Online Learning Stress as A Moderator Between Learning Readiness, Learning Attitude, and Learning Students' Mental Psychological Performance: A Covid-19 Perception-Based View

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Abstract
After experiencing the COVID-19 pandemic, educational institutions have to shift their academic activities from manual to the online pattern. Online academic activities may cause attitudinal and behavioral changes in students' learning patterns. With the support of self-determination theory, the present study attempts to determine the role of the online learning climate in students' performance. In addition, the current study also tries to determine the impact of the online learning climate on students' learning readiness and learning attitude. Moreover, this study also attempts to determine the mediating role of learning readiness and learning attitude in the relationship between online learning climate and students' performance. To determine the moderating role of online learning stress in the relationship between learning reediness and student performance and between learning attitude and student performance is also an important objective of the current study. For empirical investigation, this study collected the data from 426 sports online learning students of different universities in China. The present study applied partial least square structural equation modeling for empirical analyses using Smart PLS software. The present study's findings acknowledge that online learning climate did not directly influence students' performance; however, online learning climate has positive associations with learning readiness and learning attitude, respectively. Additionally, the present study's outcomes confirm that learning readiness and learning attitude positively mediate the relationship between online learning climate and students' performance, respectively. The present study's findings also revealed that online learning stress negatively moderates the relationship between learning readiness and student performance but does not moderate the relationship between learning attitude and student performance. The present study's findings also offer essential practical, theoretical, and managerial implications.

Keywords: Online learning climate, learning readiness, Learning attitude, Online learning stress, Students performance

1 Introduction

In this modern era, inventive technology has introduced interactive media education, which has made it easier to understand the learning environment (Lee, 2010). Students' performance may increase by the online learning climate because they may attend their classes anytime and anywhere. The opportunity of online learning can be successful for the students to increase their work engagement. Due to covid-19 online learning climate may necessary for everyone; it can help to maintain social distance and also recovers the loss of studies. The previous study found that in numerous nations, face-to-face schooling and exams have been postponed because of the Covid-19 crisis (Gonzalez et al., 2020). Further, Students who are the most crucial component of this current period, are concerned about their careers. To address these concerns, online learning begins to provide lectures, meetings, and presentations in an open friendly climate (Gonzalez et al., 2020; Iglesias-Pradas et al., 2021). Students have recovered from the stress of covid-19 and have participated in regular online learning. They can learn about the implications of new technologies ahead of time with the help of OLC.

Sports students may take advantage of online learning. They can do their sports practices carefully without the stress of losing study. After practicing they can attend their classes online in a friendly environment. They can also learn about new sports practice methods on the internet, which may help them improve their performance. During sports activities, they may feel liberated and free of study burden.

The previous study pointed out that, communication particularly in the educational sector must be explored between instructors and students because students has the potential to promote learning and create a positive learning environment (Alawamleh, Al-Twait, & Al-Saht, 2020). Further, in the online learning phase, effective communication is very necessary between instructors and students for improved outcomes. Performance is an important component for all institutions, not only educational ones. The backbone of the institutions is the simply incredible performance that represents the name of their institution everywhere. In addition, if the online learning climate may have a positive impact on students they can perform better than face to face learning method. The prior study indicates that some

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students may prefer to choose online education over a face-to-face course, and they feel much more comfortable with the online platform (Cole et al., 2017). Further, the performance of OLC and face-to-face learners varies depending on their motivations. Students who are more interested in online learning may perform better than students who are not. OLC can be more successful if youngsters are probably interested in computers, web-based instructions, and innovative ways to learn unique ideas by themselves. Organizational targets can be difficult in the future, they may pick those individuals who are familiar with technology because business approaches will be difficult.

Furthermore, the relationship between OLC and student performance is investigated by using mediators of learning readiness and learning attitude. The Author proposed the concept of online learning readiness (Smith, Murphy, & Mahoney, 2003) refers to how eager students are to learn anything new regardless of circumstances or climate conditions. A student with a high readiness level may do better perform than a student with a low readiness level (Wei & Chou, 2020). In this study, OLC has a good influence on learning readiness, which can improve performance. If the online learning climate may be successful to attract the students, it can help to increase the performance whereas the negative learning attitude can be decreased. Students may prefer to learn through a convenient approach rather than going to universities during the pandemic period.

According to Molinari, Dupler, and Lungstrom (2005), stress is an undefined physiological response to adverse situations. Learning stress has not been well understood. If stress affects physical and emotional well-being, and ultimate learning is required to live in the information age, the stress may have an impact on online learning and educational practice. Students actually missed the interaction with other students and experienced stress (Knowles & Kerkman, 2007). Further, stress can be increased if the internet connection creates problems during lectures. The current study represents that online learning stress negatively moderates the two relationships: first moderating the relationship between learning readiness and student performance. Second, learning attitude and student performance are moderated by the online learning stress. Students who participate in more sports activities are more likely to be stressed out in course work. They might not perform well due to the stress. Students' learning capabilities and attitudes toward performance may be significantly harmed by stress.

Drawing on self-determination theory (Ryan & Deci, 2017) online learning climate (OLC) increases the individual's motivations through the fulfillment of their intrinsic needs on time. It is a motivational theory and it elaborates that when students are satisfied with the OLC they may perform outstanding (Ferrer et al., 2020). "Self-determination emphasizes the human desire to fulfill three core psychological needs, namely; autonomy, competence, and relatedness" (Shah et al., 2021). Because performance is based on online learning, this theory determined that OLC and student performance have a reciprocal relationship. If OLC fails to engage the students, performance may deteriorate. According to the self-determination theory, if OLC does not motivate students or meet their intended study needs, they may not participate in lectures or other online activities. As a result of their lack of enthusiasm, students may perform poorly. In order to achieve success, every educational sector aims to maximize students' performance and develop close collaboration between instructors and students.

The objective of the current study examined the relationship between online learning climate (OLC) and students' performance. There are three objectives of this study; first, is to investigate the relationship between OLS and student performance; and second, to examine the mediating role of learning attitude and learning readiness between OLC and student performance; third, to examine the moderator role of online learning stress between OLC and students' performance. The following research questions were developed to help attain these goals. What is the relation between OLC and student performance? How do learning readiness and learning attitude mediate the relationship? What is the impact of online learner stress on learner readiness and learner attitude towards students' performance? This study examines how OLC affects student performance in educational institutions. When learners begin to engage in OLC, their performance will be improve. To fill this gap, we want to look into why students prefer online learning and what is the effect of OLC on performance outcomes. This research focuses on the development of the OLC and its significant effects on performance with the use of technology.

2 Literature Review

2.1 Online Learning Climate

OLC and face-to-face climate have their own perspectives. The previous research defined that, according to OLC "A perceived connection to, rapport with, or affinity with the teacher and students within a mediated or online class" (Cole, Lennon, & Weber, 2021). Instructors' presence becomes more important in the online learning environment because it provides a key link for students who are separated from their teachers by time and distance (Orcutt & Dringus, 2017). Further, the instructor's interest is mandatory to create a positive and attractive learning environment. Instructors should engage all the students and use multiple formats to deliver the lectures. Otherwise, a lack of interest can be reduced the motivational level of students and they feel stress due to incomplete course work. According to various

studies, students in online courses feel alienated from both the instructor and their peers, as well as confused or upset with course content and tasks due to a lack of connection (Kaufmann, Sellnow, & Frisby, 2016). Although some researchers argue that to develop a virtual learning environment, instructors should establish an online social presence and open communication to enhance the students' performance (Gunawardena & Zittle, 1997; Kaufmann et al., 2016).
The previous study found that online courses that emphasize social interaction are more important to the students (Swan & Shih, 2005). Instructors must be fully motivated to give the desired educational productivity (Alawamleh et al., 2020). Learning climate is depends on the instructors' interest among students. Due to the covid-19 pandemic variants, social distance is very necessary to overcome the negative climate change. Further, online learning has a giant role to continue educational activities (Moustakas & Robrade, 2022; Sammut, 2021). With the support of the OLC, students' grades improved dramatically, and they had no difficulties finishing their courses.

