, newsgroups and others, where learning does not occur in the same place or same time. The synchronous learning, on the other hand, happens in the same learning environment using tools namely chat rooms, webcasting, audio/video technology, conferencing, and others. This is similar to face-to-face classroom environment (Means et al., 2010a). The presence of teachers is the element that binds together the online learning community and ensures effective online learning (Garrison et al., 2000). The course structure and instructor's presentation contributed significantly to the students' overall satisfaction (Vodenska et al., 2012). The course content, course delivery and course assessment have been significant in impacting the learners' satisfaction from the MOOCs (Kumar & Kumar, 2020) while continuous interaction with the instructor plays a key role in learner's retention (Hone & Said, 2016). There have been other studies, which have been of greater significance here, as they found positive relationships of course design, facilitation (Baker, 2010) and teacher presence with the student learning (Akyol & Garrison, 2008) and satisfaction perception (Shea et al., 2003).

Thus, in both types of learning models i.e. synchronized or asynchronized, content delivery plays a greater role. The reaction sheet by Kirkpatrick (2020) has gauged the parameters of content delivery like, how effectively the facilitator delivered the program material; did the facilitator use a variety of instructional methods; has the duration of the session been sufficient and others (Kirkpatrick, 2020). If these parameters are well taken care of by the teachers, then definitely students' engagement and involvement in the session would improve.

> H2: Content delivery significantly impacts the overall learning.
> H3: Self-efficacy significantly mediates the relationship between content delivery and overall learning.

Support

Digital environment offers an opportunity to the students wherein students are more engaged and can develop their learning interests (Bebell & O'Dwyer, 2010). MOOCs are also a mode of online learning but it lacks teacher presence. It is a form of asynchronous mode of learning. The course delivery or instructor support and content have been the main reasons contributing to the MOOC learner's satisfaction (Onah et al., 2014; Siemens, 2012). Navigating the ocean of online learning simplifies with the proper support and guidance of the instructor (Reimers & Schleicher, 2020). A study has been conducted during 2012 to 2015, identified that the

collaboration, interaction with the instructor, networking opportunities, content delivery, course content, course assessment, course usability, and support from learners, affect a MOOC learner's satisfaction (Gamage et al., 2015). The Organization for Economic Co-operation and Development (OECD) framework suggests that at least a system of daily communication with the students should be in place in these tough times (Reimers & Schleicher, 2020). This positively motivates a student and influences his learning experience (Twining et al., 2005). As the scenario of these online classes have been totally different because of COVID-19 pandemic, the support from the institute/university plays a greater role. This support helps in building the confidence and sense of security in the students about their course completions.

> H4: Support by the college/Institute/University significantly impacts the overall learning.
> H5: Self-efficacy significantly mediates the relationship between support and overall learning.

Equity

To sustain continued learning via technological solutions one often faces inequalities of a varying order. Having adequate resources such as uninterrupted power supply, the network enabled devices, physical workspace and an active internet connection are foremost in order to ensure smooth digital and e-learning. There have been many such definitions of the term digital divide, which assesses the inequities in technology complex. The inequities also exist among students with respect to the support provided by their parents in terms of the educational opportunities. The students possess varying levels of resilience, skills and enthusiasm when it comes to learning independently and through the online mode (Journell, 2007). All this aggravates the existing opportunity gaps related to shifting to online classes. Thus, from lack of equipment to physical space, many students have been at disadvantage in today's online learning model. Also, poor/weak internet connection further adds to miseries of the students, trying to adjust in these hard times.

The teachers, students and families with availability of resources namely the internet, computers or tablets, adequate electricity and personal workspaces, can only be able to nurture the benefit of distance education and e-learning. Also, there have been many not so developed countries, in which traditional media-based learning often offers more viable ways of helping teachers to continue to provide education (McAleavy & Gorgen, 2020). In context to the current crisis in the global scenario, UNESCO-IIEP has emphasized that maintaining equity will be a big challenge, especially when the disadvantaged students transition to learning remotely (Stefania & Grant, 2020). On these lines, the survey of

Hammond et al. (2020) tried to analyze the reaction of the students to this transition in terms of accessibility to reliable internet connection, availability of required equipment and experience with the online class (Hammond et al., 2020).

