Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Children and Youth Services Review 118 (2020) 105355

Contents lists available at ScienceDirect

Children and Youth Services Review

journal homepage: www.elsevier.com/locate/childyouth

Impact of "e-Learning crack-up" perception on psychological distress among college students during COVID-19 pandemic: A mediating role of "fear of academic year loss"

Najmul Hasan, Yukun Bao*

Center for Modern Information Management, School of Management, Huazhong University of Science and Technology, Wuhan 430074, PR China

ARTICLE INFO

Keywords:
e-Learning crack-up
Fear of academic year loss
Psychological distress
COVID-19

ABSTRACT

While literature reveals the positive perception of e-Learning, this study examined and assessed the impact of e-Learning crack-up perceptions on psychological distress among college students during COVID-19 pandemic. Kessler psychological distress scale (*K*10) was used to evaluate stress symptoms. This study first conducted an online focus group discussion (OFGD) with the target population to develop the scale of "e-Learning crack-up" and "fear of academic year loss". Afterward, a questionnaire was developed based on OFGD findings. An online survey was conducted amongst college students in Bangladesh using a purposive sampling technique. Results show that "e-Learning crack-up" perception has a significant positive impact on student's psychological distress, and fear of academic year loss is the crucial factor that is responsible for psychological distress during COVID-19 lockdown. This study can provide an understanding of how "e-Learning crack-up" and "Fear of academic year loss" influence college students' mental health. Theoretically, this study extends and validated the scope of Kessler's psychological distress scale with two new contexts. Practically, this study will help the government and policymakers identify the student's mental well-being and take more appropriate action to address these issues.

1. Introduction

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), popularly known as COVID-19, was first identified in late December 2019 from Wuhan, China (Temsah et al., 2020), which spread then more than 200 countries (Shen et al., 2020). The World Health Organization (WHO) immediately announced the situation as a global pandemic on March 11, 2020 (Kapasia et al., 2020). As of 5 July 2020, a total number of 11,125,245 global confirmed cases with 203,836 new cases and a total of 528,204 deaths were reported (WHO, 2020). Since COVID-19 was declared as a global pandemic, public health, including mental health, has become a threat. Millions of people, including researchers, academic, corporate personal as well as students, were forced by the national governments to stay safe isolating themselves or implementing a whole and/or partial lockdown globally (Cooper, Mondal, & Antonopoulos, 2020). Due to imposing lockdown for a long time, the physical access to the classroom has been restricted. About 1.5 billion school going, and university students have been suffering because of institutional closure due to COVID-19 outbreak (IAU, 2020). The closings of educational institutes affect children and youngs primarily (Araújo, de Lima, Cidade, Nobre, & Neto, 2020). Online-classes are to be found demandable as an alternative to institutional closure during this unprecedented time. Nevertheless, as a result of an inadequate learning approach, both students and instructors face numerous challenges and difficulties including psychological problems. (Alam, 2020; Bao, 2020). The successful implementation of e-Learning systems depends on how the program is performed by students and instructors (Thongsri, Shen, & Bao, 2019b). Though online teaching is one of the promising alternatives to the physical classroom, students show a negative perception of online learning behavior (Rohman, Marji, Sugandi, & Nurhadi, 2020), which might be a significant consequence that is responsible for psychological distress. The previous study showed that students are anxious because of lack of enjoyment at classroom (Dewaele, Magdalena, & Saito, 2019). There are various causes of e-Learning crack-up such as course quality, the usability of content, technological ease, availability of technical assistance, and the likelihood of interaction with peer students (Penna & Stara, 2007; Ssekakubo, Suleman, & Marsden, 2011). Most of the crack-up in e-Learning are technologically based, and software and hardware support are not available (Al-araibi, Mahrin, & Yusoff, 2019).

Notwithstanding, some developing countries do not fully endorse e-Learning systems (Thongsri, Shen, & Bao, 2019a). The lack of readiness

* Corresponding author.
E-mail addresses: nhasandsr@gmail.com (N. Hasan), yukunbao@hust.edu.cn (Y. Bao).

https://doi.org/10.1016/j.childyouth.2020.105355
Received 9 July 2020; Received in revised form 9 August 2020; Accepted 9 August 2020
Available online 12 August 2020
0190-7409/ © 2020 Elsevier Ltd. All rights reserved.

knowledge in the implementation of e-Learning is another source of e-Learning crack-up. An internet-based *meta*-analysis concluded that current work reassures e-Learning is better than nothing and is (on average) close to conventional training (Cook, 2009). Also, a survey by Cao et al. (2020), which includes 7143 participants of college students, found around 25% of students are suffering from severe anxiety due to e-Learning crack-up. Another study (Lee, 2020) reported that approximately 83% of students experience the worst situation, and 26% of students are unable to get access to mental health support. This condition offers a situational demand to measure psychological distress among college students due to the negative perception of the e-Learning system. To date, however, there has been no comprehensive research performed into psychological distress due to the negative perception of e-Learning among college students during this pandemic. Thus the main objective of this study is to assess the impact of "e-Learning crack-up" perception on psychological distress among college students during the COVID-19 pandemic.