2.2 Student Performance

"The performance expectancy is the degree to which a person believes that adopting a system would aid in achieving a performance improvement, and it encompasses the idea of constructs. Extrinsic drive, work fit, relative advantage, and perceived usefulness as well as anticipated outcomes" (Panigrahi, Srivastava, & Sharma, 2018). Further, the usage of OLC assisted instruction in a blended learning environment has been found to boost student performance. Student performance was increased by the OLC without taking health risks. OLC and student performance are based on instructors' loyalty, behavior and environment. According to the psychological contract mutual trust (between instructor and students) enhances a positive learning environment. If instructors devote adequate time to their students, they will definitely perform. The preliminary studies examined that "psychological contracts as a form of mutual exchange in the education process" (Chernyaeva et al., 2009; Jambulingam & Saxton, 2021). Academic staffs who expect superior performance from certain students pay more attention to them, while average students are demotivated by the teacher's unethical behavior. The OLC makes them easier to learn and perform equally.
Sports students face more academic issues than other students even though they spend all of their time participating in sports activities. During Covid-19, institute of higher education began using an online learning system to involve learners, but, the course work of sports students is intricate, making it more difficult to understand but an online system make it easy for them that can be effect direct or indirect on the performance (Chernyaeva et al., 2009). In addition, Sports students' learning styles are more energetic, and they are sharped to focus on their courses while online. The OLC is very helpful for sports learning students. In today's world, employers want students who do more than just show up for class and then go. Instead, they choose students who excel academically and participate in extracurricular activities (Mohd Daud et al., 2013). Based on the help of the above-mentioned arguments the present study proposed that:
***H1**: Online learning climate has a positive association with student performance.*

2.3 Online Learning Climate and Learning Readiness

"Online learning readiness refers to an institution's or an individual's ability to benefit from the advantages of online learning" (Lopez, 2007). Another author said that online learning readiness as the ability of participants to use online learning resources and communications technologies to promote learning quality (Abas, Kaur, & Harun, 2004).
In recent history, industry and educational institutions have increasingly embraced online learning, with even difficult meetings, presentations, and conversations now preferring to take place online. In educational institutions, the shift from face-to-face to online learning is happening quickly (Aldhafeeri & Khan, 2016; Hergüner et al., 2021). There is no time and space restriction. OLC allows young people to join their communities from anywhere, making life easier and reducing the risk of covid 19. Students will have multiple opportunities to listen to lectures anytime and anywhere at OLC (Brecht & Ogilby, 2008; Du et al., 2022; Hergüner et al., 2021; Hwang, Wang, & Lai, 2021). Online readiness refers to the participant's physical and mental preparation to learn online (Hergüner et al., 2021; Iglesias-Pradas et al., 2021). Students must be encouraged to study even though they will not be able to perform to their full potential if they are not mentally or physically prepared (Artino Jr, 2009; Kruger-Ross & Waters, 2013). The level of preparation has a direct impact to improve OLC and better performance.
According to the previous study, there are two characteristics of online readiness (Demir Kaymak & Horzum, 2013; Warner, Authority, & Choy, 1998). The first is technology, while the second is students. Additionally, students rely on technology to make innovative solutions to problems. Students must have practical knowledge of technology. A positive association between online learner climate (OLC) and online learners' readiness was discovered in the current study.
***H2**: Online learning climate has a positive association with learning readiness.*

2.4 Online Learning Climate and Learning Attitude

The previous findings indicate that attitude is a critical aspect in achieving positive outcomes in an online situation (Ferrer et al., 2020; Liaw, Chen, & Huang, 2008). Students' attitudes regarding online learning have been discovered in previous polls. Students that have a good attitude toward online learning do better

as they satisfy the expectations of teachers (Ferrer et al., 2020; Liaw et al., 2008). Furthermore, students' future may be jeopardized by a pessimistic attitude. Learners' attitudes are also influenced by OLC, since if the online environment is welcoming, engaging, and simple to perceive, students' attitudes about the learning process may change. The learning climate has a direct impact on an individual's attitude toward performance (Herguner et al., 2020; Lee, Qu, & Kim, 2007).

Self-regulated learning (SRL) is a notion in which students are actively involved in and accountable for their learning process, as well as competent, self-aware, and able to choose their own learning style (Halili & Zainuddin, 2015). SRL was shown to have a considerable impact on academic performance and learning performance across several studies. In this context, students' attitudes toward performance are directly tied to the OLC. The learning environment, adaptability, and performance are all affected by one's attitude (Herguner et al., 2020).

H3: *Online learning climate has a positive association with a learning attitude.*

2.5 Learning Readiness and Learning Attitude as a Mediator

"Readiness for online learning is defined as mental or physical readiness of an organization or individual for learning experiences" (Borotis & Poulymenakou, 2004; Ramadhanu et al., 2019). Another author said that the competence or readiness of students to use information technology determines by the level of student interaction (Ramadhanu et al., 2019). As a result, OLC requires special attention in order to improve students' readiness and performance. In this study, learner readiness is mediating the relationship between OLC and student performance. In addition, teachers and students, as well as students and their peers, can benefit from online learning. By efficiently facilitating communication, they can synergize throughout the learning process. Students' engagement is a crucial part of satisfaction and satisfaction comes from positive performance. Furthermore, student satisfaction is linked to learner performance, full involvement, and team cooperative learning (Zhai et al., 2017). Quality work has a huge impact on performance everywhere. The Author said that "satisfaction is the desired outcome of any aim that amuses any individual's admiration" (Kotler & Clarke, 1987). Moreover, an attitude is an emotion, belief, or view of acceptance or dissatisfaction toward something.

Students who have a positive attitude towards online learning are more likely to see personal benefits from it (Ferrer et al., 2020). However, students' motivation, talent, and ability to understand the learning framework will lead to their accepting the online learning climate and performing better than before (Ramadhanu et al., 2019). Attitude and behavior are important for performance. In other words, having a pleasant attitude and behavior will benefit both performance and online learning (Ramadhanu et al., 2019). Further, these factors are important for online learning: social influence, performance expectancy, effort expectancy, and facilitating conditions. In this study, OLC and student performance are positively mediated by learning readiness and learning attitude. As a result of the above arguments we arrived at the following hypothesis;

H4: *Learning readiness positively mediates the relationship between online learning climate and student performance.*

H5: *Learning attitude positively mediates the relationship between online learning climate and student performance.*

2.6 Online learning stress as a Moderator

According to Molinari et al. (2005), stress is an undefined physiological response to adverse situations. Learning stress has not been well understood. Because of the pandemic, the educational system has been altered. Earlier, classes were conducted face to face, but online learning is now used to deliver lectures. This abrupt change stresses students because they were not prepared to adopt an online learning approach (Wahyu & Simanullang, 2020). Stress is a negative aspect that can impair an individual's performance.

Stress has a negative impact on self-efficacy, which reduces an individual's ability to perform. Individuals with high self-efficacy outperformed others. Stress reduced satisfaction and self-confidence and performance related to both (Engin, 2017). Stress is contains on the two components, that is physical and psychological. Physical stress damaged the activeness of body like headache, while psychological stress caused by an individual's emotions and perceptions (Shankar & Park, 2016). Further, stress can reduce work efficacy that can be lead to poor performance. Online learning stress negatively moderates the association between learning readiness and student performance.

H6: *Online learning stress negatively moderates the relationship between learning readiness and student performance.*

2.7 Online Learning Stress and Learning Attitude and Performance

In educational sectors when the climate is much more matter than academics. The current study discussed that OLC is having a positive impact on students learning attitude but stress can change the attitude that will be negative effect on performance. when the internet is inaccessible or slow students feel stressed and lack of confidence when submitting assignments and taking online exams because they are more concerned with their studies (Siddiqui, Shah, & Ariser, 2021). As a result, individuals have a bad attitude toward online systems and they are unable to perform accurately. By considering the above literature, the present study hypothesized the following:

H7: *Online learning stress negatively moderates the relationship between learning attitude and student performance.*

Figure 1 explains the present study framework and proposed relationships between the variables.

