Revista de Psicodidáctica

Original

Online learning during the COVID-19 pandemic: Applying the self-determination theory in the 'new normal'☆

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A R T I C L E   I N F O

A B S T R A C T

The COVID-19 pandemic has introduced the notion of the 'new normal' in daily life through profoundly influencing the way we used to live, study and work. During these unprecedented times, the rapid transition from traditional face-to-face learning to online learning has been viewed as a paradigm shift in higher education. Drawing impetus from the self-determination theoretical framework, the present study aims to examine the impact of the online learning climate on student's engagement. It also hypothesizes the mediating role of basic psychological needs on the nexus between online learning and students' engagement. Total 689 students taking online classes in ten (five publics and five private) universities of Pakistan responded to the web-based survey. The present study findings do not support the direct influence of the online learning climate on student engagement, nevertheless, this relationship was mediated by students' perceptions concerning the extent to which their basic psychological needs were satisfied/dissatisfied. This study theoretically and empirically contributes to both the psychology and higher education literature, pertaining to the developing field of online learning. The practical implications from this study inform policy-makers in academia to reflect on the students' psychological needs within virtual teaching environment.

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Aprendizaje en línea durante la pandemia del COVID-19: aplicación de la teoría de la autodeterminación en la 'nueva normalidad'

R E S U M E N

La pandemia del COVID-19 ha introducido la noción de la 'nueva normalidad' en la vida diaria al influir profundamente en la forma en que solíamos vivir, estudiar y trabajar. Durante estos tiempos sin precedentes, la rápida transición del aprendizaje presencial tradicional al aprendizaje digital se observa como un cambio de paradigma en la educación superior. Inspirándose en el marco teórico de la autodeterminación, este estudio tiene como objetivo examinar el impacto del aprendizaje digital en la motivación de los estudiantes. También plantea la hipótesis del papel mediador, de las necesidades psicológicas básicas, en el nexo entre el aprendizaje digital y la motivación de los estudiantes. 689 estudiantes que asistieron a clases digitales en diez universidades (cinco públicas y cinco privadas) de Pakistán respondieron a la encuesta preparada en la web. Los resultados de esta investigación no confirman la relación directa entre el aprendizaje digital y la motivación de los estudiantes, sin embargo, esta relación sí está mediatizada por las percepciones de los estudiantes sobre el grado en que sus necesidades psicológicas básicas estaban satisfechas / insatisfechas. Este estudio contribuye teórica y empíricamente a la literatura tanto de la

psicología como de la educación superior, perteneciente al campo en desarrollo del aprendizaje digital. Las implicaciones prácticas de este estudio informan a los responsables de la formulación de políticas en el ámbito académico para que reflexionen sobre las necesidades psicológicas de los estudiantes dentro del entorno de la enseñanza virtual.

Introduction

The COVID-19 pandemic has profoundly influenced almost everyone and everything from multidimensional perspectives. This particularly has affected the way we used to live, study and work - entailing the "new normal" during these unprecedented times. This new trend relates to the notion of studying and working remotely and getting universal acceptance (Chiodini, 2020). Since the last two decades, the popularity of Information and Communication Technologies (ICTs) highlights the significance and adoption of online learning practices as a useful tool in higher education across many countries (Bowers & Kumar, 2015; García-Martín & García-Sánchez, 2018; García-Martín & Cantón-Mayo, 2019; Surma & Kirschner, 2020). However, despite the introduction of interactive activities and inclusion of synchronous online sessions, the online learning context offers a distinctive pedagogical approach as opposed to face-to-face learning that entails adjustment and readiness to engage in an effective learning experience. Notably, due to the sudden closure of educational institutions across the globe during the COVID-19 pandemic, the rapid transition from traditional face-to-face learning to online learning has become a peculiar phenomenon that history has never witnessed earlier (UNESCO, 2020).

While the notion of online learning has received greater acceptance in developed countries (Abe, 2020), the popularity and feasibility of online learning in developing countries is subjected to many challenges (Isaac et al., 2019). Especially in this particular year, before 25th February 2020, almost all public and private universities in Pakistan were exclusively engaged in traditional face-to-face learning practices. However, since the emergence of the COVID-19 pandemic, all educational institutes were immediately instructed to close by the Higher Education Commission of Pakistan and to initiate online learning to avoid students' academic loss (HEC, 2020). While Pakistan is still one of the many countries that luckily has been less adversely affected from the COVID-19 pandemic, but keeping in view the new special operating procedures (SOP) in place, it is not yet safe nor advisable for universities to resume physical face-to-face teaching (HEC, 2020). Arguably, the digital transformation of higher education institutes through the provision of online learning platforms could be considered a new beginning. However, the sudden transition to virtual teaching environments, poses notable challenges to higher education institutes in Pakistan.