Recent literature (Jæger & Blaabæk, 2020) reveals that students have unequal learning opportunities as result of discrimination against better family facilities. Beaunoyer, Dupéré, and Guitton (2020) investigated digital disparities during COVID-19 periods. While most of the educational institutes adopting their online classes (Yen, 2020; Zhou, Wu, Zhou, & Li, 2020), the question arises – *how this approach benefits students with lower-income families and remote areas?* According to a report published by Pew Research Center, a rising number of students are from lower-income families (Richard & Anthony, 2019). Studies show the significant strong relationship between poverty and psychological stress (Jiang, 2020). They mostly suffer from information technology resources (Wong, Ho, Chen, Gu, & Zeng, 2015). Due to digital inequalities and lack of access to modern technology, students from lower-income families have limited or no access to online classes. At the same time, excessive internet cost is another obstacle to access online-classes (Adam, Kaye, & Haßler, 2020). Baticulon, Alberto, Baron, Mabulay, Rizada, Sy, and Reyes (2020) identified the obstacles to e-Learning in five types: technological, personal, families, institutional and communities, and only 41 per cent of students thought they could physically and mentally participate in online study. However, the above reasons make students' fear of academic year loss. Sintema (2020) reported that the students in this year will probably drop in the pass percentage due to COVID-19 lockdowns. A survey from Bangladesh, a developing country, shows that some 17.2 million primary students and millions of students are awaiting for their unpredictable higher education exams (Hasan, 2020). Another report illustrated student's fear of losing academic year in New Delhi, India (NDTV, 2020). Thus, fear of academic year loss is the most concern which enhances student's psychological anxiety. This study attempts to measure the "Fear of academic year loss" as a mediating role for assessing psychological distress among college students during covid-19 pandemic in a developing country, Bangladesh.

2. Method and materials

2.1. Conceptual framework and hypothesis development

Based on the literature and online FGD with the target group of students, the conceptual research model, and respective hypotheses have been constructed by illustrating the relationships between and/or among the exogenous and indigenous variables (Fig. 1). This conceptual model consists of a single exogenous variable named "e-Learning Crack-up" perception and endogenous variables named "Psychological Distress" with a mediating variable called "Fear of academic year loss". The following sub-sections hereafter describe the model and hypotheses.

2.1.1. e-Learning crack-up perception

Poor motivation by the instructors and higher expectations of students make effective e-Learning systems crack-up. Students are not equivalent to a single classroom from different perspectives. Surprisingly, students with new technology or novice students suffer from multiple stressors (Crooks, Smith, Robinson-Link, Orenstein, & Hoover, 2020). Many students acquire knowledge prominently; some do not. This knowledge acquiring procedure depends on how they are treated by resource availability or access to learning tools. Due to social and economic dividends, many students suffer from access to new technology resources. At the same time, a lack of IT knowledge was identified as a significant impediment to non-technical instructors. Moreover, the nature of e-Learning (limited time, interpretation, and assessment methods) compared to traditional classroom methods, makes student dissatisfied. In this technological world, around 25% of teens from lower-income families do not have a home computer (Auxier & Anderson, 2020) and internet access (Huffman, 2018). Quality concerns, lack of motivation to use e-Learning, inadequate English expertise, lack of technical support from institutes and instructors, inadequate access to technology, and overall lack of e-Learning content development experience are seen as the major obstacles to efficient e-Learning systems. Because of these challenges, students are mentally frustrated to complete their courses successfully. Thus the following hypothesis has been constructed:

H1: There is a significant strong relationship between "e-Learning crack-up" perception and student's psychological distress

In addition, most students worry about academic loss because the government has not already enforced an active policy on college students. The government has failed to take time-oriented decisions for millions of students who have recently finished their secondary school. Most e-Learning programs have failed because regulatory and governmental agencies did not plan and manage it in an effective manner (Teo, Kim, & Jiang, 2020). Regular classes are now unpredictable, and they already fall in loss criteria for the academic year. The same applies to final year college students because they could not attend public exams, and yet it is unclear if they can become an undergraduate student. Visibly, these two prominent groups of students could lose their academic year because of e-Learning crack-up. Thus the following hypothesis has been constructed:

H2: e-Learning crack-up has a considerable impact on the student's fear of academic loss in the context of psychological distress.

2.1.2. Fear of academic year loss

Yet no decision has been taken by the government and policymaker for the final year college students who would like to see themselves as prospective undergraduate students. To avoid academic year loss, government is taking lots of initiatives. These include syllabus cuts and online courses provided by the state-owned satellite television channel. From an expert's point of view, all of which are intended for primary and secondary school students. In addition, a recent survey conducted by the Bangladesh Bureau of Statistics (BBS, 2019) indicates that 50% of households of the country do not have access to satellite television. The mid-term student evaluation has already been canceled. Millions of college students are currently waiting for attending the public examination, but the government has no clear direction. Thus students are facing problems with two-folds: they are concerned about their regular preparations diminution and fear of academic year loss. Studies have investigated the relationship between fear of failure and anxiety (Choi, 2020). At the same time, outcomes from the OFGD indicate that some students reported about their sleeping disorder, mental stress due to fear of uncertain future admission. Thus we constructed the following hypothesis:

H3: There is a significant impact of student's "Fear of academic year loss" on student's psychological distress

2.2. Pilot study and instrument development

The main objective of this study is to evaluate the impact of the "e-

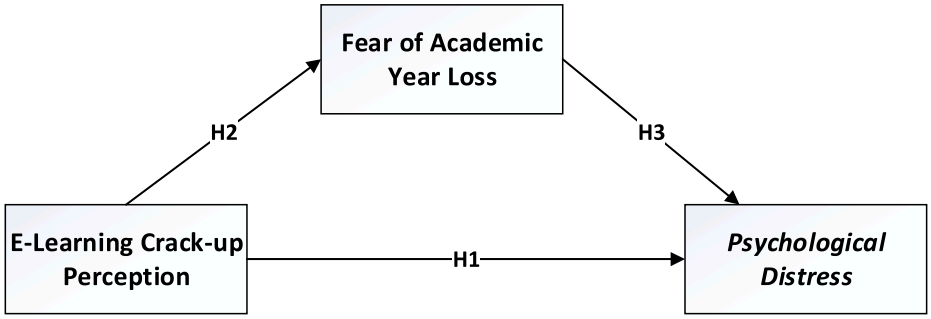

Fig. 1. Conceptual research model.

Learning Crack-up" perception on psychological distress among college students in Bangladesh considering "Fear of academic year loss" as a mediating role. To achieve this, we first defined and modified the Kessler psychological distress scale (*K*10) (Andrews & Slade, 2001) as the outcome variables, which was validated for assessment of psychological distress in the context of Bangladesh (Uddin, Islam, & Al Mahmud, 2018). Since there are a limited number of previous studies on this present research question, this study used a mixed-method approach to explore the key features. The mixed-method, qualitative approach in the pilot study phase and quantitative approach in the evaluation phase, are more effective while literature is minimal (Eom, Han, & Song, 2020; Islam et al., 2015; Miah, Hasan, Hasan, & Gammack, 2017). To understand the perception of the present "e-Learning crack-up" and "Fear of academic year loss," we first arranged an online video discussion session (online focus group discussion (OFGD)) among the information technology (IT) facilitated college students mainly from urban areas. Two students from rural areas had connected in the discussion sessions to understand regional dividends by providing the necessary IT resources by the researchers. A total of ten students (except moderators) have participated in the OFGD. Participants were selected from various colleges and several classes. The age range was between 15 and 18 years old, and boys and girls have participated spontaneously. Participation in the discussion session was fully volunteered works based on prior invitation over the mobile phone call. The OFGD session was around one hour and twenty-minute long. Several scatter responses came from the discussion. We noticed significant discrimination among the urban and rural area's access to e-Learning. After scrutinizing the scattered response, the most frequent answers were selected to form a structured questionnaire for quantitative data collection. Details of the questions chosen for the quantitative study are presented in Appendix A. The methodological strength of this study was, therefore, the mixed-method approach, as we tried throughout to find perceptions from multiple viewpoints to strengthen and expand the importance of "e-Learning crack-up" and a "Fear of academic year loss". In this respect, qualitative information of OFGD has been integrated to develop a better understanding of the newly introduced constructs.

2.3. Study population and sample selection

All students of the higher secondary school were equally treated for the inclusion of this study in Bangladesh. To meet the primary objective, only higher secondary students were considered for data collection. Thus a purposive sampling technique has applied. An anonymous online survey instrument was developed to keep personal information confidential and circulated through online communication, i.e., Facebook messenger, Facebook public group of the target population, personal e-mail, etc. Besides, the questionnaire was initially developed in the English language. It was translated into local (Bengali) language by a professional translator. This approach was applied for easy to understand to the target population. The questionnaire was divided into two parts: Section A includes several demographic information including their drug consumption behavior and history of personal anxiety, and section B includes different construct's items for evaluation of the proposed model. Participations were surveyed within the periods June 06 to June 30, 2020. There were two phases of data collection. First, we sent 700 invitations and got back 372 responses within two-consecutive weeks. In the second phase, after a soft reminding (prompting), we received more 63 replies. A total of 435 number of responses have received with a 62% response rate.

However, after scrutinizing the initial data, we excluded 35 responses due to having outliers, and finally, 400 data were recorded for the final analysis. There is no strict rule to explain the adequacy of the number of samples for model evaluation (Muthén & Muthén, 2002) as the sample size of the study does not depend on a single factor. A practical suggestion is to have at least multiple cases per free variables. Most of the sample size estimations have been based on three methods: Monte Carlo simulations (Robert & Casella, 2013), the 10-times rule method (Hair, Hult, Ringle, & Sarstedt, 2016), and minimum R-squared (Leguina, 2015). Among them, the 10-times rule technique is widely used. While Bentler (1989) suggested a 5:1 ratio of a sample size to the number of free variables, most of the researchers have examined with subject to item ratios of 10:1 or less, which is a rule-of-thumb for the determination of a sample size. As we have twenty-three variables, to the model assessment and rationale for the research problem, our sample size is sufficient for model evaluation. The above procedure has ethically approved by the Center for Modern Information Management, Huazhong University of Science and Technology, Wuhan, China.