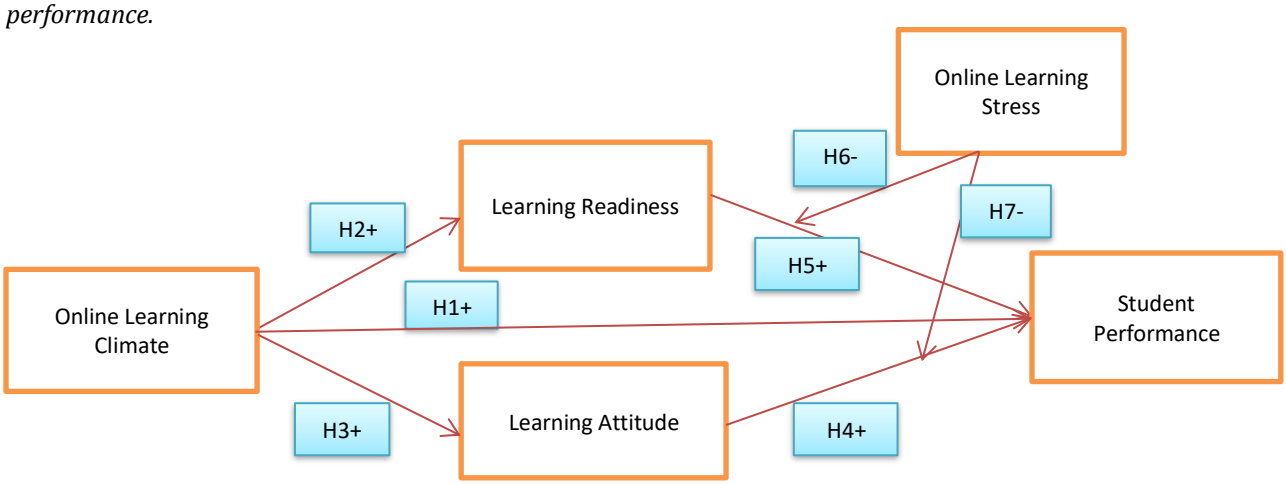

Figure 1. Conceptual framework

3 Research Methods

3.1 Study design

This study collected data from sports online learning students of different universities in China. The Author visited various universities and confirmed that during COVID-19, these universities were provided sports learning online. Almost every university was involved in online learning during COVID-19. The Author met with the sports learning department heads for the collection of data. The purpose of data collection of this study was purely for academic purposes, and the target population was also from educational institutions. Thus, the Author did not face the hurdle of getting permission for data collection.

The questionnaires consist of two languages such as English and Chinese. Frist, developed in English and then translated into Chinese under the senior researchers' guidance. Sample data was also collected for the correction of language. In this way, the Author finalized the language of the questionnaires. The Author developed questionnaires based on a cover letter. The cover letter assured the students about their data privacy, as data will be used just for research purposes, and accumulated outcomes will be revealed. Moreover, the cover letter also assured the students that no answers are right or wrong, so their true answers will be considered right for this study. Hence, avoid consultation while filling out questionnaires. This step booted the confidence of the employees.

The Author also applied the time lag data approach for data collection as this approach is useful to reduce common method bias. Hence, questionnaires were developed based on a hidden code to verify the same respondents in all waves. The Author distributed questionnaires in four waves. Wave one included variable online learning climate; wave two included variables learning readiness and learning attitude; wave three included variable student performance, and wave four included variable online learning stress. The Author applied a convenience sampling technique for data collection.

The Author distributed 700 questionnaires to students in the first wave and received 712 complete responses. The Author collected 606 valid and complete questionnaires from students in the second wave. In the third wave, the Author received 488 valid and complete questionnaires. In this fourth wave, the Author got back 426 valid and complete questionnaires for data collection. Hence, the sample size of this study is based on 426 participants.

3.2 Measures

This study used five points Likert scale to measure the participants' responses. This scale consists of five numbers where 1 considered "strongly disagree," 2 considered "disagree," 3 considered "neutral," 4 considered "agree," and 5 considered "strongly agree." This study assessed data from previously validated items.

3.2.1 Online Learning Climate

The construct online learning climate was measured with 15 items scale adapted from Cole et al. (2021). The sample item included, "Based on my experiences with and perceptions of this course: The design of this course encourages student interaction with students."

3.2.2 Learning Readiness

The construct learning readiness was measured with 18 items scale adopted from Hung et al. (2010). The sample item included, "I seek assistance when facing learning problems."

3.2.3 Learning Attitude

The construct learning attitude was measured with five items scale adopted from Pierce, Stacey, and Barkatsas (2007). The sample item included, "Online learning is more interesting when studying sport lectures."

3.2.4 Online Learning Stress

The construct online learning stress was measured with four items scale adopted from Warttig et al. (2013). The sample item included, "In the last month how often have you felt nervous and 'stressed'?"

3.2.5 Students Performance

The construct student performance was measured with four items scale adopted from Yousef (2000). This scale measured the student productivity in the class. The sample item included, "To what extent do you agree that you perform better than your other class fellows."

4 Results

4.1 Software applied

The present study applied the variance-based partial least squares structural equation modeling (PLS-SEM) technique instead of other co-variance-based techniques such as AMOS. The basic purpose behind this selection is the effectiveness of PLS-SEM for both types of studies (confirmatory and exploratory) (Hair, Ringle, & Sarstedt, 2011). Structural equation modeling (SEM) consists of two different types, which include covariance-based (CB-SEM) and PLS-SEM (Hair, Risher, et al., 2019). The key difference in both methods is that CB-SEM is considered for theory acceptance and rejection, while PLS-SEM is considered for advancing and developing the theories (Alawamleh et al., 2020; Iglesias-Pradas et al., 2021). PLS-SEM is a very appropriate approach for complex and multi-orders-based models. PLS-SEM is also very useful for evaluating small data sets (Hair et al., 2017). Hence, the present study considers the PLS-SEM method for empirical data analyses using Smart PLS 3.3.3 software. The results of PLS-SEM-based analysis are evaluated in two stages, including model measurement and structural model evaluation.

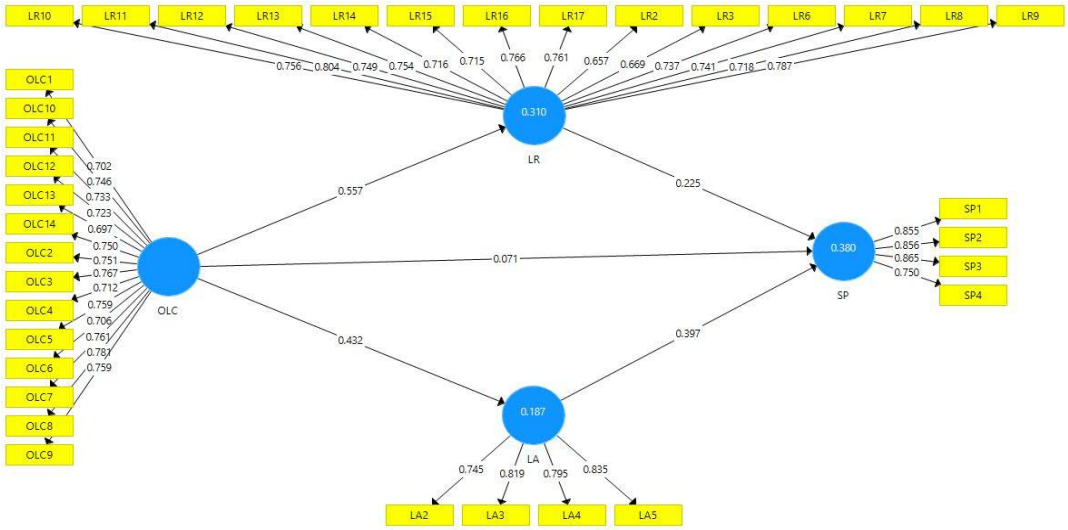

Figure-2 Path estimates

Table-1

Reliability and Convergent Validity of the study constructs

Construct	Item	Outer loadings	VIF	Alpha	roh-A	Composite Reliability	AVE
LA	LA2	0.745	1.505	0.811	0.815	0.876	0.639
	LA3	0.819	1.831				
	LA4	0.795	1.689				
	LA5	0.835	1.803				
LR	LR2	0.657	2.182	0.936	0.937	0.944	0.546
	LR3	0.669	2.187				
	LR6	0.737	2.197				
	LR7	0.741	2.212				
	LR8	0.718	2.123				
	LR9	0.787	2.707				
	LR10	0.756	2.492				