Prior literature from advanced countries links online learning experience with greater flexibility, increased access to high quality teaching materials, and self-regulatory behavior (Surma & Kirschner, 2020). There is also a call for paying more attention towards the fulfilment of student's basic psychological needs (Naylor, 2020). Pakistan, a developing country, with lack of relevant technological and educational resources, previously did not adopt online learning as a common practice in higher education. This raises a concern for conducting more research around the effective transition towards the "new normal" of remote learning in the Pakistani higher education context. Few studies from the Pakistani context have highlighted multiple barriers in the adoption of online learning (Aziz et al., 2014; Nawaz, 2012). Amongst these barriers, students' readiness and willingness is identified as one of the major challenges in the adoption of online learning (Aziz et al., 2014). The uncertainty and psychological distress during COVID-19 pandemic entails the creation of an online learning environment that may enhance students' engagement and address their basic psychological needs.

The purpose of this study is to investigate the mediating role of students' basic psychological needs on the nexus between the virtual learning climate and students' engagement. The contribution of this study to the interdisciplinary strands of psychology and higher education is extensive. First, this study extends theoretical insights drawing on the application of self-determination theory in the Pakistani higher education sector during the transition towards online learning. Second, this study empirically attempts to draw a distinction between need-satisfaction and need-dissatisfaction in terms of their mediating roles between the relationship of learning climate and students' engagement. Third, the study sheds light on students' engagement dimension towards online learning during this transition time. Fourth, the study makes practical contribution signifying whether certain virtual teaching and learning practices may be effective to inform policy-makers and students in the higher education sector in Pakistan.

Online learning and self-determination theory

Self-determination theory (SDT) is conceptualized as one of the most inclusive and empirically reinforced motivation theories in the educational context (Niemiec & Ryan, 2009). It elaborates how socio-contextual factors either support or impede an individuals' motivation through the fulfilment of their basic psychological needs (Ryan & Deci, 2017). This theoretical framework sheds light on key psychological aspects that may shape students' learning experience in the virtual learning environment (Chen & Jang, 2010; Sergis et al., 2018; Wang et al., 2019). Primarily, SDT emphasizes on human desire to fulfil three core psychological needs, namely; autonomy, competence, and relatedness (Ryan & Deci, 2017). Autonomy is conceptualized as the desire to self-regulate one's actions or undertakings. Competence is referred to as the ability in terms of effective task completion, while relatedness is conceptualized as the feeling of connectedness with others. It has been argued that online learning could offer multiple opportunities to satisfy the need for autonomy and competency, however, it could also raise serious concerns regarding the need for relatedness (Salikhova, 2020). While the initiation of online learning practices during the COVID-19 pandemic in the higher education institutes in Pakistan could encourage students toward self-regulated learning techniques to complete tasks efficiently, however, the lack of interpersonal interaction between instructor and fellow students could undermine the fulfilment of relatedness needs. Moreover, the fulfilment of basic psychological needs has been associated with boosting students' "joy of learning", or intrinsic motivation that could trigger students' engagement in achieving learning objectives (Wang, 2017). Thus, SDT is justified as a relevant and inclusive theoretical framework to examine students' basic psychological needs in the context of online learning during the COVID-19 pandemic.

Learning climate and students' engagement

It has been widely noted in the literature that the notion of an autonomy supportive learning climate draws impetus from self-determination theory (Williams & Deci, 1996). Within the educational context it refers to the instructors' role in evaluating students' perspectives, acknowledging their feelings, equipping

them with information and choices and mitigating the use of pressure and authority (Williams & Deci, 1996). Prior research documented that students' perceptions of an autonomy supportive learning climate might facilitate their learning processes (Williams & Deci, 1996). The learning climate has been linked with the achievement of learning outcomes through boosting students' engagement in the online learning context (Zheng et al., 2020). Students' engagement could be described from multiple dimensions pertinent to skills, participation, emotions and performance towards online learning activities (Dixson, 2015). Prior research highlighted students' engagement as a core benchmark for attaining success reflecting on the quality of students' experience of online learning in higher education (Redmond et al., 2018; Wang et al., 2019). There has been a growing debate that if universities have to increase their online presence and are to offer comprehensive online learning opportunities to students, it is important to recognize the critical factors that could positively contribute towards students' engagement (Redmond et al., 2018).

In the wake of the ongoing COVID-19 pandemic, students are facing multifaceted challenges. Thus understanding students' engagement is the foremost challenge that requires further insights. The present study conceptualizes student's engagement as to how students act, think, feel and interact in order to enhance their online learning experience. Dixson (2015) argues that in the online learning context many students may often feel isolated and disconnected that demands greater self-regulatory behavior with respect to more involvement and self-direction. As an autonomy supportive learning climate could enhance students' engagement with the environment, students tend to internalize and integrate the learning processes more thoroughly (Williams & Deci, 1996). The learning climate may offer an interactive setting where students may actively engage in critical thinking, discussion and interaction with their instructors, fellow students and course conveners (Zheng et al., 2020). It has been observed that an environment which encourages students towards sharing, negotiating, debating, discussion and knowledge exchange could prove to be far more engaging for the online learner (Woo & Reeves, 2007).