2.4. Analytical approach

Structural equation modeling (SEM) is a flexible and powerful multivariate analytical approach that helps identify underlying constructs and their relationships from observational data. Since SEM is closely affiliated with multiple regression, Hair Jr, Matthews, Matthews, and Sarstedt (2017) provide evidence that SEM is a powerful tool for operationalization. This tool is also appropriate to test and examine the proposed conceptual framework even if the sample size is relatively small (i.e., 100 observations). SmartPLS-3.7 package software has employed to operationalize the SEM. Both measurement and structural models were calculated along with few descriptive statistics. For the final decision, T-Statistics and P- values were considered to take supportive decisions with a 95% significant level.

3. Results

3.1. Demographic statistics

The study consists of 400 college students aged between 15 and 18 years old. Table 1 shows that more than half (56.4%) were boys, and remaining (43.6%) were girls who participated in this study. Regarding the objective and due to purposive sampling, 100% of students reported having a higher secondary (HSC) level. More than three quarter (83.1%) lives in urban areas. Surprisingly, the main objective of using the internet is for social media (100%), followed by gamming (87.1%).

Table 1
Demographic Information.

Socio-demographic	Response	Frequency	Percentage
Gander	Boy	226	56.4%
	Girl	174	43.6%
Age (in Year)	15–18	400	100.0%
Education	HSC	400	100.0%
Area	Urban	332	83.1%
	Rural	68	16.9%
purpose of Internet Use	Social Media use	400	100.0%
	Entertainment	213	53.2%
	Educational	167	41.7%
	Communication with friends	227	56.80%
	Gaming	348	87.10%
Monthly Household Income	< 25,000 BDT	69	17.3%
	25001–40000 BDT	178	44.5%
	40001–50000 BDT	97	24.30%
	> 50,000 BDT	56	13.90%
Internet usage behavior	Once in Daily	94	23.40%
	Once in a Week	185	46.20%
	Once in twice-week	92	23.00%
	Once in a month	30	7.40%
Smoking Status	Yes	11	2.80%
	No	389	97.20%
Previous Medical History of Distress	Yes	14	3.50%
	No	386	96.50%

Less than half (41.7%) of the students use the internet for educational purposes. However, most (44.5%) of students have a monthly household income between 25001 and 40000 BDT. As illustrated in Table 1, approximately 46.2% of students use the internet at least once a week, followed by once in daily (23.4%). Finally, very few (2.8%) students had a smoking habit, whereas 3.5% of students were found the previous medical history of psychological distress.

3.2. Normality test

A skewness- Kurtosis method has been used to check the univariate normality of every variable (Alalwan, Dwivedi, & Rana, 2017; Byrne, 2013). The results were found in their promising scales respectively. As represented in Appendix A, all skewness values between −2 to + 2 and kurtosis values between-7 and + 7, which supported the normality of the univariate distribution. (Abdollahi, Talib, Yaacob, & Ismail, 2015; Byrne, 2013).

3.3. Control of common method variance

A survey-oriented data collection method evaluated the research hypothesis in this study. When data from different sources are obtained, and there is a strong correlation between indicators, it can be expected that there will be a common method variance. To ensure there is no common method variance (CMV) in the collected data, "Collinearity Statistics" have resulted in variance inflation factors (VIFs). If the VIF results are greater than 5, the model can be contaminated by CMV (Kim, 2019; Wong, 2013). The full results of collinearity research are found in this study to be equal to or lower than 5 (Appendix A). which indicates that common method variance is not an issue in this study.

3.4. Measurement model

The measurement model was tested by means of the Confirmatory Factor Analysis for the goodness of fit indices. This study considered factor loading, Cronbach's Alpha, composite reliability (CR), average variance extracted (AVE), and discriminant validity for both Fornell-Larcker and Heterotrait-Monotrait Ratio (HTMT) Criterion (Hair, Howard, & Nitzl, 2020). Model validation has performed based on two parameters (Standardized Root Mean Square Residual (SRMR) and Normed Fit Index (NFI)), as suggested by (Henseler, Ringle, & Sarstedt, 2015). To avoid model misspecification the value of SRMR, indicating SRMR < 0.08 or < 0.10, (Hu & Bentler, 1998) and NFI should be greater than 0.95. However, our model fits the data very well with SRMR = 0.092 and NFI = 0.954. The internal reliability of the constructs has been calculated using Cronbach's alpha, where values should be above 0.50 (Hu & Bentler, 1998). Besides, composite reliability values above 0.70 are approved for measuring the construct reliability (Fornell & Larcker, 1981). Finally, the average variance extracted (AVE) has been calculated. The AVE cut-off point must exceed 0.50 (Fornell & Larcker, 1981), which means a smaller measuring error than the structure observed variance. Table 2 represents the Cronbach's Alpha, rho_A, Composite Reliability, AVE. Factor loadings are described in "Appendix A" are to be found satisfactory. Also, to confirming the discriminant validity, the square root of AVE must be higher than the inner-correlation of the construct (Fornell & Larcker, 1981). Table 3 represents the satisfying criteria of the discriminant validity of this study. In the end, to ensure double-blind discriminant validity, we computed a new approach called Heterotrait-Monotrait ratio (HTMT) criteria for each pair of constructs (Hasan, Miah, Bao, & Hoque, 2019; Henseler et al., 2015). Beside, considering $HTMT_{0.90}$ or $HTMT_{inference,}$ the factors confirmed discriminant validity (Table 3).