	LR11	0.804	2.959				
	LR12	0.749	2.218				
	LR13	0.754	2.434				
	LR14	0.716	1.984				
	LR15	0.715	1.928				
	LR16	0.766	2.567				
	LR17	0.761	2.534				
OLC	OLC1	0.702	2.430	0.936	0.939	0.944	0.546
	OLC2	0.751	3.357				
	OLC3	0.767	3.917				
	OLC4	0.712	2.441				
	OLC5	0.759	2.380				
	OLC6	0.706	1.960				
	OLC7	0.761	2.434				
	OLC8	0.781	3.123				
	OLC9	0.759	2.680				
	OLC10	0.746	2.227				
	OLC11	0.733	2.443				
	OLC12	0.723	2.554				
	OLC13	0.697	2.070				
	OLC14	0.750	2.506				
SP	SP1	0.855	2.457	0.854	0.863	0.900	0.693
	SP2	0.856	3.250				
	SP3	0.865	3.317				
	SP4	0.750	1.325				

Note: OLC= Online Learning Climate, LR= Learning Readiness, LA= Learning Attitude, SP= Student Performance

4.2 Assessment of measurement and structural model (Mediation Analyses)

The model consists of 36 reflective indicators of four variables (Table 1). The results of model measurement consist of two parts: model reliability and validity. The present study considered the values of "Cronbach's alpha, roh-A, composite reliability, and average variance extract (AVE)" to approve the model's reliability (Alawamleh et al., 2020; Iglesias-Pradas et al., 2021), and all values are presented in table-1. The values of Cronbach's alpha are accepted if they are greater than 0.7 (Hair, Sarstedt, & Ringle, 2019). In the same way, the composite reliability value should also be greater than 0.7. The Cronbach's alpha values of models' constructs (learning readiness, learning attitude, online learning climate, and students' performance) are 0.811, 0.936, 0.936, 0.854 and the composite reliability values of models' constructs are 0.876, 0.944, 0.944, 0.900 respectively. All values of Cronbach's alpha and composite reliability are according to acceptable standards, which confirm the model's reliability in the present study. The value of roh-A reliability (0.815, 0.937, 0.939, 0.863) is also according to acceptable criteria (Hair, Sarstedt, et al., 2019). The average variance extract (AVE) values exceeding 0.5 are considered appropriate for the model's convergent validity (Alawamleh et al., 2020; Iglesias-Pradas et al., 2021). The table-1 illustrates that the AVE values (0.639, 0.546, 0.546, 0.693) are according to acceptable criteria.

All items' outer loading values of models' constructs are described in Table-1. According to experts' given criteria, the outer loading values greater than or equal to 0.7 are considered reliable for the model's validity (Alawamleh et al., 2020; Wei & Chou, 2020). Figure-2 depicts that the outer loading values of all items are according to the required criteria, except for items OLC15, LR1, LR4, LR5, LR18 and LA1. Hence, these items were deleted for better reliability outcomes. Some items below 0.7 are retained because these items did not affect the AVE value. The variance inflation factor (VIF) values are also depicted in

Table-1. The VIF values are measured to verify the collinearity issues in the model. The model is considered free from the collinearity problems if the VIF values are less than 0.5 (Hair, Sarstedt, et al., 2019). According to the outcomes presented in table-1, the VIF values are less than 0.5, such as the variable "online learning stress" item OLS-3 has the highest VIF value (3.917). Hence, it is confirmed that there are no collinearity issues in the model of the present study.

The R^2 values are considered to describe the model's strength, such as the values of latent variables greater than or near 0.5 indicates moderate strength of the model and the values near 0.25 shows weak model strength (Hair et al., 2017). The R^2 values of endogenous variables of the current study' model (learning readiness and students performance) are 0.310 and 0.380, respectively, which shows moderate model strength; however, one latent variable's value (learning attitude) is 0.187, which indicates weak model strength (Hair, Risher, et al., 2019). The model's Q2 (cross-validated redundancy) values are considered significant if they are larger than zero (Hair et al., 2017). The Q^2 values of all latent variables of the current study are greater than zero, demonstrating the model's significance.

The two well-known approaches, namely, Fornell–Larcker criterion and heterotrait–monotrait (HTMT) ratios, are used to approve the discriminant validity of the current study (Hair et al., 2011). The Fornell-Larcker criterion is evaluated by taking the square roots of AVE values of model constructs (Sarstedt, Hopkins, & Kuppelwieser, 2014). The Forenell-Larcker criterion values of variables are presented in Table-2. The values under the Fornell-Larcker criterion are accepted if each column's upper side first value is higher than their below values. Table-2 shows that all values of the Forenell-Larcker criterion are as per the accepted criteria. Thus, it is approved that discriminant validity based on the Fornell-Larcker criterion has been achieved in this study model. In addition, according to the given criteria, the HTMT values of all constructs should be less than 0.85; however, values greater than 0.90 are also tolerable (Hair, Sarstedt, et al., 2019). According to the outcomes of the present study, the HTMT values of constructs are showing in Table-3 as less than 0.85, which confirmed that discriminant validity in the present study's model has been established.

Table-2

Discriminant validity (Fornell-Larker-1981 Criteria)

Construct	LA	LR	OLC	SP
LA	***0.799***			
LR	0.699	***0.739***		
OLC	0.432	0.557	***0.739***	
SP	0.585	0.542	0.368	***0.833***

Note: OLC= Online Learning Climate, LR= Learning Readiness, LA= Learning Attitude, SP= Student Performance

Table-3

Discriminant validity (HTMT)

Construct	LA	LR	OLC	SP
LA	-	-	-	-
LR	0.799	-	-	-
OLC	0.486	0.580	-	-
SP	0.669	0.582	0.396	-

Note: OLC= Online Learning Climate, LR= Learning Readiness, LA= Learning Attitude, SP= Student Performance

4.3 Model estimation, direct and indirect

The empirical investigation of the current study was accompanied by using a bootstrapping approach through 5000 samples with replacements to evaluate the significance level. The direct, indirect, and total paths are presented in table-4. This study considered the "t" values and "p" values of statistics for the acceptance or rejection of the hypotheses. The current study hypothesis results are shown in table-4. According to assumption 1, the online learning climate positively affects student performance; however, the outcomes (t=1.491, p=0.136) depicted that the online learning climate does not positively influence student performance. Hence, the first proposition of this study is rejected. The outcomes (t= 8.213, p=0.000) of proposition 2 confirmed that the online learning climate has a positive association with learning readiness, which means the second proposition of the present study is accepted. In addition, the beta value of proposition 2 revealed that one unit change in the independent variable (online learning climate) would result in 0.557 changes in the dependent variable (learning readiness). According to the results (t= 4.756, p=0.000) of the third proposition, the online learning climate positively correlates with a learning attitude, which confirmed that the second proposition of the present study is accepted. In addition, the beta value of proposition 3 showed that one unit change in the independent variable (online learning climate) would result in 0.432 changes in the dependent variable (learning attitude).

The present study also considered the mediating role of learning readiness and learning attitude between online learning climate and student performance, respectively. For the empirical investigation of learning readiness and learning attitude as mediators, this study assumes proposition 4 and proposition 5. Results of H4 (t= 2.983, p=0.003) confirm that learning readiness positively mediates the relationship between online learning climate and student performance. Additionally, the path value (0.119) of H4 also confirms that learning readiness positively mediates the relationship between online learning climate and student performance. Based on outcomes, H4 of the present study is supported. According to the fifth assumption of the current study, learning attitude positively mediates the relationship between online learning climate and student performance. The results

(t= 3.411, p=0.001) confirm that learning attitude positively mediates the relationship between online learning climate and student performance. The beta value (0.134) of H5 confirmed that learning attitude positively mediates the relationship between online learning climate and student performance; therefore, proposition 5 of the present study is also accepted.