> H6: Equity positively impacts the overall learning.
> H7: Self-efficacy significantly mediates the relationship between equity and overall learning.

Methods & Materials

Design of the Study

The sample of the study consisted of students studying in either undergraduate (UG) or postgraduate (PG) programs in any institute or university in Delhi-NCR. The structured questionnaire had been mailed to thousands of students across Delhi-NCR, with the help of databases collected from institutes and universities. Also, questionnaires have been mailed to teaching fraternity for further distribution to students in their network. The total of 560 responses has been received from the students whose college has started the online classes with a proper schedule using platforms namely Google Classroom, Zoom and Microsoft Teams. After cleaning of the data, a sample of 520 responses was selected to work upon for the testing of hypotheses.

Measures

The items used to measure the impact of sudden change in education worldwide, from face-to-face teaching to 100% online teaching, has been adapted from studies of Bandura et al. (1999), Kirkpatrick (2020) and Hammond et al. (2020). Since the present study scope has been limited to measuring impact of live online classes on the student learning, thus some of the variables have been taken from these studies (refer Table 1). The few items in the variables have been moderated to suit the need of present study. The impact of the shift from face-to-face classes to completely online classes has been measured by the dependent variable i.e., overall learning. Further, the authors have measured the overall learning of the student owing to this change in the mode of education, due to COVID-19, by the four-item scale. The statements for overall learning have been taken from the survey of Hammond et al. (2020). The pre-test was conducted (with academic experts and 30 UG and PG students), for testing the reliability and validity of the overall learning construct. The validity and predictability of three items only out of the defined four items was established, thus OL has final three measured. Hence, the model objective is to analyze the impact of support (US), equity (EQ), content delivery (CD) on the self-efficacy (SE)

and then on the overall learning (OL) of the student. All these constructs represent reflective models and are measured on a seven-point scale of strongly disagree to strongly agree. The past studies show that the psychometric properties of the variables under investigation are found to be reliable and valid (McAleavy and Gorgen (2020); Gamage et al. (2015); Vodenska et al. (2012)). A recent study by (Reimers & Schleicher, 2020) and (Jackson, 2002) affirms the internal consistency and validity of the scale, thus lending support to the use of the same scale with slight modification of wordings to suit the context in this study.

Data Analysis

The partial least square - structural equation modeling (PLS-SEM) has been used to test the relationships between endogenous and exogenous constructs on the SmartPLS 3 software (Ringle et al., 2015). This methodology is suitable for theory building and puts fewer restrictions on the data distribution and sample size (Vinzi, 2010). The direct and indirect relationships have been tested at once in the PLS-SEM. Another reason for using this methodology is testing of the theoretical model from a prediction perspective and for possibility of further theoretical extensions. The model has been first tested for the validity & reliability issues with the help of Cronbach Alpha, Composite Reliability and Heterotrait-Monotrait ratio. Once the model fits the criteria of reliability and validity, then bootstrapping has been conducted to test the hypothesis. Predictive relevance of the model has been tested to ensure the predictive power of the model.

Limitation

The authors acknowledge the limitation that the sample was limited to undergraduate and postgraduate students only. Another limitation is relying only on known contacts/ references of the authors in various colleges and universities for data collection due to the COVID-19 restrictions.

Ethics Statement

The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Results

The measurement model has been tested to measure the internal reliability. The results of reliability and validity of the constructs have been presented in Table 1. All the loadings of the construct items exceed the threshold value of 0.708 (Hair et al., 2013). Since, the values of Cronbach's alpha (α)

and Composite reliability (CR) have been higher than 0.70, it indicates high internal reliability of all the constructs (Sarstedt et al., 2017). The model is also checked for discriminant validity by way of Fornell and Larcker criterion and Heterotrait-Monotrait (HTMT) ratio of correlations. As suggested by Hair et al. (2013), indication of no discriminant validity can be ensured if all the HTMT values are significantly lower than 0.85 (our model satisfy this criteria).