3.5. Structural model

While the measurement model showed significant results, we proceeded to check the structural model. Table 4 represents the direct, indirect, and total effects of e-Learning crack-up and fear of academic year loss on student's psychological distress. Path coefficient (β), T-Statistics, and P-values are presented to decide whether the proposed hypotheses have been accepted or rejected. From Table 4, it is clear that there is a significant impact of e-Learning crack-up on psychological distress (β = 0.956; T = 283.457), which supports the H1. Similarly, e-Learning crack-up also has a significant impact on fear of academic year loss (β = 0.659; T = 16.864) supporting H2. Moreover, psychological distress is influenced by fear of academic year loss (β = 0.061; T = 14.926). Thus, all of our hypotheses have been supported.

Nevertheless, it is crucial to keep in mind that the strength and direction of the specific path coefficients cannot be transcribed and analyzed, even without probability values. Moreover, based on contrast, the model indicates 43% of variance lies in fear of academic year loss and 99% of the variability in psychological distress, which suggests a large proportion of variance is accounted for mental stress. Finally, the prediction relevance of the model was tested using Q-square (Q^2). The Q^2 values greater than zero indicate excellent prediction relevance (Rehman Khan & Yu, 2020). Table 5 illustrates that our model achieved $Q^2 = 0.249$ and $Q^2 = 0.656$ for "fear of academic year loss" and "psychological distress" respectively, which suggested a good fit. Details of the findings are to be found in Table 4, Table 5 and Fig. 2.

Table 2
Convergent validity analysis.

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
e-Learning Crack-up	0.949	0.950	0.958	0.994
Fear of Academic Year Loss	0.874	0.900	0.907	0.740
Psychological Distress	0.951	0.952	0.958	0.719

Table 3
Discriminant validity analysis.

	Fornell-Larcker Criterion			Heterotrait-Monotrait Ratio (HTMT)		
	e-Learning Crack-up	Fear of Academic Year Loss	Psychological Distress	e-Learning Crack-up	Fear of Academic Year Loss	Psychological Distress
e-Learning Crack-up	**0.997**	–	–	–	–	–
Fear of Academic Year Loss	0.813	**0.860**	–	0.688	–	–
Psychological Distress	0.659	0.692	**0.848**	0.948	0.723	–

3.5.1. Testing for mediating role

This study has followed the guidelines of Rahi, Othman Mansour Majeed, Alghizzawi, and Alnaser Feras (2019) and Li, Yang, Wang, and Jia (2020) to test the mediating relationship. According to Rahi, Majeed, and Alghizzawi, & Alnaser Feras (2019), the indirect effect should be determined at the bias-corrected confidence interval (CI) with lower and upper value. If the bias-corrected confidence interval of bootstrap is entirely higher or lower than zero, it indicates an adequate mediation effect, which is significant at 0.05 level. As illustrated from Table 4, bootstrap results show that the indirect effect (e-Learning Crack-up - > Fear of Academic Year Loss - > Psychological Distress, ($\beta = 0.659^* 0.061 = 0.040$, t-values of 11.981, SE = 0.00017) was significant at $p < 0.001$. Extending to this indirect effect 0.040, bias-corrected boot CI (LL = 0.035, UL = 0.048) does not straddle a zero in between. These findings confirmed the significance of the indirect effect, which indicates that "Fear of academic year loss" mediates the relationship between "e-Learning Crack-up" and "Psychological Distress."

3.5.2. Importance-performance map analysis (IPMA)

Following the evaluation of the structural model, this research uses the Importance-Performance Map Analysis (IPMA) as an innovative approach to assessing psychological distress as the target variable in PLS-SEM. The main objective of the IPMA analysis is to identify the more important construct and therefore have a strong significant effect with a lower average latent variable score (Pisitsankkhakarn & Vassanadumrongdee, 2020). The process of measuring the IPMA followed by (Hair, Sarstedt, Ringle, & Gudergan, 2017; Pisitsankkhakarn & Vassanadumrongdee, 2020). Table 6 and Fig. 3 illustrate the result of IPMA that show the enhancement of psychological distress influenced by the "ELearning Crack-up" Perception with the highest total effect score of 0.997 at the performance level 71.837. This demonstrates that 1 unit increase of the "ELearning Crack-up" Perception will increase the yield of 0.997 units. Likewise, Fear of Academic Year Loss shows to enhance psychological distress with the total effect 0.061 at the performance level 72.654. In summary, to reduce the psychological distress among the college students' policymaker and/or government focus to overcome Fear of Academic Year Loss providing clear direction. The results indicate that these factors should be given a high priority to the government.