Table-4

Direct, Indirect and Total path estimates

Direct path	Beta	SD	t	p
LA -> SP	0.397	0.064	6.215	**0.000**
LR -> SP	0.225	0.063	3.584	**0.000**
OLC -> LA	0.432	0.091	4.756	**0.000**
OLC -> LR	0.557	0.068	8.213	**0.000**
OLC -> SP	0.071	0.047	1.491	**0.136**
Indirect Path	**Beta**	**SD**	**t**	**p**
OLC -> LA -> SP	0.172	0.050	3.411	**0.001**
OLC -> LR -> SP	0.125	0.042	2.983	**0.003**
Total Path	**Beta**	**SD**	**t**	**p**
LA -> SP	0.397	0.064	6.215	**0.000**
LR -> SP	0.225	0.063	3.584	**0.000**
OLC -> LA	0.432	0.091	4.756	**0.000**
OLC -> LR	0.557	0.068	8.213	**0.000**
OLC -> SP	0.368	0.081	4.512	**0.000**

Note: OLC= Online Learning Climate, LR= Learning Readiness, LA= Learning Attitude, SP= Student Performance

4.4 Assessment of measurement and structural model (Moderation Analysis)

Smart-PLS endorses a two-stage method for moderation analysis for a reflective measurement model, including model measurement and model estimation. The moderation analysis of the present study depicts that all essential criteria (construct reliability and validity) and indicators of model assessment such as out loading values (figure-3), CR, Cronbach's alpha, rho_A, and AVE are according to acceptable criteria (Hair et al., 2017). Table-5 describes the particulars of model assessment indicators.

The results of moderation analysis confirmed the discriminant validity with moderation effect (OLS) through two approaches (Fornell–Larcker criterion and HTMT ratios). Table-6 and table-7 explain the results of the Fornell–Larcker criterion and HTMT ratios. Table-6 and 7 show that discriminant validity is achieved. The results also demonstrate that the inner VIF values of all variables are significantly lower than 5 (Table-5), which approves that there is no collinearity issue in the present study's data. The R^2 values of endogenous variables of the current study's model (LR and SP) are 0.310 and 0.407), respectively, which shows moderate model strength; however, one latent variable's value (learning attitude) is 0.187, which indicates weak model strength (Hair, Risher, et al., 2019).

Table-5

Reliability and Convergent Validity of the study constructs

Construct	Item	Outer loadings	VIF	Alpha	roh-A	Composite Reliability	AVE
LA	LA2	0.744	1.505	0.811	0.816	0.876	0.639
	LA3	0.819	1.831				
	LA4	0.796	1.689				
	LA5	0.835	1.803				
LR	LR2	0.656	2.182	0.936	0.937	0.944	0.546
	LR3	0.668	2.187				
	LR6	0.737	2.197				
	LR7	0.741	2.212				
	LR8	0.717	2.123				
	LR9	0.788	2.707				
	LR10	0.756	2.492				
	LR11	0.804	2.959				
	LR12	0.749	2.218				
	LR13	0.754	2.434				
	LR14	0.716	1.984				
	LR15	0.715	1.928				
	LR16	0.766	2.567				
	LR17	0.761	2.534				
OLC	OLC1	0.702	2.430	0.936	0.939	0.944	0.546
	OLC2	0.751	3.357				
	OLC3	0.767	3.917				
	OLC4	0.712	2.441				
	OLC5	0.759	2.380				
	OLC6	0.706	1.960				
	OLC7	0.761	2.434				
	OLC8	0.781	3.123				
	OLC9	0.759	2.680				
	OLC10	0.746	2.227				

	OLC11	0.733	2.443				
	OLC12	0.723	2.554				
	OLC13	0.697	2.070				
	OLC14	0.750	2.506				
OLS	OLS1	0.923	3.756	0.926	0.936	0.947	0.818
	OLS2	0.872	2.761				
	OLS3	0.892	2.867				
	OLS4	0.930	4.072				
SP	SP1	0.861	2.457	0.854	0.855	0.901	0.697
	SP2	0.864	3.250				
	SP3	0.872	3.317				
	SP4	0.734	1.325				

Note: OLC= Online Learning Climate, LR= Learning Readiness, LA= Learning Attitude, SP= Student Performance, OLS= Online Learning Stress

Table-6

Discriminant validity (Fornell-Larker-1981 Criteria)

Construct	LA	OLS*LA	LR	OLC	OLS	OLS*RA	SP
LA	***0.799***						
OLS*LA	-0.586	***1.000***					
LR	0.699	-0.565	***0.739***				
OLC	0.432	-0.428	0.557	***0.739***			
OLS	0.096	0.066	0.037	-0.044	***0.905***		
OLS*RA	-0.577	0.831	-0.525	-0.464	0.078	***1.000***	
SP	0.578	-0.417	0.538	0.365	0.227	-0.434	***0.835***

Note: OLC= Online Learning Climate, LR= Learning Readiness, LA= Learning Attitude, SP= Student Performance, OLS= Online Learning Stress

Table-7

Discriminant validity (HTMT)

Construct	LA	OLS*LA	LR	OLC	OLS	OLS*RA	SP
LA	-	-	-	-	-	-	-
OLS*LA	0.650	-	-	-	-	-	-
LR	0.799	0.581	-	-	-	-	-
OLC	0.486	0.438	0.580	-	-	-	-
OLS	0.108	0.069	0.061	0.067	-	-	-
OLS*RA	0.641	0.831	0.539	0.474	*0.081*	-	-
SP	0.669	0.434	0.582	0.396	*0.256*	*0.455*	-

Note: OLC= Online Learning Climate, LR= Learning Readiness, LA= Learning Attitude, SP= Student Performance, OLS= Online Learning Stress

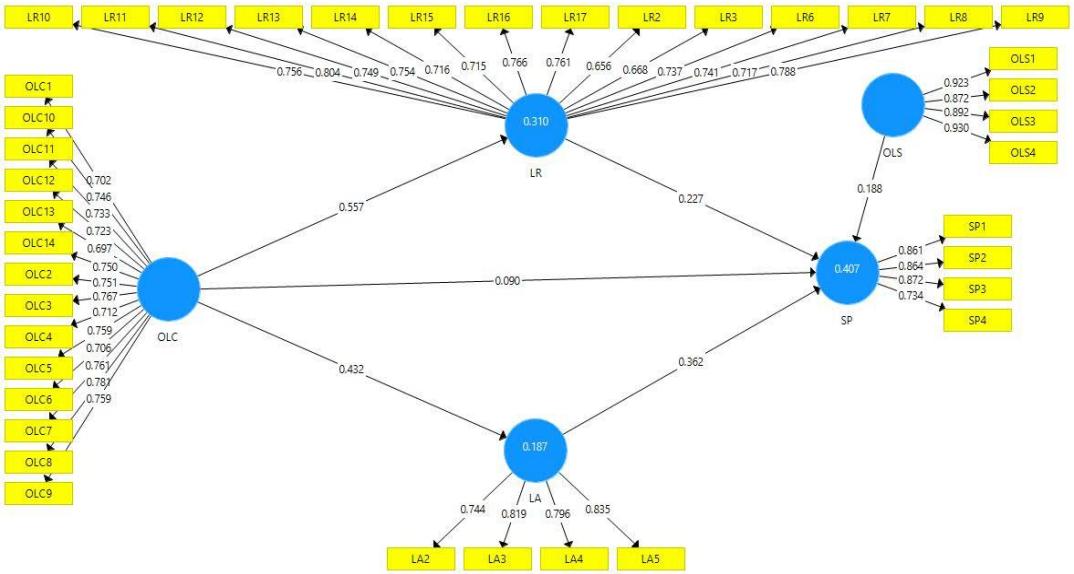

Figure-3 Path estimates

4.5 Model Estimation, Moderation

The present study also assessed the moderating role of online learning stress between learning readiness and student performance and between learning attitude and student performance. For empirical investigation present study assumes proposition six as online learning stress negatively moderates the relationship between learning readiness and student. The results (t= 1.970, p=0.049) confirmed that online learning stress negatively moderates the relationship between learning readiness and student; therefore, H6 of the present study is accepted (table-8). Additionally, according to the results of proposition 7 (t= 0.277, p=0.782), online learning stress does not moderate the relationship between learning attitude and student performance. Hence proposition 7 of the present study is rejected.

The online learning stress negatively moderates the slope of the relationship between learning readiness and students' performance. The slope is given in Figure-4. However, the online learning stress does not

moderate the slope of the relationship between learning attitude and students' performance. The slope is given in Figure-5.

