

# Online learning during the COVID-19 pandemic: applying the self-determination theory in the ‘new normal’

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## Abstract

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 10 (5 publics and 5 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.

**Keywords:** *COVID-19 pandemic, basic psychological needs, online learning, self-determination theory, learning climate, student engagement.*

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## 1. 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, Aldholay, Abdullah, & Ramayah, 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.

## **2. Literature Review and Hypothesis Development**

### ***2.1 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 (Niemic & 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, Sampson, & Pelliccione, 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.

### ***2.2 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, Lin, & Kwon, 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, Abawi, Brown, Henderson, & Heffernan, 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, Abawi, Brown, Henderson, & Heffernan, 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, Lin, & Kwon, 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, Lin, & Kwon, 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.

### ***2.3 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, Chu, Ahmad, Radil, & Daniels, 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, Kim, & Reeve, 2016; Orsini, Binnie, Wilson, & Villegas, 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 unfulfilment 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, Binnie, Wilson, & Villegas, 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, Ntoumanis, & Bartholomew, 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, Rodríguez-Medellín, Pérez-García, Otero-Saborido, & Delgado, 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, Sell, and Zimmerman (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.

H3. Need dissatisfaction has a mediating effect on the relationship between learning climate and student engagement.

### **3. Methods**

#### ***3.1 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 transitioned 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 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, Erdfelder, Lang, & Buchner, 2007). We gathered quantitative data from 689 students who responded to the online survey. The demographic detail of participants is presented in Table 1.

Table 1: Demographic

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

### 3.2 Measures

#### *Learning Climate*

This scale was adopted from the Learning Climate Questionnaire (Williams and 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, Kim, and Reeve, 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 0.890.

#### *Basic psychological needs (Need satisfaction / Need dissatisfaction)*

This scale was adapted from the BPN scale (Levesque-Bristol, Knapp, and Fisher, 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 = 0.887; need dissatisfaction = 0.898).

### ***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 0.876.

### ***3.3 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 20<sup>th</sup> April 2020 to 20<sup>th</sup> 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.

## **4. 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, Wende, & Becker, 2015).

### ***4.1 Preliminary Analysis***

In order to evade the potential destructions in data analysis, preliminary analysis was undertaken (Hair, Black, Babin, & Tatham, 2010). The study has no missing values as web-based surveys reduce the chances of any missing data (Hair, Black, Babin, & Tatham, 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.

### **Measurement Model**

As Table 2 indicates, the outer loadings are satisfactory and establish indicator reliability as all values are greater than 0.50 (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). The values of composite reliability as indicated in Table 2 are higher than the recommended value of 0.7. Hence establishes internal consistency reliability in the data (Hair, Black, Babin, Anderson, & Tatham, 2006). From Table 2, it is indicated that the average variance extracted values are greater than 0.5, that establishes the convergent validity (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014).

Table 2: Outer Loadings, Composite Reliability and Average Variance Extracted



<b>Construct</b>	<b>Items</b>	<b>Outer Loadings</b>	<b>Composite Reliability</b>	<b>Average Variance Extracted</b>
<i>Learning Climate</i>	LC1	0.836	0.926	0.678
	LC2	0.836		
	LC3	0.738		
	LC4	0.821		
	LC5	0.855		
	LC6	0.849		
<i>Need Dissatisfaction</i>	ND1	0.874	0.932	0.695
	ND2	0.863		
	ND3	0.826		
	ND4	0.802		
	ND5	0.866		
	ND6	0.766		
<i>Need Satisfaction</i>	NS1	0.663	0.922	0.507
	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			
<i>Student Engagement</i>	NS9	0.712	0.915	0.506
	SE1	0.582		
	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			