The structural model has then assessed for the collinearity issues by checking the VIF (variance inflation factor). As shown in Table 2, all the VIF values are way below the threshold level of 3.3 (Diamantopoulos & Siguaw, 2006), thus there have been no collinearity issues in the constructs. The structural relationships have been analyzed by way of bootstrapping methodology. The results of the bootstrapping with 5000 samples, reveals that most of the relationships in the structural model have been significant. The R^2 focuses on the in-sample predictive power, however for path model predictive accuracy, Q^2 value is important. The blindfolding procedure has been used to estimate the value of Q^2. As a thumb rule, Q^2 values of the PLS-path model higher than 0, 0.25 and 0.50 depict small, medium and large predictive relevance (Hair et al., 2019).

The structural model (shown in Fig. 2) results in Table 2, explained 74.8% variance in the OL and 65.7% in the SE. The value of R^2 for both OL and SE has been substantial as per the threshold values (Hair et al., 2013). In terms of the direct relationship of independent variables (US, CD & EQ) with OL & SE, the Q^2 is 0.499 and 0.399 respectively, indicating large and medium predictive relevance. The model didn't have multicollinearity, as the VIF values were below threshold level of 3.3. The most significant construct in the model, on the basis of the f^2 effect size has been CD for the overall learning as well as self-efficacy.

In order to analyze the predictive relevance of the model 2, PLSpredict has been used with 10 folds and 10 repetitions. In Table 3, it can be observed that except one item, all the construct's items outperform the LM model (naïve benchmark), as $Q^2_{predict}$ values have been greater than zero. The errors generated by the PLS-SEM has been low as compared to errors by the naïve LM benchmark (the maximum of the items has negative RMSE difference.). Thus, the model would be able to predict self-efficacy and overall learning with the moderate predictive power.

To conduct the mediation analysis, the presence of significant direct effect of exogenous variables on the endogenous variable is not the necessary condition (Nitzl et al., 2016). Thus, the significance of indirect effect is assessed, and significance of direct effect is assessed to determine the type of effect and/or mediation. Mediation results presented in Table 4 conclude that in path 1 both direct and indirect effect has been significant and VAF value is >0.20, thus there is presence of partial mediation.

Table 1 Reliability, Validity and Factor loadings

Construct Items		Loadings	Cronbach's Alpha (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Usefulness & Support (US) - (Hammond et al., 2020)			0.756	0.845	0.578
US_1	I am absolutely comfortable with online classes in COVID'19 pandemic	0.834			
US_2	I feel supported by my college/university during this sudden change to online classes in COVID'19 pandemic	0.709			
US_3	I think online classes are useful in COVID'19 pandemic	0.708			
US_4	I feel that I have received good communication from the university/college in COVID'19 pandemic	0.783			
Content Delivery (CD) - (Kirkpatrick, 2020)			0.845	0.889	0.617
CD_1	The teacher used a good variety of instructional methods.	0.755			
CD_2	I am comfortable with the pace of the online classes	0.714			
CD_3	The teacher allowed for questions during the online class	0.842			
CD_4	The teacher paid attention to all the students	0.787			
CD_5	The duration of the online class is good	0.823			
Equity (EQ) - (Hammond et al., 2020)					
EQ_1	I have sufficient I have sufficient access to equipment to successfully transition to online learning	0.774	0.796	0.867	0.620
EQ_2	I have access to reliable internet connection	0.822			
EQ_3	I feel that moving online is going to be better for me compared to how the courses were offered previously	0.726			
EQ_4	I experience minimal distractions during the online class	0.823			
Self-Efficacy (SE) - (Bandura et al., 1999)			0.844	0.895	0.681
SE_1	I can memorize what I study	0.795			
SE_2	I am able to concentrate/pay attention in classes	0.868			
SE_3	I am able to plan work & study	0.831			
SE_4	I am able to study even when there are other interesting things to do	0.804			
Overall Learning (OL) - (Hammond et al., 2020) + Pre-test			0.770	0.867	0.685
OL_1	My overall learning in this course will be better due to online classes in COVID'19 pandemic	0.829			
OL_2	I think online classes under COVID'19, has changed the quantum of material I learn	0.784			
OL_3	I feel that my focus in the subject has increased because of online classes in COVID'19 pandemic	0.867			