Moreover, there has been an ongoing discourse on the promotion of the conducive learning environment to boost student's engagement to attain learning objectives in the online learning context. However, we argue that there is lack of empirical research to validate this nexus (Wang et al., 2019). Recent studies have consistently called for paying attention towards examining the nexus between the learning climate and students' engagement with strong theoretical and empirical evidence (Bolliger & Halupa, 2018; Wang et al., 2019; Zheng et al., 2020). Keeping in view the underlying relationship between the learning climate and students' engagement, the present study hypothesizes that: (H1) There is a positive relationship between learning climate and student engagement.

Need satisfaction and need dissatisfaction as mediators

Whilst the debate on the factors that positively contribute towards students' learning experience persists, there is still growing concern regarding the important role of students' basic psychological needs in achieving the learning objectives (Durksen et al., 2016). According to SDT the basic psychological needs of autonomy, competence and relatedness could well delineate an individuals' motivation level to carry out a particular task in a desired manner. Prior literature illustrates that there is an underlying nexus among the provision of autonomy-supportive learning environment, students' basic psychological needs, and learning outcomes in the face-to-face context (Jang et al., 2016; Orsini et al., 2018; Wang et al., 2019). Nevertheless, there is limited research

available to validate these intertwining relationships in the online learning context (Chen & Jang, 2010; Wang et al., 2019; Zhou, 2016).

Primarily, SDT postulates that basic psychological needs may get influenced by the underlying intervention between students and social dynamics from the environment that can either facilitate or hinder these needs (Deci & Ryan, 2008). It has been argued that when students' basic psychological needs are met, they tend to be highly engaged in terms of acquiring knowledge in a more inclusive way without any external pressures (Wang et al., 2019). On the contrary, the un-fulfilment of these basic psychological needs mitigate intrinsic motivation, as subsequently, people become disengaged in their activities (Liu et al., 2014). The learning climate and students' engagement have been linked to students' motivation in the face-to-face learning context, but this nexus has been found to be indirect and mediated by the learning climate that either fulfills or thwarts students' basic psychological needs of autonomy, competence and relatedness (Orsini et al., 2018). This highlights that student's perceptions on social dynamics, such as the learning climate, may play a role to fulfil these needs and define their engagement.

Recently in the literature, there has been a critical debate that makes the distinction between the positive and negative dimensions of the basic psychological needs (Costa et al., 2015; Wang et al., 2019). These positive and negative dimensions of the basic psychological needs have been referred to as satisfaction and dissatisfaction/frustration in a number of empirical studies conducted across diverse contexts (Rodrigues et al., 2019; Zamarripa et al., 2020). It has been argued that the satisfaction of basic psychological needs could nurture conducive motivational orientation leading towards positive outcomes. On the contrary, dissatisfaction/ frustration can be triggered when individuals perceive that their basic psychological needs are being ignored or restricted. This distinction of need satisfaction and need dissatisfaction might be of core significance to understand student's motivation in the online learning context. However, this distinction between satisfaction/dissatisfaction of needs has not been studied critically earlier in the online learning context (Wang et al., 2019). This paper aims to extend this debate and gather more insights from a developing country like Pakistan. Subsequently, drawing impetus from the model proposed by Levesque et al. (2006) and endorsing Wang et al.'s (2019) call for further research in the online learning context, the present study conceptualizes need satisfaction and need dissatisfaction, as distinctive constructs that are used as mediators between the relationship of the online learning climate and student engagement. Therefore, the present study hypothesizes that: (H2) Need satisfaction has a mediating effect on the relationship between learning climate and student engagement; and (H3) Need dissatisfaction has a mediating effect on the relationship between learning climate and student engagement.

Method

Participants

The participants of the study comprised of students hailing from ten universities (five public and five private) in Pakistan. The rationale for the selection of these universities is based on the consideration that the targeted universities transited to online classes for their degree programs after closure of the physical campus in light of the directives from Higher Education Commission (HEC) of Pakistan. Students, as research participants were randomly sampled based on an important consideration. Previously, universities were exclusively engaged in face-to-face learning, so the sudden transition to online learning during the pandemic offers unforeseeable and unprecedented challenges, not only for management

Table 1
Demographic information

	Gender Frequency	Percent
Male	393	57.0
Female	296	43.0
Total	689	100.0
	Age Frequency	Percent
18−22	327	47.5
23−27	207	30.0
28 and Above	155	22.5
Total	689	100.0
	Education Level Frequency	Percent
Bachelors	310	45.0
Masters	220	32.0
Others	159	23.0
Total	689	100.0
	Type of University Frequency	Percent
Public	395	57.3
Private	294	42.7
Total	689	100.0

but also for students. In order to determine the appropriate sample size to validate the findings from the research model in the study, G * power 3.1.9.2 was used (Faul et al., 2007). We gathered quantitative data from 689 students who responded to the online survey. The demographic detail of participants is presented in Table 1.