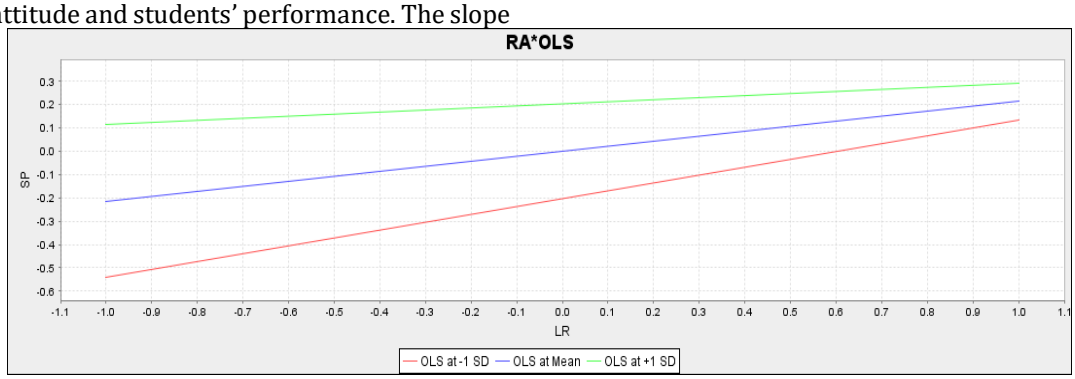

Figure-4. Moderating effect of online learning stress between learning readiness and student performance

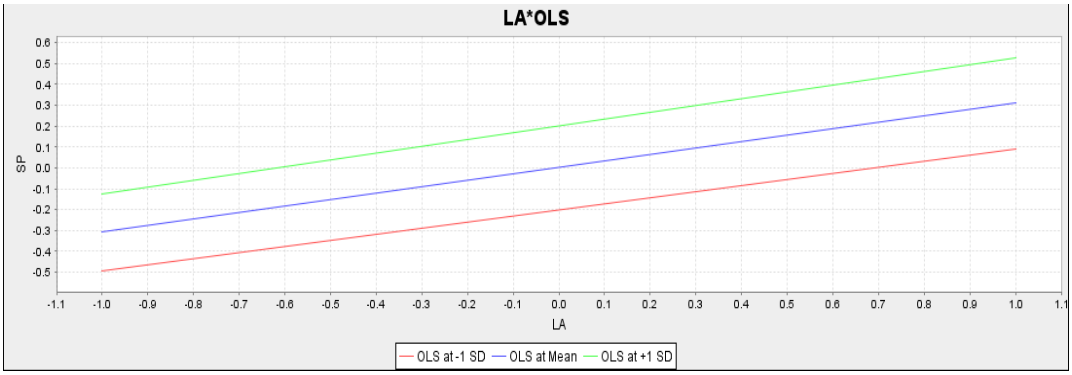

Figure-5. Moderating role of online learning stress between learning attitude and student performance

Table-8

Hypotheses testing

	Moderation Hypotheses	Coefficient (Beta)	S.D	*t*	*p*	Status
H6	OLS*LR -> SP	-0.124	0.063	1.970	0.049	Supported
H7	OLS*LA -> SP	0.017	0.061	0.277	0.782	Not Supported

Note: LR= Learning Readiness, LA= Learning Attitude, SP= Student Performance, OLS= Online Learning Stress

5 Discussion

The COVID-19 pandemic stumbles almost everyone's daily life routine (Saleem, Malik, & Qureshi, 2021). According to the turbulent pandemic situation, people have to switch their lifestyles and working patterns. People feel uncertain about their future during the pandemic due to unpredictable changes experienced during the epidemic. Organizations have to take quick action and reschedule their strategies and plans for smoothing their day-to-day work routine (Guzzo et al., 2021). Due to lockdowns and social distancing strategies, firms make alternative approaches and policies for working. Educational institutions also have to shift their academic activities from manual to online patterns (Cole et al., 2021). These shifting study patterns also need proper arrangements, tools, and tactics to deal with this dynamic situation. Online academic activities may also cause attitudinal and behavioral changes in students' learning patterns. With the support of self-determination theory, the present study assumes that an effective online learning climate motivates the employees to enhance their academic performance. This study hypothesizes that the online learning climate positively affects students' performance, learning readiness, and learning attitude for empirical investigation. In addition, the present study also assumes that learning readiness and learning attitude positively mediate the relationship between online learning climate and student performance, respectively. Moreover, this study also hypothesizes that online learning stress negatively moderates the relationship between learning readiness and student performance and the relationship between learning attitude and student performance.

The outcomes of the present study depicted that proposition 1 (online learning climate has a positive association with student performance) is not accepted, which means that the online learning climate does not have a positive association with student performance. A prior study reveals that there may be other reasons like teachers' ostracism behavior during online classes or mental absenteeism of students, which cause the reduction in students' performance (Hüsrevsahi, 2021). Moreover, findings confirmed that the online learning climate positively impacts students' learning readiness

and learning attitude, respectively, which means that hypotheses 2 and 3 of the present study are accepted. Further, hypotheses 4 and 5 prove that learning readiness and learning attitude positively mediate the relationship between online learning climate and student performance, respectively.

The present study also assessed the moderating role of online learning stress in the relationship between learning readiness and student performance and the relationship between learning attitude and student performance, respectively. The present study's findings reveal that hypothesis 6 is accepted, which means the online learning climate negatively moderates the relationship between learning readiness and student performance. However, according to the findings of hypothsis7, the online learning stress does not moderate the relationship between learning attitude and student performance. Online learning stress may not negatively moderate the relationship between learning attitude and student performance due to students' high emotional intelligence and self-efficacy (Lin et al., 2021).

The present study's findings are consistent with the studies of Cole et al. (2017); Molinari et al. (2005); Wei and Chou (2020). According to these scholars, an effective and proper learning climate boosts the students' performance. In addition, students' readiness and learning attitude are also positively influenced when institutions provide an appropriate learning climate to their students. When students feel that their institutions provide them with a proper learning climate, they feel motivated, and their working output increases constructively.

6 Theoretical and practical implications

This study is based on the self-determination theory (SDT) to increase the comprehension of the OLC and student performance relationship. Further, the mediators (learning readiness and learning attitude) are also explained by the SDT. The OLC may provide great feelings for students to learn anything in an eco-friendly environment; however, students may not focus on their readiness ability due to learning stress. The current study's findings support the self-determination theory in motivating and improving student performance. Furthermore, the environment should be more appealing in order to overcome unfavorable attitudes toward readiness and performance. The outcomes of this study show that students are inspired and motivated by the OLC. In the present study, OLC is very helpful for students. Students can discuss their project in video chat or join together once a week to minimize the isolated feeling. Moreover, with the help of this opportunity, learners identified their qualities and talents with the self-assessment test (Kaufmann & Vallade, 2020). Another advantage of such technologies is that students may communicate and work with one another, which will help them perform better (Cole et al., 2021). This study contributes to enhancing the OLC with interpersonal interactions.

Students prefer online learning because they feel stress outside during covid-19. To overcome the stress, institutions should develop a group project for students that can help to share ideas with each other.

As a result, the current study makes the following managerial recommendations. First, institutions should acknowledge students' perspectives on the online system every week. Instructors should treat all employees equally; otherwise, they may experience stress, which might affect their attitudes. In today's world, technology is employed to generate new ideas and techniques in order to beat competitors. A learner's stress may have an impact on OLC and performance. Second, educational institutions can set up online meetings with upper management to discuss web-based learning and how to improve readiness. Upper management has a greater ability to motivate them than instructors.

7 Limitations

Students have identified some constraints, such as instructor behavior, technical support, and delayed feedback and self-assessment reports. Future research should use a behavioral factor to investigate the association between OLC and emotional intelligence, and it should be done longitudinally with more variables. A comparative analysis must also be conducted to compare other sectors such as industries, small and medium-sized businesses, and banks. Researchers can vary the target population, age factor, and circumstances in future studies. Every university has a virtually identical culture, course of content, and online learning methods; future researchers should target schools and colleges to examine the effect of online learning. The smart PLS is used for analyzing the relationship between variables. This study used a structured questionnaire to collect the data. In future, data collection can be done through interviews and online surveys. In the future Author can be used SPSS or other software. The current study looked at the association between OLC and performance, learning readiness, and learning attitude as potential mediators. In the future, learning attitude can be used as a moderator, stress can be used as a mediator, and reverse investigation can also be used.