In other words, OL is impacted partially by US and partially by SE. The partial mediation indicates that even with adding the mediating variable, the direct relationship doesn't reach zero i.e. remains significant. Hence, it can be said that self-efficacy makes the overall learning of the student from the course better. Thus, as the self-efficacy of a student improves it tend to improve the overall learning of the student. If we see the results of path 2, which access the mediation of SE on the EQ an OL relationship, both the direct & indirect effect have been significant. Hence, as the presence of equity improves, the self-efficacy of the student also improves furthers leading to positive impact on the overall learning. However, mere absence of equity doesn't hinder in the overall learning of the student, as self-efficacy and content delivery plays a prominent role. Another interesting finding has been that even if the

student doesn't have adequate resources, however has positive self-efficacy, then also overall learning improves. The results of the path 3, which has the most prominent construct of the model i.e. CD, indicate the absence of mediation. In this path, although both the direct and indirect effect has been significant, however VAF has been less than 0.20, thus concluding to no mediation.

Discussion

The survey results concluded that the support by the institute/university, organized content delivery, face to face online interaction, availability of internet and equipment, significantly impact the overall learning of the students. The presence of

Table 2 Results of PLS Bootstrapping

Relationships	Path coefficients	Std Error	*P* value	VIF	LLCI (5%)	ULCI (95%)	R²	f²	Q²
US ➜ OL	0.127	0.054	0.019*	2.402	0.034	0.215	0.748	0.024	0.499
CD ➜ OL	0.529	0.042	0.000*	2.444	0.460	0.598		0.409	
EQ ➜ OL	0.091	0.044	0.040*	1.995	0.020	0.167		0.016	
SE ➜ OL	0.208	0.055	0.000*	2.706	0.121	0.304		0.059	
US ➜ SE	0.348	0.058	0.000*	2.335	0.248	0.438	0.657	0.153	0.399
CD ➜ SE	0.356	0.057	0.000*	2.375	0.261	0.448		0.157	
EQ ➜ SE	0.207	0.052	0.000*	2.011	0.126	0.297		0.063	

*indicate significant at 5% level of significance

significant positive relation between US and OL indicates that, with the more informed practices by the institute/university, comfortability in online classes, and usefulness of education, the students have a positive outlook towards their overall learning. In other words, if the students find these online classes useful and knowledgeable, then their learning from the course tends to be more. Onah et al. (2014), Gamage et al. (2015) and Siemens (2012) findings were consistent with the current study, i.e. course delivery, instructor support and course content are the major drivers of student satisfaction. The OL construct measures the opinion of students in terms of change in knowledge absorption and focuses on the subject/course. Garrison et al. (2000) also concluded that the presence of teachers ensures effective online learning. The EQ construct measured the availability of the internet, ease to use the technology and accessibility to equipment. In order to ensure effective learning during this COVID-19 scenario, there has to be a presence of equity. Our results confirm that if there is a presence of equity then self-efficacy of the student increases, thus increasing their overall learning. However, still for many students this equity has not been achieved. Thus, adversely affecting their overall learning during this