Instruments

Learning climate

This scale was adopted from the *Learning Climate Questionnaire* (Williams & Deci, 1996) intended to assess students' views of autonomy supportiveness of the instructor. The present study employed the short version of the questionnaire comprising of six items (Jang et al., 2012). Participants were asked to respond on the five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. A sample item is represented as, "my teacher encourages me to ask questions". The reliability of the scale is computed at Cronbach alpha of .89.

Basic psychological needs (need satisfaction/need dissatisfaction)

This scale was adapted from the BPN scale (Levesque-Bristol et al., 2011) to assess students' views of need satisfaction and need dissatisfaction. The present study employed the shorter version of the questionnaire, comprising of twelve items of *need satisfaction* and six items of *need dissatisfaction* that are applicable to the online learning context (Wang et al., 2019). For the measurement of *need satisfaction*, participants were asked to respond on the five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Whereas, for the measurement of *need dissatisfaction*, participants were asked to respond on the five-point Likert scale ranging from 1 = strongly agree to 5 = strongly disagree. An example for *need satisfaction* is demonstrated as, "I feel a sense of choice and freedom in doing things in online learning". However, an example from the *need dissatisfaction* includes, "I often do not feel very capable in online learning". In order to measure the reliability, the Cronbach alpha for need satisfaction and need dissatisfaction are computed at satisfactory level (*need satisfaction* = .88, *need dissatisfaction* = .89).

Student engagement

This scale was adopted from the Online Student Engagement Scale (Dixson, 2015) to evaluate student engagement in the online learning environment. The present study measured student engagement from four dimensions; skills, emotions, participation,

and performance. Participants were asked to respond on the five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. A sample item from this element includes, "I make sure to study on a regular basis". The reliability of scale was computed at Cronbach alpha of .87.

Procedure

The present study employed a cross-sectional research design. The research participants were invited to participate in a web-based survey between the time period of 20th April 2020 to 20th May 2020. The online survey included an information section that clearly laid out the purpose of research and an ethics section pertaining to data privacy and confidentiality in relation to the collection of data in the study. The rationale for the selection of the web-based survey was defined by two essential considerations. First, the research was conducted during the lockdown period because of the COVID-19 pandemic, so there were severe mobility restrictions which hindered physical access to the participants. Second, the targeted population comprised of a particular set of students who were taking online classes, so these students already had access to the internet. Reaching out to these students via an online survey was the best strategy in these times. The survey link, embedded in an email, was sent to the concerned management authorities of ten universities (five publics and five private) of Pakistan. The relevant teachers and instructors who were engaged in online teaching were requested to share the email and survey link with their students.

Data analysis

In order to perform preliminary data analysis, SPSS 23 was used. For further analysis of testing the validity, reliability, significance, and relevance of path coefficients, the partial least square (PLS-SEM) technique was employed by using SMART PLS 3.0 (Ringle et al., 2015).

In order to evade the potential destructions in data analysis, preliminary analysis was undertaken (Hair et al., 2010). The study has no missing values as web-based surveys reduce the chances of any missing data (Hair et al., 2010). Common method bias was not an issue as VIF values are less than 3.3 (LC = 2.134, NS = 1.997 ND = 2.045, SE = 1.986). Moreover, the findings of multivariate normality test indicate that the data was slightly non-normal, as PLS-SEM is a non-parametric statistical approach and does not require the data to be normally distributed.

Results

As Table 2 indicates, the outer loadings are satisfactory and establish indicator reliability as all values are greater than .50 (Hair et al., 2014). The values of composite reliability as indicated in Table 2 are higher than the recommended value of .70. Hence establishes internal consistency reliability in the data (Hair et al., 2006). From Table 2, it is indicated that the average variance extracted values are greater than .5, that establishes the convergent validity (Hair et al., 2014).

Figure 1 depicts the measurement model extracted from SMART PLS. As presented in Table 3 below, all the HTMT values are less than 0.85 indicating discriminant validity ascertained (Henseler et al., 2015).

After establishment of reliability and validity, next step is to analyze the structural model. Figure 2 exhibits the structural model, which identifies the relationship between exogenous and endogenous latent variables.

This study suggest that the acceptable T-value should be greater than 1.645 at 5% significance level with one-tailed (Hair et al.,

Table 2
Outer Loadings, Composite Reliability and Average Variance Extracted

Construct	Items	Outer Loadings	Composite Reliability	Average Variance Extracted
Learning climate	LC1	0.836	.926	.678
	LC2	0.836		
	LC3	0.738		
	LC4	0.821		
	LC5	0.855		
	LC6	0.849		
Need dissatisfaction	ND1	0.874	.932	.695
	ND2	0.863		
	ND3	0.826		
	ND4	0.802		
	ND5	0.866		
	ND6	0.766		
Need satisfaction	NS1	0.663	.922	.507
	NS10	0.694		
	NS11	0.643		
	NS12	0.629		
	NS2	0.754		
	NS3	0.737		
	NS4	0.736		
	NS5	0.720		
	NS6	0.679		
	NS7	0.728		
	NS8	0.753		
	NS9	0.712		
Student engagement	SE1	0.582	.915	.506
	SE10	0.610		
	SE11	0.662		
	SE12	0.611		
	SE13	0.635		
	SE14	0.710		
	SE15	0.531		
	SE16	0.668		
	SE17	0.608		
	SE18	0.606		
	SE2	0.573		
	SE3	0.522		
	SE4	0.627		
	SE5	0.558		
	SE6	0.627		
	SE7	0.668		
	SE8	0.591		
	SE9	0.616		