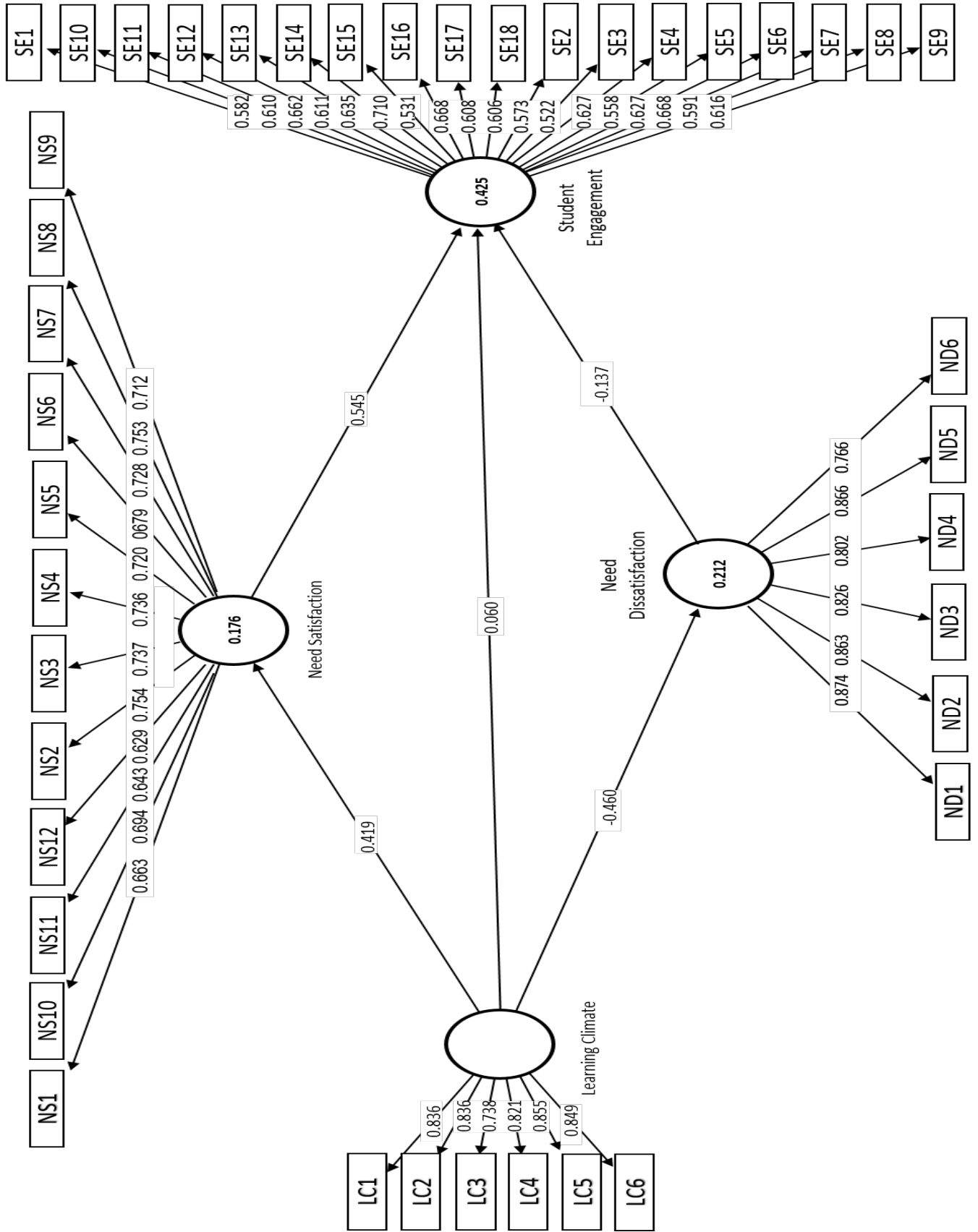


Figure 1: Measurement Model

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, Ringle, & Sarstedt, 2015).

Table 3: Discriminant Validity (HTMT)

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

### **Structural Model**

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.

Table 4: Significance and Relevance of Path Coefficients

Relationship	Beta	Std. Error	T Value	P Values	LCI 5.00%	UCI 95.00%
<b>H1</b> <i>Learning Climate</i> → <i>Student Engagement</i>	0.060	0.061	0.981	0.163	-0.034	0.159
<b>H2</b> <i>Learning Climate</i> → <i>Need Satisfaction</i> → <i>Student Engagement</i>	0.228	0.054	4.222	0.000	0.138	0.314
<b>H3</b> <i>Learning Climate</i> → <i>Need Dissatisfaction</i> → <i>Student Engagement</i>	0.036	0.030	2.123	0.007	0.012	0.122

This study suggest that the acceptable T-value should be greater than 1.645 at 5% significance level with one-tailed (Hair, Sarstedt, Hopkins, & Kuppelwieser, 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,  $p>0.05$ ) 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 significant ( $\beta = 0.228$ ,  $t$ -value= 4.222 and  $p < 0.05$ ), 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 ( $\beta = 0.036$ ,  $t$ -value 2.123 and  $p < 0.05$ ), CI [0.021, 0.122]. Not overlapping zero. Hence, Table 4 indicates that the mediating effect is significant and accepting H3.