4. Discussion and implications

This study employed a mixed-method approach to explore the relationship between the perception of e-Learning crack-up and psychological distress among Bangladeshi college students while fear of academic year loss plays a significant mediating role. Students showed a higher level of psychological anxiety due to e-Learning crack-up during COVID-19 lockdown. The findings of this research confirmed the hypothesis that psychological distress was associated with the perception of e-Learning crack-up and fear of academic year loss. More importantly, this study found a positive association between "Fear of Academic year loss" and "Psychological distress."

Table 5
Predictive Relevance Analysis.

Construct	*R-Square*	*Q-Square*
Fear of Academic Year Loss	*0.434*	*0.249*
Psychological Distress	*0.996*	*0.656*

The result supported Hypothesis 1, which indicated that the perception of e-Learning crack-up among Bangladeshi college students was positively associated with psychological distress. In line with the aim, this study assesses students ' psychological distress during pandemic and explores factors influencing their anxiety. Specifically, findings found that online class registration procedures, tiny performance appraisal systems, one-way instructor support, and e-Learning content costs are relevant associated variables for more serious psychological distress. This result confirms previous work showing substantial cost hampering the efficacy of e-Learning (Wu, Tennyson, & Hsia, 2010).

Hypothesis 2 was also supported, showing that e-Learning crack-up perception is positively correlated with fear of academic year loss. Specifically, hard to understand the course (r = 0.643**) and login systems (enrollment procedure, r = 0.631**) are significantly correlated with fear of academic year loss. These findings of the emotional factors were supported by O'regan (2003). During COVID-19, the anxiety of college students could be associated with the consequences of ineffective study plans and professional development. The students ' anxiety, on the other hand, could be triggered by the gradually increasing distance from other students and teachers resulting from the quarantine. It is understood that anxiety disorders tend to occur and intensify in the lack of interpersonal communication.

In the end, findings suggested that fear of academic year loss has mediated the relationship between e-Learning crack-up and student's psychological distress and also supports Hypothesis 3. Due to resource inequality, some students can learn all lessons in real-time. But most of them do not get online lessons instantly. Many of those who may have Internet access facilities once a week cannot receive instructions

Table 4
Path Analysis of Psychological Distress.

Effect	Path	β	T-Statistics	P-Values	SE	Bias Corrected CI 2.5%	97.5%
Direct Effect	e-Learning Crack-up - > Fear of Academic Year Loss	0.659	16.864	0.000	0.00195	0.574	0.728
	e-Learning Crack-up - > Psychological Distress	0.956	283.457	0.000	0.00017	0.948	0.962
	Fear of Academic Year Loss - > Psychological Distress	0.061	14.926	0.000	0.00021	0.054	0.070
Indirect Effect	e-Learning Crack-up - > Fear of Academic Year Loss - > Psychological Distress	0.040	11.981	0.000	0.00017	0.035	0.048
Total Effect	e-Learning Crack-up - > Fear of Academic Year Loss	0.659	16.864	0.000	0.00195	0.574	0.728
	e-Learning Crack-up - > Psychological Distress	0.997	5114.516	0.000	0.00001	0.996	0.997
	Fear of Academic Year Loss - > Psychological Distress	0.061	14.926	0.000	0.00021	0.054	0.070