Table 3
Discriminant Validity (HTMT)

	1	2	3	4
Learning Climate				
Need Dissatisfaction	0.492			
Need Satisfaction	0.453	0.526		
Student Engagement	0.371	0.452	0.687	

Table 5
Variance explained

Endogenous Latent Variable	R Square	Variance Explained
Need satisfaction	0.176	Weak
Need dissatisfaction	0.212	Moderate
Student engagement	0.425	Moderate

2014) indirect effect of 5% and 95%; and CI should not overlap the zero value (Preacher & Hayes, 2008). Hypothesis 1 predicted that learning climate is positively associated with student engagement. However, Table 4 specifies that learning climate is not significantly associated with student engagement (B = 0.060, t-value 0.981, $p >$ .05) with CI [-0.034, 0.159] which overlaps the zero. Hence, this study rejects H1. Hypothesis 2 predicted that need satisfaction mediates the relationship between learning climate and student engagement. The mediating effect related to need satisfaction on the relationship factor indicate that the indirect effect was signif-

icant (β = 0.228, t- value = 4.222 and $p <$ .05), CI [0.138, 0.314]. Not overlapping zero. Hence, Table 4 indicates that the mediating effect is significant and accepting H2. Hypothesis 3 predicts that need dissatisfaction mediates the relationship between learning climate and student engagement. The mediating effect related to need dissatisfaction on the relationship dimension indicate that the indirect effect was significant (β = 0.036, t- value 2.123 and $p <$ .05), CI [0.021, 0.122]. Not overlapping zero. Hence, Table 4 indicates that the mediating effect is significant and accepting H3.

Table 5 highlights 42.5% of total variance in student engagement, 17.6% in need satisfaction and 21.2% in need dissatisfaction. Hence,

Table 4
Significance and relevance of path coefficients

	Relationship	Beta	Std. Error	T Value	P Values	LCI 5.00%	UCI 95.00%
H1	*Learning Climate → Student Engagement*	0.060	0.061	0.981	0.163	−0.034	0.159
H2	*Learning Climate → Need Satisfaction → Student Engagement*	0.228	0.054	4.222	0.000	0.138	0.314
H3	*Learning Climate → Need Dissatisfaction → Student Engagement*	0.036	0.030	2.123	0.007	0.012	0.122
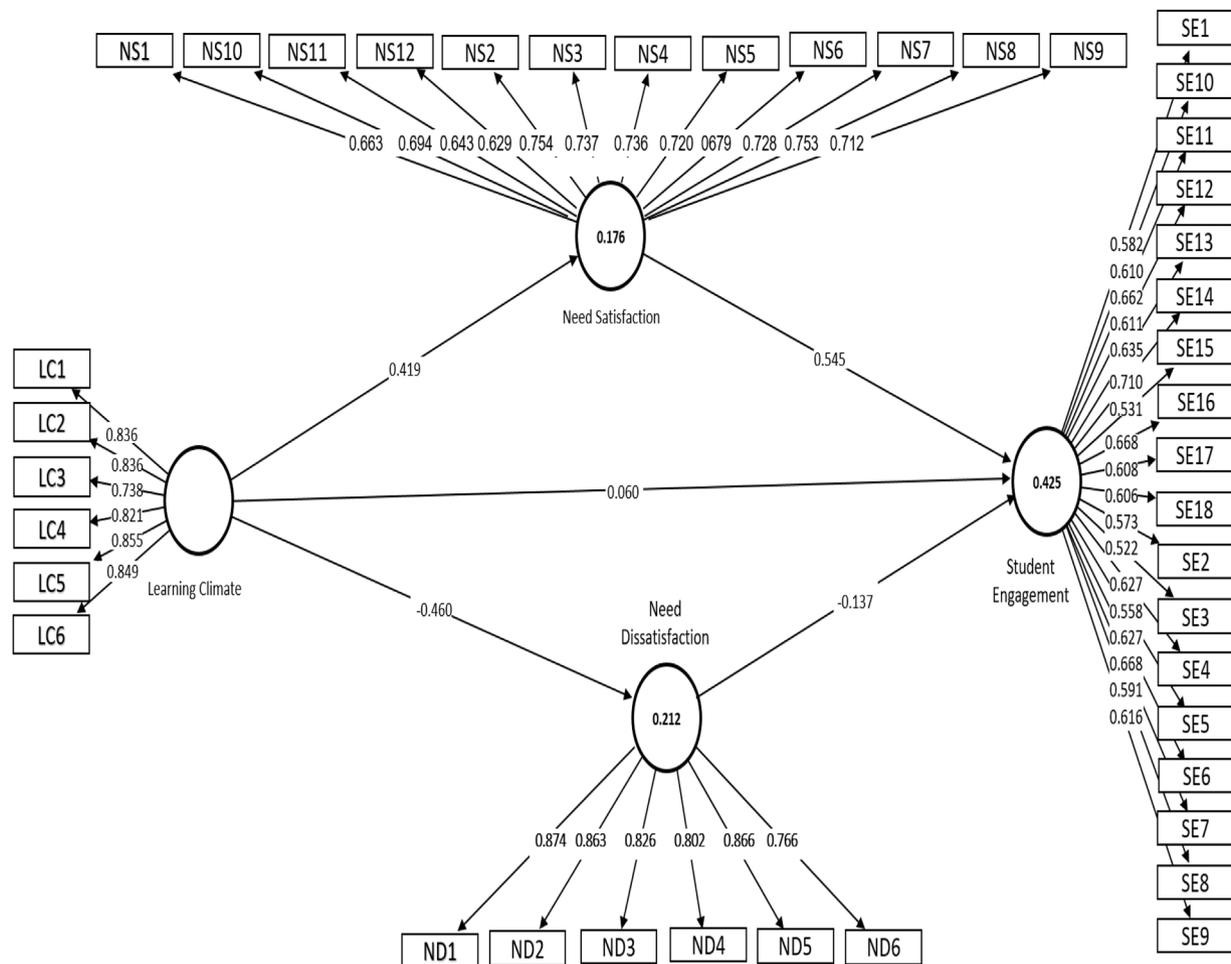
Figure 1. Measurement model.