pandemic. This has also been highlighted by McAleavy and Gorgen (2020), that distance learning and online learning is only effective with presence of internet, equipment, electricity and personal space to work upon. The results concluded that CD had a major impact on the SE as well as overall learning of the students. Another study has also concluded that irrespective of content delivery i.e., either face-to-face or online, CD plays a major role in driving the overall learning and satisfaction of the student (White et al., 2018). The results also confirm with the studies of (Means et al., 2014; Marks et al., 2005), that as compared to interactions with peers, the teacher's presence influences student success more in an online environment. Shea et al. (2003) found a positive relation of course delivery, facilitation and teacher presence on the student learning. The direct relationship between SE and OL has also been found to be significant. This indicates that with strong academic self-efficacy, students end up having better online learning. The studies of Zhou (2016) and Williams et al. (2018) confirms with the current study results, that personal interests, lifelong goals, intention to learn and other behavioral concerns affect the student's engagement in the online content.
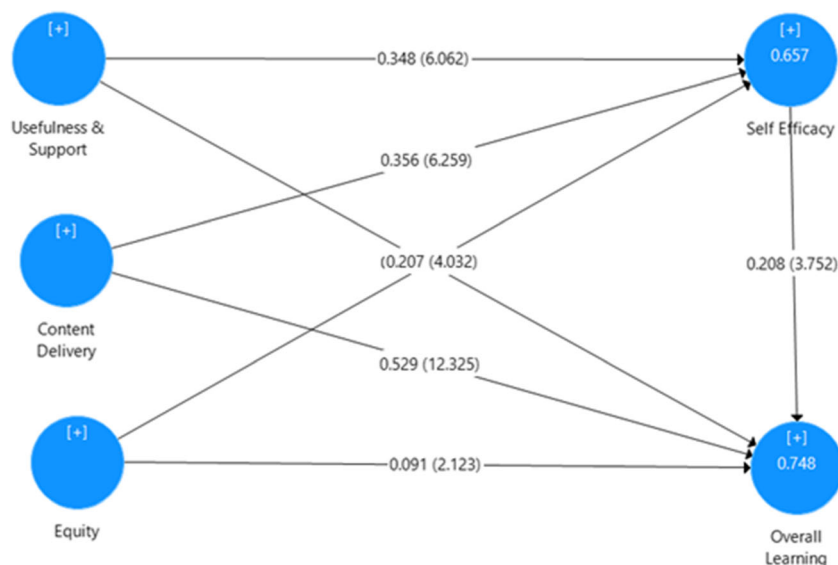
Fig. 2 Structural Model

Table 3 Results of PLS Predict

Items	PLS-SEM		LM	PLS SEM - LM
	RMSE	$Q^2_{predict}$	RMSE	RMSE
OL_1	0.819	0.494	0.828	−0.009
OL_2	1.034	0.384	1.041	−0.006
OL_3	0.770	0.607	0.299	0.472
SE_1	1.038	0.482	1.064	−0.026
SE_2	1.106	0.494	1.144	−0.037
SE_3	1.495	0.353	1.542	−0.046
SE_4	1.532	0.337	1.589	−0.057

Hence, even if a student lacks SE, then also content delivery significantly affects the overall learning of the student. If the course structure is clear, there is a presence of the teacher, effective usage of teaching aids and organized lecture/class, the overall learning of the student would increase. The results of our study confirm with the findings of (Usher & Pajares, 2008; Means et al., 2010b; Bonneville-Roussy et al., 2019; Kumar & Kumar, 2020; Lent et al., 2008), that academic performance is directly impacted by the student's self-efficacy. Also, as compared to the students with low self-efficacy, students with greater self-efficacy display better performance and have greater academic expectations. Thus, if the support is provided by the institution/university and student has zeal to study, then his/her overall learning improves. The present study has also added to the literature that effective content delivery measured by presence of the teacher, use of better teaching aids, and engaging sessions, plays a greater role in influencing the overall learning of the student from the course even in the absence of self-efficacy. The overall results confirm with the existing literature with respect to online learning, however, in terms of online teaching, our findings are an addition. In the present scenario of flipped classrooms, where now classes have been happening online and not offline, the student with greater self-efficacy will have better overall learning. However, if the teachers are providing good content along with efficient delivery, then it has a stronger role in influencing the overall learning of the students even if there is absence of self-efficacy. Thus, in short, self-efficacy plays a greater role (as suggested by earlier studies of online learning), however when online teaching is effective with good content delivery then even without self-efficacy, the overall learning increases.