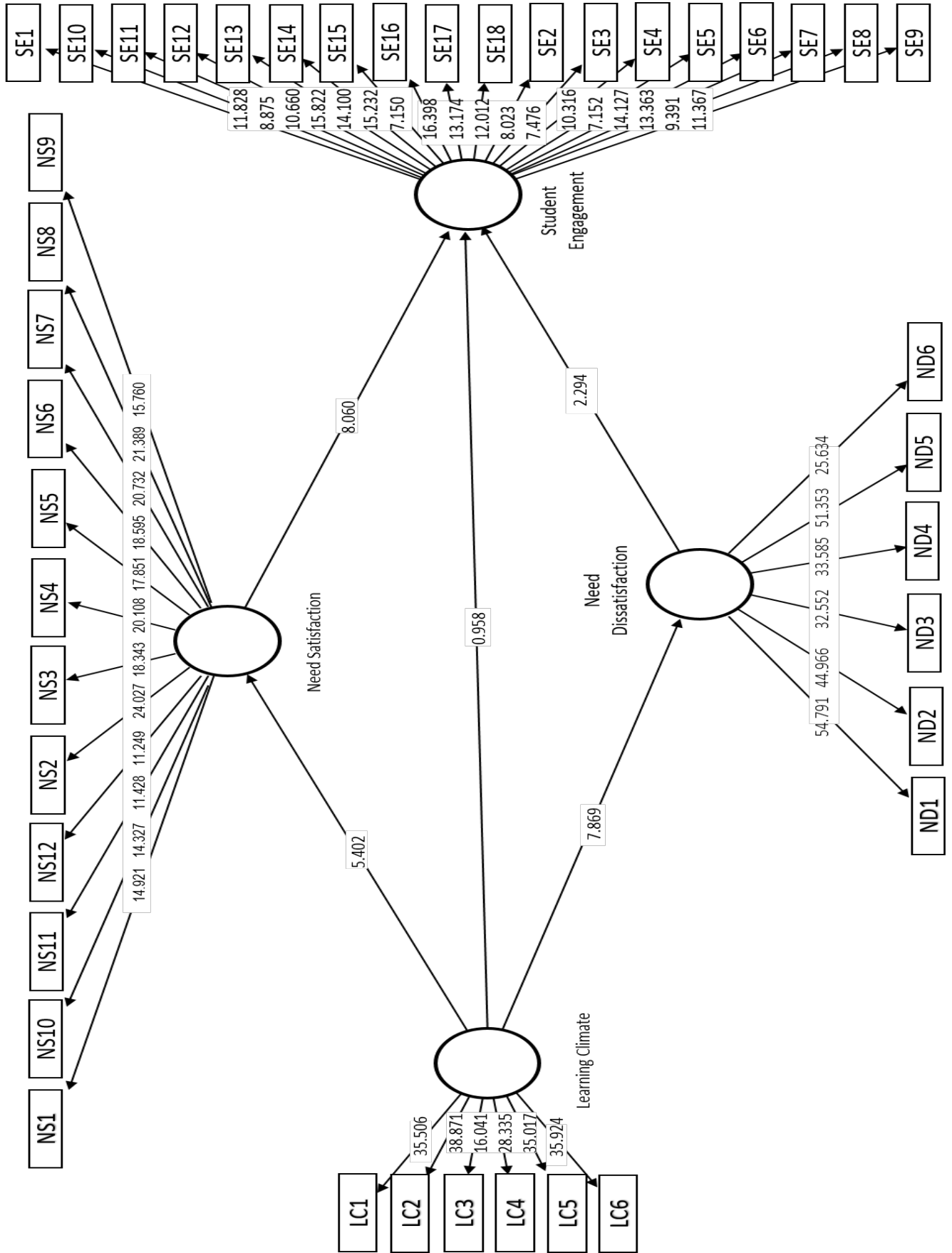


Figure 2: Structural Model

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

Table 5: Variance Explained

<b>Endogenous Latent Variable</b>	<b>R Square</b>	<b>Variance Explained</b>
<i>Need Satisfaction</i>	0.176	Weak
<i>Need Dissatisfaction</i>	0.212	Moderate
<i>Student Engagement</i>	0.425	Moderate

The present study has applied the blindfolding procedure by using the omission distance 7 (Hair, Ringle, & Sarstedt, 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, Ringle, & Sinkovics, 2015).

Table 6: Predictive Relevance

<b>Endogenous variables</b>	<b>Q<sup>2</sup> (=1-SSE/SSO)</b>	<b>Predictive Relevance</b>
<i>Need Dissatisfaction</i>	0.157	Moderate
<i>Need Satisfaction</i>	0.158	Moderate
<i>Student Engagement</i>	0.172	Moderate

Following the suggestion of Shmueli, Ray, Estrada, and Chatla (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).

Table 7: Predictive Power of Key Endogenous Indicator (*Student Engagement*)

	<b>PLS</b>		<b>LM</b>		<b>PLS-LM</b>	
	<b>RMSE</b>	<b>MAE</b>	<b>RMSE</b>	<b>MAE</b>	<b>RMSE</b>	<b>MAE</b>
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

## 5. 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, Kim, & Reeve, 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 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, Kim, & Reeve, 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, Chu, Ahmad, Radil, & Daniels, 2016; Jang, Kim, & Reeve, 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, Kim, & Reeve, 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, Gonzales, and Garrett (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, Binnie, Wilson, & Villegas, 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.

## **6. 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 teachers' 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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