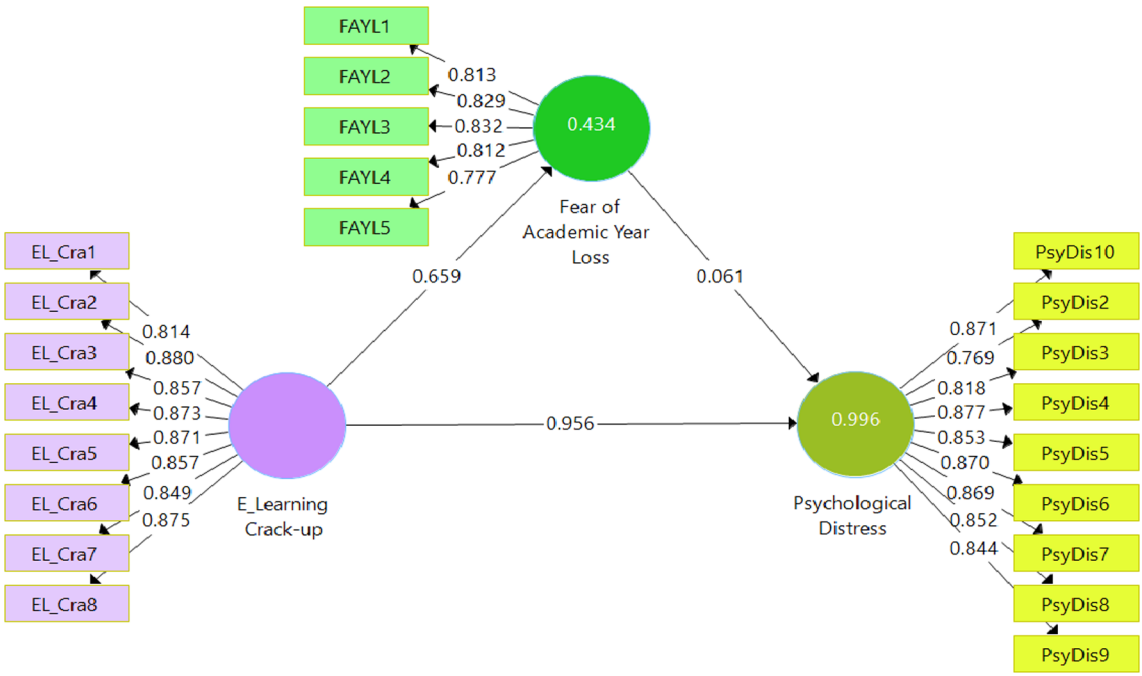

Fig. 2. Path analysis diagram.

Table 6
Importance-Performance Analysis.

	Importance	Performances
"ELearning Crack-up" Perception	0.997	71.837
Fear of Academic Year Loss	0.061	**72.654**

properly. Teachers also do not invest more time in overall instruction. Thus students affect emotional damage and increase the psychological distress of students.

Following our hypothesis, e-Learning stressors are linked to academic delays that affected student's mental well-being and were positively associated with anxiety symptoms of Bangladeshi college students during the lockdown. The pandemic will also have a significant impact on individuals and families in the long run. In Bangladesh, the government has implemented measures to reduce the pandemic that eventually disturbs and causes anxiety, including travel restrictions, and prolongs the closure of the schools. All schools and colleges have been closed and postponed classes until March 2020, or used remote learning methods. These initiatives certainly have a significant impact on student education and psychological growth.

4.1. Theoretical implications

This empirical study provides several important contributions to both theory and practice. In the context of theoretical implications, this study has adequately validated and extended the use of the Kessler psychological distress scale (*K*10) (Andrews & Slade, 2001) in a new setting and context, especially fear of loss of academic years. In contrast, our proposed model was added to the newly introduced factors that examined notable outcomes in the literature on psychological distress for college students. None of the existing studies on the investigation of psychological distress in general, that was influenced by fear of academic year loss in context of the social science. Besides, the proposed model clarifies 99% of the variability of psychological distress related to e-Learning crack-up perception. Altogether, the experimental

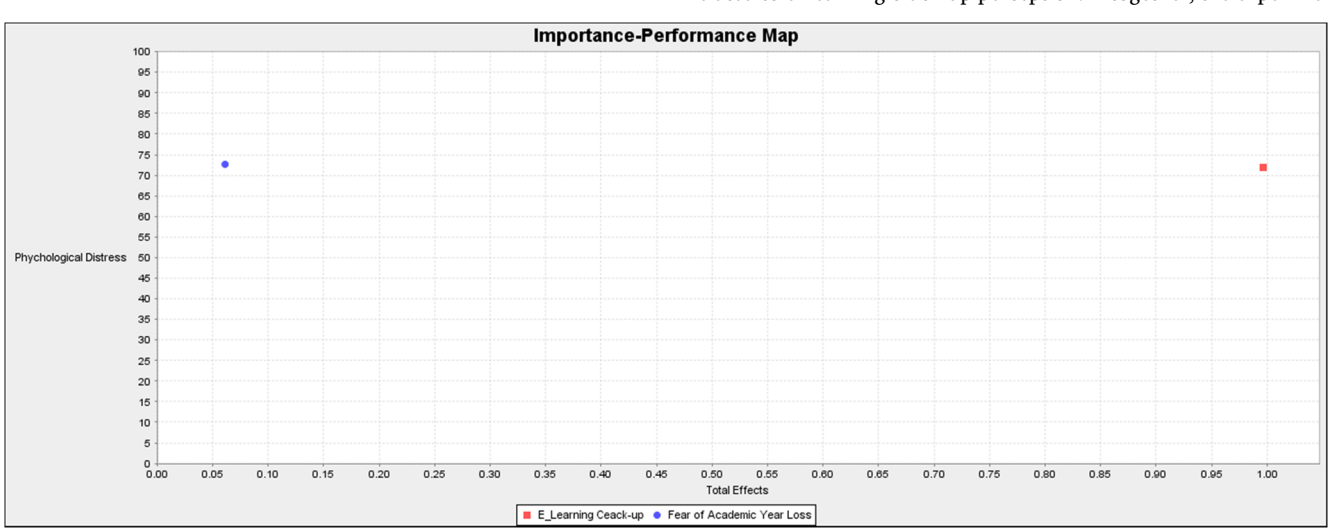

Fig. 3. Importance-performance map analysis.

findings indicate that the model can be increasingly useful in clarifying psychological distress in general and explicitly inside the college students.