8 Conclusion

The COVID-19 pandemic upsets almost everyone's daily life routine. After experiencing the COVID-19 pandemic, educational institutions also shift their academic activities towards an online pattern. With the support of self-determination theory, the present study attempts to determine the role of the online

learning climate in students' performance. In addition, the current study also tries to find out the impact of the online learning climate on the learning readiness and learning attitude of students. Moreover, this study also attempts to determine the mediating role of learning readiness and attitude in the relationship between online learning climate and students' performance, respectively. To determine the moderating role of online learning stress in the relationship between learning reediness and student performance and between learning attitude and student performance is also an important objective of the current study. The present study's findings reveal that online learning climate did not directly influence students' performance; however, online learning climate has positive associations with learning readiness and learning attitude, respectively. Additionally, the present study's outcomes acknowledged that learning readiness and learning attitude positively mediate the relationship between online learning climate and students' performance. The present study's findings confirm that online learning stress negatively moderates the relationship between learning readiness and student performance but does not moderate the relationship between learning attitude and student performance.

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Ethical Approval Consent. The patients/participants provided their written informed consent to participate in this study. The study was conducted in accordance with the Declaration of Helsinki.

References

Abas, Z. W., Kaur, K., & Harun, H. (2004). *E-learning readiness in Malaysia*. Kuala Lumpur: Join Study of the Ministry of Energy, Water and Communications (MEWC), Malaysia and Open University Malaysia (OUM). https://www.academia.edu/download/6979697/f70.pdf

Alawamleh, M., Al-Twait, L. M., & Al-Saht, G. R. (2020). The effect of online learning on communication between instructors and students during Covid-19 pandemic. *Asian Education and Development Studies, 11*(2), 380-400. https://doi.org/10.1108/AEDS-06-2020-0131

Aldhafeeri, F. M., & Khan, B. H. (2016). Teachers' and students' views on e-learning readiness in Kuwait's secondary public schools. *Journal of Educational Technology Systems, 45*(2), 202-235. https://doi.org/10.1177/0047239516646747

Artino Jr, A. R. (2009). Online learning: Are subjective perceptions of instructional context related to academic success? *The Internet and Higher Education, 12*(3-4), 117-125. https://doi.org/10.1016/j.iheduc.2009.07.003

Borotis, S., & Poulymenakou, A. (2004). E-learning readiness components: Key issues to consider before adopting e-learning interventions. In *E-Learn: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education* (pp. 1622-1629). Association for the Advancement of Computing in Education (AACE). https://www.learntechlib.org/primary/p/11555/

Brecht, H. D., & Ogilby, S. M. (2008). Enabling a comprehensive teaching strategy: Video lectures. *Journal of Information Technology Education. Innovations in Practice, 7*, 71-86. http://jite.org/documents/Vol7/JITEV7IIP071-086Brecht371.pdf

Chernyaeva, T., Gritsina, V., Mikhajlov, E., & Ostapov, A. (2009). Correlation between elasticity and other properties of zirconium. *Probl At Sci Technol, 41*(17), 206-217. https://www.osti.gov/etdeweb/biblio/21300403

Cole, A., Anderson, C., Bunton, T., Cherney, M., Fisher, V. C., Featherston, M., Motel, L., Nicolini, K., Peck, B., & Allen, M. (2017). Student predisposition to instructor feedback and perceptions of teaching presence predict motivation toward online courses. *Online Learning Journal, 21*(4). https://www.learntechlib.org/p/183769/

Cole, A. W., Lennon, L., & Weber, N. L. (2021). Student perceptions of online active learning practices and online learning climate predict online course engagement. *Interactive Learning Environments, 29*(5), 866-880. https://doi.org/10.1080/10494820.2019.1619593

Demir Kaymak, Z., & Horzum, M. B. (2013). Relationship between online learning readiness and structure and interaction of online learning students. *Educational Sciences: Theory and Practice, 13*(3), 1792-1797. https://doi.org/10.12738/estp.2013.3.1580

Du, X., Zhang, M., Shelton, B. E., & Hung, J.-L. (2022). Learning anytime, anywhere: a spatio-temporal analysis for online learning. *Interactive Learning Environments, 30*(1), 34-48. https://doi.org/10.1080/10494820.2019.1633546

Engin, M. (2017). Analysis of Students' Online Learning Readiness Based on Their Emotional Intelligence Level. *Universal Journal of Educational Research, 5*(n12A), 32-40. https://www.learntechlib.org/p/190198/

Ferrer, J., Ringer, A., Saville, K., A Parris, M., & Kashi, K. (2020). Students' motivation and engagement in higher

education: The importance of attitude to online learning. *Higher Education, 83*, 1-22. https://doi.org/10.1007/s10734-020-00657-5

Gonzalez, T., De La Rubia, M. A., Hincz, K. P., Comas-Lopez, M., Subirats, L., Fort, S., & Sacha, G. M. (2020). Influence of COVID-19 confinement on students' performance in higher education. *PloS one, 15*(10), e0239490. https://doi.org/10.1371/journal.pone.0239490

Gunawardena, C. N., & Zittle, F. J. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *American journal of distance education, 11*(3), 8-26. https://doi.org/10.1080/08923649709526970

Guzzo, R. F., Wang, X., Madera, J. M., & Abbott, J. (2021). Organizational trust in times of COVID-19: Hospitality employees' affective responses to managers' communication. *International Journal of Hospitality Management, 93*, 102778. https://doi.org/10.1016/j.ijhm.2020.102778

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice, 19*(2), 139-152. https://doi.org/10.2753/MTP1069-6679190202

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2-24. https://doi.org/10.1108/EBR-11-2018-0203

Hair, J. F., Sarstedt, M., & Ringle, C. M. (2019). Rethinking some of the rethinking of partial least squares. *European Journal of Marketing, 53*(4), 566-584. https://doi.org/10.1108/EJM-10-2018-0665

Hair, J. F. J., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). A primer on partial least squares structural equation modeling (PLS-SEM). https://us.sagepub.com/en-us/nam/a-primer-on-partial-least-squares-structural-equation-modeling-pls-sem/book244583

Halili, S. H., & Zainuddin, Z. (2015). Flipping the classroom: What we know and what we don't. *The online Journal of Distance Education and E-learning, 3*(1), 15-22. https://www.tojdel.net/journals/tojdel/articles/v03i01/v03i01-04.pdf

Herguner, G., Son, S. B., Herguner Son, S., & Donmez, A. (2020). The Effect of Online Learning Attitudes of University Students on Their Online Learning Readiness. *Turkish Online Journal of Educational Technology-TOJET, 19*(4), 102-110. http://tojet.net/articles/v19i4/1949.pdf

Hergüner, G., Yaman, Ç., Çaglak Sari, S., Yaman, M. S., & Dönmez, A. (2021). The effect of online learning attitudes of sports sciences students on their learning readiness to learn online in the era of the new coronavirus pandemic (COVID-19). *Turkish Online Journal of Educational Technology-TOJET, 20*(1), 68-77. http://www.tojet.net/articles/v20i1/2019.pdf

Hung, M.-L., Chou, C., Chen, C.-H., & Own, Z.-Y. (2010). Learner readiness for online learning: Scale development and student perceptions. *Computers & Education, 55*(3), 1080-1090. https://doi.org/10.1016/j.compedu.2010.05.004

Hüsrevsahi, S. P. (2021). The Reasons for and Results of Ostracism at Schools and Recommendations for Solutions through Teacher Experiences. *International Journal of Progressive Education, 17*(3), 202-215. https://doi.org/10.29329/ijpe.2021.346.13

Hwang, G.-J., Wang, S.-Y., & Lai, C.-L. (2021). Effects of a social regulation-based online learning framework on students' learning achievements and behaviors in mathematics. *Computers & Education, 160*, 104031. https://doi.org/10.1016/j.compedu.2020.104031

Iglesias-Pradas, S., Hernández-García, Á., Chaparro-Peláez, J., & Prieto, J. L. (2021). Emergency remote teaching and students' academic performance in higher education during the COVID-19 pandemic: A case study. *Computers in human behavior, 119*, 106713. https://doi.org/10.1016/j.chb.2021.106713

Jambulingam, T., & Saxton, T. (2021). Strategic Alliance and Acquisition Performance: Impact of Interfirm Synergies and Motives in the Bio-Pharmaceutical Industry. *Journal of Commercial Biotechnology, 26*(4), 37–49. https://doi.org/10.5912/jcb1007

Kaufmann, R., Sellnow, D. D., & Frisby, B. N. (2016). The development and validation of the online learning climate scale (OLCS). *Communication Education, 65*(3), 307-321. https://doi.org/10.1080/03634523.2015.1101778

Kaufmann, R., & Vallade, J. I. (2020). Exploring connections in the online learning environment: student perceptions of rapport, climate, and loneliness. *Interactive Learning Environments*, 1-15. https://doi.org/10.1080/10494820.2020.1749670

Knowles, E., & Kerkman, D. (2007). An investigation of students attitude and motivation toward online learning. *InSight: A Collection of Faculty Scholarship, 2*, 70-80. http://stu.westga.edu/~djeffer3/8463_MEDT/8484-30ARTICLES/2.pdf

Kotler, P., & Clarke, R. N. (1987). *Marketing For Health-Care OrganizationsPrentice-Hall*. Engelwood Cliffs, NJ.