The researchers can further expand this study with more heteroscedastic data from different institutes and universities across the country. Further studies should focus on analyzing the impact of mental health and transition of classes on the futuristic performance of students in the pandemic. Even researchers can study the impact of COVID-19 pandemic on the teachers, in terms of pros and cons of online teaching.

Implications of Study

These widespread school closures in 2020 have led the universities and colleges worldwide to resort to remote pedagogy teaching with the use of technology. Online learning can turn out to be a great opportunity in the current scenario. The school and college students are young and enthusiastic. However, there has been a point of difference in terms of a blend of synchronous teaching via the internet and asynchronous teaching by way of content upload. The present study has made an attempt to study the impact of teacher presence (e-synchronous teaching) in the online class, on the overall learning of the students. The academic authorities should have to embrace the technology to its fullest level for the future academic processes. They should understand that mere uploading of content doesn't help in building the overall learning of the student in COVID-19 like the world crisis.

The teachers should focus on making their live sessions more engaging. They can make use of available online teaching aids and customize as per their course requirement. In this digital era, teaching through the online mode can offer better learning experiences if the teachers use the technology to the fullest level for future academic processes. Also, teachers now

Table 4 Results of Mediation Analysis

	Association	Direct Effect	Indirect Effect	Total Effect	VAF	Result
Path 1	US ➜ SE ➜ OL	0.127*	0.072*	0.199	0.362	Partial Mediation
Path 2	EQ ➜ SE ➜ OL	0.091*	0.043*	0.134	0.321	Partial Mediation
Path 3	CD ➜ SE ➜ OL	0.529*	0.074*	0.603	0.123	No mediation

*indicate significant at 5% level of significance

have all the students in the front row and can better gauge the participation of the student in the online classes. The universities and institutes should address the difficulties faced by the teachers, in this online transition scenario, by organizing professional training programs. This forced transition has already forced the universities around the world to upgrade their technical infrastructure and add blended learning as a core component of teaching. The universities should also shift their evaluation to the online mode, so that overall assessment of the student does not suffer.

The government authorities should work towards reducing the inequalities with respect to availability of reliable internet connection at every place. Ensuring equity for the disadvantaged students, is the need of an hour. Institutes and teachers have to make additional effort to reach these students via other sources of knowledge, so that these students can also be at par with their privileged peers. The universities and institutes should infuse the blended learning concept in every curriculum, so that students and teachers don't suffer in this kind of pandemic or national emergency. The need of the hour is to shed the blanket of 100% classroom teaching and move to a digitized blend of teaching.

Conclusion

There has been continuous discussion regarding the continuity of teaching for all the students all over the world after the widespread closures of schools and colleges in year 2020 due to the COVID-19 pandemic. To ensure the undisrupted learning, schools/colleges/institutes/universities have taken up a bold step by shifting to the online mode/e-synchronous learning. However, factors like inequity with reference to the availability of resources i.e., network enabled devices, physical work space and an active internet connection, still create a gap between the face-to face learning and the virtual mode of learning.

Thus, using PLS-SEM, this study analyzed the impact of content delivery, support and equity impacted the overall learning of the students in this COVID-19 pandemic. The results concluded that online education, measured by content delivery, support and equity, have been directly significant in impacting the overall learning of the student during the pandemic. The content delivery effect has been more significant, in ensuring better overall learning of the student, followed by the teacher presence and presence of stable internet connection along with computer/tablet/laptop availability. The self-efficacy has also been significant in impacting the overall learning and partially mediates the relationship between all the predictors and the overall learning. The relationship of usefulness & equality with overall learning becomes strong when there is presence of self-efficacy. However, self-efficacy does not mediate the relationship between content delivery

with overall learning. In other words, self-efficacy is important, however content delivery is more significant in impacting student's overall learning. The model has medium predictive relevance in predicting the self-efficacy and overall learning.

Declarations

Conflict of Interest The authors have no conflicts of interest to declare that are relevant to the content of this article.

Ethical Statement The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Informed consent was obtained from all individual participants included in the study.

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