Table 6
Predictive relevance

Endogenous variables	Q^2 (= 1-SSE/SSO)	Predictive Relevance
Need dissatisfaction	0.157	Moderate
Need satisfaction	0.158	Moderate
Student engagement	0.172	Moderate

Table 7
Predictive power of key endogenous indicator (student engagement)

	PLS		LM		PLS-LM	
	RMSE	MAE	RMSE	MAE	RMSE	MAE
SE18	0.909	0.598	0.925	0.606	−0.016	−0.008
SE9	0.913	0.577	0.914	0.578	−0.001	−0.001
SE13	0.854	0.576	0.858	0.577	−0.004	−0.001
SE4	0.820	0.507	0.833	0.515	−0.013	−0.008
SE16	0.870	0.573	0.886	0.579	−0.016	−0.006
SE5	0.688	0.389	0.701	0.396	−0.013	−0.007
SE1	0.962	0.658	0.968	0.659	−0.006	−0.001
SE3	0.797	0.449	0.803	0.463	−0.006	−0.014
SE6	0.842	0.533	0.850	0.546	−0.008	−0.013
SE11	0.708	0.430	0.718	0.445	−0.010	−0.015
SE8	0.816	0.515	0.832	0.523	−0.016	−0.008
SE12	0.999	0.731	1.007	0.738	−0.008	−0.007
SE15	0.727	0.465	0.742	0.469	−0.015	−0.004
SE17	1.009	0.686	1.018	0.688	−0.009	−0.002
SE14	0.711	0.499	0.720	0.503	−0.009	−0.004
SE10	0.815	0.496	0.829	0.508	−0.014	−0.012
SE2	0.786	0.438	0.803	0.451	−0.017	−0.013
SE7	0.794	0.513	0.799	0.517	−0.005	−0.004

it shows that need satisfaction exhibited a weak level of R-square while need dissatisfaction and student engagement exhibited a moderate level of R-square (Chin, 1998).

The present study has applied the blindfolding procedure by using the omission distance 7 (Hair et al., 2013). Table 6 illustrates the predictive relevance of the model – that is Q square of all endogenous variables is above zero indicating moderate level of predictive relevance (Henseler et al., 2015).

Following the suggestion of Shmueli et al. (2016), we checked the models out of sample predictive power (PLS Predict) of student engagement using 10 folds and 10 repetitions. Based on Table 7, all the errors of the PLS model of student engagement indicators were lower than the Linear Model. This indicates that the present study model has a strong predictive power (Shmueli et al., 2019).