Kruger-Ross, M. J., & Waters, R. D. (2013). Predicting online learning success: Applying the situational theory of publics to the virtual classroom. *Computers & Education, 61*, 176-184. https://doi.org/10.1016/j.compedu.2012.09.015

Lee, A. Y. (2010). Media education: Definitions, approaches and development around the globe. *New horizons in*

education, 58(3), 1-13. https://www.academia.edu/download/55422886/1.pdf
Lee, H. Y., Qu, H., & Kim, Y. S. (2007). A study of the impact of personal innovativeness on online travel shopping behavior—A case study of Korean travelers. *Tourism Management, 28*(3), 886-897. https://doi.org/10.1016/j.tourman.2006.04.013
Liaw, S.-S., Chen, G.-D., & Huang, H.-M. (2008). Users' attitudes toward Web-based collaborative learning systems for knowledge management. *Computers & Education, 50*(3), 950-961. https://doi.org/10.1016/j.compedu.2006.09.007
Lin, H.-C., Li, M., Stevens, C., Pinder-Amaker, S., Chen, J. A., & Liu, C. H. (2021). Self-harm and suicidality in US college students: associations with emotional exhaustion versus multiple psychiatric symptoms. *Journal of affective disorders, 280*, 345-353. https://doi.org/10.1016/j.jad.2020.11.014
Lopez, C. (2007). "Evaluating E-Learning Readiness In A Health Sciences Higher Education. In *IADIS International Conference ELearning*. http://carlalopes.com/pubs/lopes_IADIS_2007.pdf
Mohd Daud, N., Idris, A. S., Abd Manaf, N. A., & Mudzaffar, F. A. (2013). Relationship Between Sports Involvement and Students' Performance in Malaysian University. *International Journal of Undergraduates Studies, 2*(3), 32-39. https://www.academia.edu/6307716
Molinari, D. L., Dupler, A. E., & Lungstrom, N. (2005). The stress of online learning. In *Encyclopedia of Distance Learning* (pp. 1674-1679). IGI Global. https://doi.org/10.4018/978-1-59140-555-9.ch254
Moustakas, L., & Robrade, D. (2022). The Challenges and Realities of E-Learning during COVID-19: The Case of University Sport and Physical Education. *Challenges, 13*(1), 9. https://doi.org/10.3390/challe13010009
Orcutt, J. M., & Dringus, L. P. (2017). Beyond being there: Practices that establish presence, engage students and influence intellectual curiosity in a structured online learning environment. *Online Learning, 21*(3), 15-35. https://nursesnotesforlearning.trubox.ca/wp-content/uploads/sites/591/2019/04/Beyond-Being-There.pdf
Panigrahi, R., Srivastava, P. R., & Sharma, D. (2018). Online learning: Adoption, continuance, and learning outcome—A review of literature. *International Journal of Information Management, 43*, 1-14. https://doi.org/10.1016/j.ijinfomgt.2018.05.005
Pierce, R., Stacey, K., & Barkatsas, A. (2007). A scale for monitoring students' attitudes to learning mathematics with technology. *Computers & Education, 48*(2), 285-300. https://doi.org/10.1016/j.compedu.2005.01.006
Ramadhanu, A., Putra, R. B., Syahputra, H., Arsyah, R. H., & Sari, D. P. (2019). Learning satisfaction analysis of online learning readiness with learning culture and character strength as antecedent variables. *Journal of Physics: Conference Series, 1339*(1), 012080. https://doi.org/10.1088/1742-6596/1339/1/012080
Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. The Guilford Press. https://doi.org/10.1521/978.14625/28806
Saleem, F., Malik, M. I., & Qureshi, S. S. (2021). Work stress hampering employee performance during COVID-19: is safety culture needed? *Frontiers in Psychology, 12*, 655839. https://doi.org/10.3389/fpsyg.2021.655839
Sammut, S. M. (2021). The Role of the Biotechnology Industry in Addressing Health Inequities in Africa: Strengthening the Entire Health Care Value Chain. *Journal of Commercial Biotechnology, 26*(4), 50-69. https://doi.org/10.5912/jcb1008
Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review, 26*(2), 106-121. https://doi.org/10.1108/EBR-10-2013-0128
Shah, S. S., Shah, A. A., Memon, F., Kemal, A. A., & Soomro, A. (2021). Online learning during the COVID-19 pandemic: Applying the self-determination theory in the 'new normal'. *Revista de Psicodidáctica (English Ed.), 26*(2), 168-177. https://doi.org/10.1016/j.psicoe.2020.12.003
Shankar, N. L., & Park, C. L. (2016). Effects of stress on students' physical and mental health and academic success. *International Journal of School & Educational Psychology, 4*(1), 5-9. https://doi.org/10.1080/21683603.2016.1130532
Siddiqui, M. I., Shah, R., & Ariser, K. N. (2021). Challenges of Online Learning and Attitude of Medical Student at LUMHS: Comparative Study among Rural and Urban Students during Covid-19 Pandemic. *Med. Forum, 32*(5), 82-86. https://pesquisa.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/resource/pt/covidwho-1323707
Smith, P. J., Murphy, K. L., & Mahoney, S. E. (2003). Towards identifying factors underlying readiness for online learning: An exploratory study. *Distance Education, 24*(1), 57-67. https://doi.org/10.1080/01587910303043
Swan, K., & Shih, L. F. (2005). On the nature and development of social presence in online course discussions. *Journal of Asynchronous learning networks, 9*(3), 115-136. https://www.academia.edu/download/1899948/JALN_socpres2_v9n3_swan.pdf
Wahyu, A., & Simanullang, R. H. (2020). Student Stress Due to Online Learning During the Covid-19 Pandemic. *J Aisyah J Ilmu Kesehat, 5*(2), 153-157. http://dx.doi.org/10.30604/jika.v5i2.346

Warner, D., Authority, A. N. T., & Choy, S. (1998). *Readiness of VET clients for flexible delivery including on-line learning*. Brisbane, Queensland: ANTA. http://hdl.voced.edu.au/10707/33256

Warttig, S. L., Forshaw, M. J., South, J., & White, A. K. (2013). New, normative, English-sample data for the short form perceived stress scale (PSS-4). *Journal of health psychology, 18*(12), 1617-1628. https://doi.org/10.1177/1359105313508346

Wei, H.-C., & Chou, C. (2020). Online learning performance and satisfaction: do perceptions and readiness matter? *Distance Education, 41*(1), 48-69. https://doi.org/10.1080/01587919.2020.1724768

Yousef, D. A. (2000). Organizational commitment: a mediator of the relationships of leadership behavior with job satisfaction and performance in a non-western country. *Journal of Managerial Psychology, 15*(1), 6-24. https://doi.org/10.1108/02683940010305270

Zhai, X., Gu, J., Liu, H., Liang, J.-C., & Tsai, C.-C. (2017). An experiential learning perspective on students' satisfaction model in a flipped classroom context. *Journal of Educational Technology & Society, 20*(1), 198-210. https://scholar.lib.ntnu.edu.tw/en/publications/an-experiential-learning-perspective-on-students-satisfaction-mod-2