Discussion

Within the framework of SDT, the findings from the study revealed that the direct effect of the learning climate was insignificant for student engagement. This finding suggested that even if students perceive their learning climate as autonomy supportive,

this factor alone could not influence their engagement. This result is seen to be consistent with other recent studies in the online learning context which do not support the direct relationship between the learning climate and learning outcomes (Jang et al., 2016; Wang et al., 2019). Hence, there is a need to realize that instead of putting the sole focus on practicing autonomous learning strategies, there should be a meaningful rationale for offering underlying activities
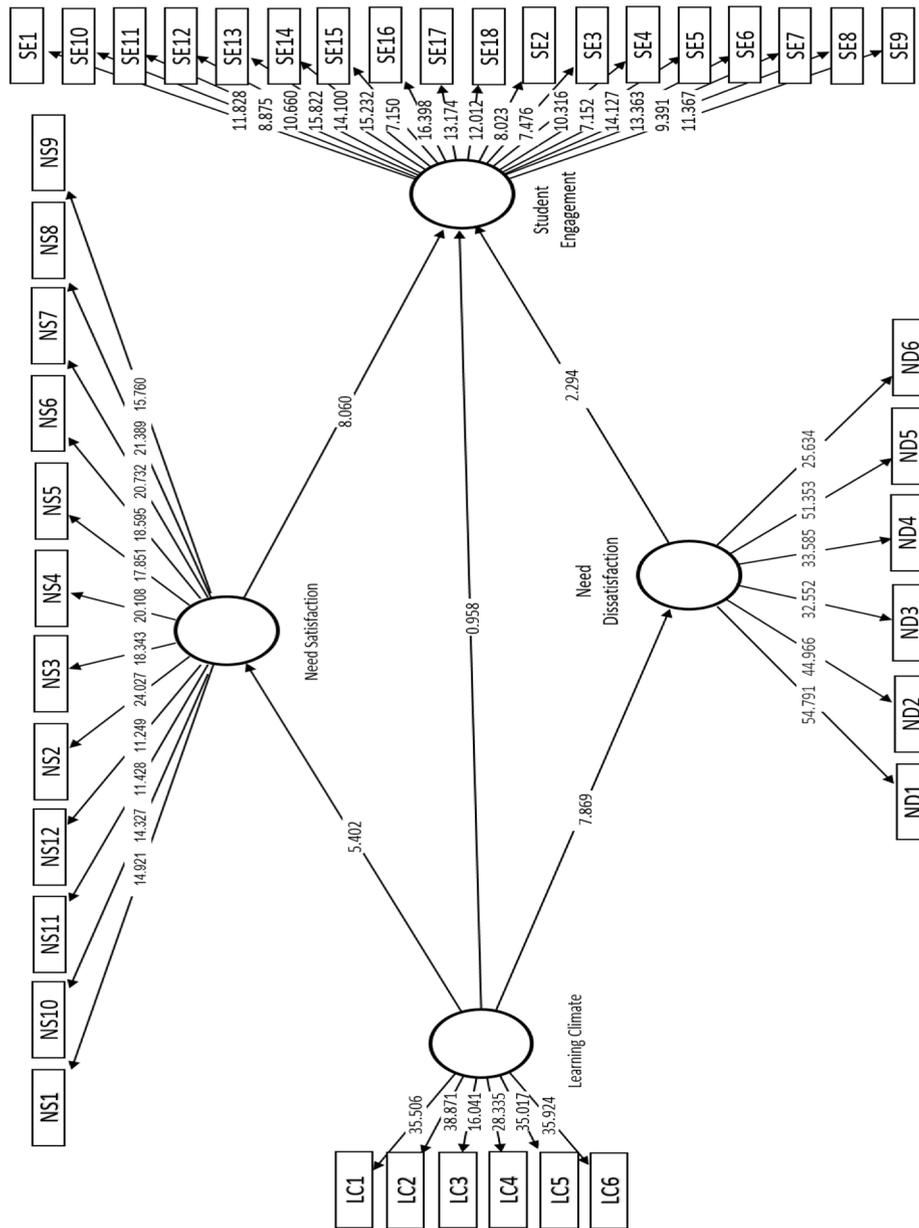
Figure 2. Structural model.

that enhance the value of learning as part of the virtual learning culture. In a similar vein, Chen and Jang (2010) contend that offering a haphazard and aimless learning platform, without considering students' psychological needs, may not necessarily positively contribute towards effective student engagement.

Moreover, we further discuss how the present findings negate the direct influence of the learning climate on student engagement. Nevertheless, this relationship was mediated by students' perceptions concerning to what extent their basic psychological needs were satisfied and/or dissatisfied. These findings are in line with the prior literature that signifies the importance of the face-to-face learning context (Hodges, 2020; Jang et al., 2016). We draw on this discourse that directs our attention in understanding the mediating effects of basic psychological needs and its nexus between the learning climate and students' engagement. This reflects on how student engagement has been interpreted as students' psychological investment that helps in achieving learning outcomes (Durksen et al., 2016; Jang et al., 2016). Furthermore, the findings corroborated that students' engagement was not a direct effect of the autonomy-supportive learning climate, but rather an impact of the influence of the learning climate on students' perceptions of their basic psychological need satisfaction and/or dissatisfaction. Hence, we argue that while instructors need to create an autonomy-supportive learning climate, solely focusing on the learning environment is not adequate to enhance student's engagement. There is growing concern that instructors need to enhance their understanding of student's perceptions of feeling autonomous, competent and relatedness which may effectively reshape the influence of the learning climate on students' engagement.

Furthermore, this study demonstrated that needs dissatisfaction mediated the nexus between the learning climate and students' engagement negatively. In conformity with prior research, the findings evidenced that need satisfaction mediated the nexus between the learning climate and students' engagement positively. However, on the contrary, need dissatisfaction mediated the relationship between the learning climate and students' engagement negatively (Jang et al., 2016). Pertinent to students' need dissatisfaction, we may argue that there is a possibility that the online learning environment may instill certain mixed feelings in students which are directed towards their instructors and learning climate to trigger some forms of dissatisfaction. This may be explained through the vast physical and psychological barriers that may exist between the instructor and online learners. In Pakistan, the common norm is that students of higher education institutes are accustomed to having regular face-to-face interactions with their instructor. However, due to the sudden transition towards online learning, some students may experience psychological dissatisfaction related to the absence of any social and physical interactions (Bowers & Kumar, 2015; Ragusa & Crampton, 2018). Mandernach et al. (2006) argue that on-campus classes offer an instructor driven learning environment, whereas online learning heavily relies on asynchronous communication. This could have adverse effects on student learning and is significantly connected to instructors' communication in the online learning environment. Any inconsistency in students' perceptions may create ambiguities regarding the learning climate and needs satisfaction and dissatisfaction.

Nonetheless, students' perceptions of their need satisfaction and dissatisfaction may either make the learning climate meaningful or irrelevant for them, and consequently, this may have a significant impact on making efforts to perform better (Orsini et al., 2018). This suggests that the influence of the online learning climate on students' engagement draws strength from the mediating influence of need satisfaction and need dissatisfaction. Hence, we contend that the present study endorses the positive and negative aspects of basic psychological needs, in terms of needs satisfaction and dissatisfaction, which should be studied distinctively because both

attributes draw on idiosyncratic consequences that may have differential influences on students' learning outcomes (Vansteenkiste & Ryan, 2013; Wang et al., 2019).

In the context of this study, we acknowledge that initially students were expected to complete their studies physically on campus, but due to the emergence of the COVID-19 pandemic, the shift to online teaching platforms has presented some unique challenges. We must understand that the adoption of online learning will take some time to become the 'new normal' as students gradually fully embrace the new learning environment with its associated dynamics and complexities. This 'new normal' entails that instructors should offer customized support to their students in effectively adjusting to online learning and pedagogical approaches. The consideration from instructors in recognizing students' individual psychological needs may mitigate ambiguity and anxiety for many students and perhaps be the first step for students to have a meaningful and constructive online learning experience.

Conclusion

The study concludes that if the learning climate is constructed and designed in a manner that satisfies students' basic psychological needs, it may stimulate greater student engagement to get the best out of the online learning context through effective pedagogical practices. Whilst we note that online learning for many university students in Pakistan is still a novel learning experience on its own, it requires a transition period to adjust to this distinctive setting. Here, it is pertinent to mention that due to the sharp rise and widespread penetration of the number of coronavirus cases reported in Pakistan, students are already suffering some degree of psychological distress. Hence, focusing on education during these unprecedented times poses other severe challenges and pressures for students. It is worthy to say that amidst this global health crisis, students' mental health and well-being should take precedence over rising educational demands. By paying more heed towards satisfying students' basic psychological needs will not only make their online learning experience more fruitful and positive, but will also make them more resilient in facing future similar challenges.

The study findings endorse the relevancy and applicability of SDT in 'new normal'. The empirical findings from this study are valid and generalizable across other developing country contexts. The practical implications from this study inform policy-makers, academics and practitioners to reflect on current teaching practices and policies. The Higher Education Commission of Pakistan should design specific training programs for faculty members to develop their online teaching skills and facilitate them with interactive online pedagogical teaching tools. Educators can use the virtual environment to empower students and give them more autonomy in completing their tasks online. Such platforms provide more interactive and personalized approaches to respond to student queries to make them feel more connected. Faculty members may receive regular feedback from students to continuously improve their online teaching practices. Furthermore, enhanced student engagement through online learning tools may help boost students' academic performance as educators become more sensitive to their psychological needs and mental well-being during the tough period of the COVID-19 pandemic.

Like all studies despite taking efforts to enhance rigor in the work, the present study also has some limitations. First, although the integrated SEM research model was employed to study the relationship between variables, caution is required to draw inferences concerning the causal relationships between the variables in relation to the cross-sectional nature of this study. This calls for longitudinal studies to be conducted in future in order to cross validate the current findings. Second, this study was based on self-reported data which were collected only from students and dismissed teach-

ers' perspective. Future studies may employ a cross comparison of data collected both from students and teachers to gain a better sense of understanding. Third, the present study focused on the predictive variable within the online learning climate. Nevertheless, there is ample direction for future research to examine other variables that may positively or negatively impact on students' other psychological needs and its effect on their engagement levels in similar virtual environments. This may steer new directions for the implementation of evidence based strategies to facilitate students in gaining desired results and performance outcomes from the new normal.

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