4.2. Practical implications

Concerning the practical consequences, this research is the first one to report on the psychological distress among college students in Bangladesh due to institutional closure and public examination confusion during the COVID-19 pandemic. This research will help the government and educational policymaker recognize the mental health of the student and take more appropriate action to resolve this disease quickly. The findings of this study would also explore the understanding of knowledge about the associated factors that accounted for psychological distress. From our conceptual model, we conclude that successful e-Learning programs and the reduction of fear of loss of the academic year are central to the mental health of college students. There are several avenues to overcome psychological distress through institutional administration, and the instructor can address the associated factors. Institute and instructor counseling, providing attractive learning materials, secure internet access, efficient e-course module, can all support the positive perception of students, and ultimately improve their mental health.

5. Limitation and further research

Though this study investigates a significant outcome, however, it is not without limitations. First, samples were collected purposively from a specific target population. Whether it is unclear, the findings might not be generalized to other contexts. Further research could be conducted utilizing longitudinal design in a broad context among all groups of students except only college students. Another limitation is the simplicity of the analytical approach. The single mediating variable has been considered understanding the student's psychological distress. However, it is not a bad starting for conceptualization in this context. Further study may be conducted with a large sample, applying for a specific moderator role, and some control variables may be included in this model for further understanding of the complicated relationship. Likewise, further research could be investigated with other models.

6. Conclusion

This empirical study confirmed that college students are suffering from psychological distress due to ineffective e-Learning systems and fear of academic year loss. This study also offers promising alternative insights relevant to the development of students' mental health. Simultaneously, though e-Learning literature provides a consequent (Carpenter, Witherby, & Tauber, 2020; Ren, Dai, Zhao, Fei, & Gan, 2017) understanding of why students should worry about a academic year loss and how the individual perceived e-Learning crack-up is. It's indeed our expectation that the model would provide a valuable context for a deeper understanding of the mental health development of college students during the COVID-19 outbreak and that immediate focus on prevention measures is needed for this group of students.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgement

Authors would like to thank to Md Nazmul Islam, Assistant Professor, Mawlana Bhashani Science and Technology University, Bangladesh for his honorary assistant to technical support and data collection. We are grateful to the editor in chief and anonymous reviewers for their valuable comments to enhance the quality of our manuscript. Furthermore, I cannot disregard my wife's contribution keeping my brain free from stress for continuing my research during the COVID-19 lockdown.

Appendix A:. Weights and loadings of the measure of development outcomes

	Items	*Factor Loading*	*Standard Deviation*	*Kurtosis*	*Skewness*	*T Statistics*	*P Values*	*2.5%*	*97.5%*	*VIF*
EL_Cra1	Finding the course was clumsy	**0.814**	0.908	1.004	−1.006	32.634	0.000	0.756	0.851	2.387
EL_Cra2	Procedure of enrollment was not an easy task	**0.880**	0.939	0.993	−1.057	72.257	0.000	0.852	0.900	3.461
EL_Cra3	Task performance was not creative than text book	**0.857**	0.948	1.319	−1.157	60.871	0.000	0.824	0.878	3.030
EL_Cra4	Performance feedback was in general	**0.873**	0.97	0.756	−1.021	69.041	0.000	0.847	0.896	3.345
EL_Cra5	Instructor was supportive	**0.871**	1.031	0.875	−1.129	70.269	0.000	0.842	0.891	3.250
EL_Cra6	I did not like the students assessment procedure	**0.857**	0.983	0.396	−0.976	74.923	0.000	0.830	0.876	3.075
EL_Cra7	I was not easy to access internet	**0.849**	0.924	0.854	−1.024	59.451	0.000	0.820	0.873	2.950
EL_Cra8	E-Learning system is more costly rather than physical classroom	**0.875**	1.03	0.885	−1.151	76.900	0.000	0.850	0.896	3.375
FAYL1	It is uncertain, when academic session will start	**0.813**	0.96	0.706	−1.015	31.899	0.000	0.757	0.857	2.368
FAYL2	I am afraid with assessment systems if public examination may not be held	**0.829**	0.947	1.064	−1.078	32.851	0.000	0.770	0.865	2.471
FAYL3	I become nervous concerning academic year decision	**0.832**	0.932	0.541	−0.9	40.830	0.000	0.787	0.865	2.401
FAYL4	I am worried about future higher study because I probably would not admit myself	**0.812**	0.935	1.228	−1.169	38.143	0.000	0.765	0.847	2.090
FAYL5	I am afraid of losing academic year	**0.777**	0.958	1.597	−1.305	38.395	0.000	0.734	0.813	1.496
PhyDis1	I often feel tired out for no good reason	——	0.935	1.228	−1.169	——	——	——	——	——
PhyDis2	I often feel nervous	**0.769**	0.958	1.597	−1.305	21.065	0.000	0.684	0.827	2.106
PhyDis3	I often feel so nervous that nothing could calm me down	**0.818**	0.908	1.004	−1.006	35.204	0.000	0.767	0.852	2.530
PhyDis4	I often feel hopeless	**0.877**	0.939	0.993	−1.057	69.315	0.000	0.845	0.898	3.494
PhyDis5	I often feel restless or fidgety	**0.853**	0.948	1.319	−1.157	58.098	0.000	0.818	0.874	3.038
PhyDis6	I often feel so restless that I could not sit alone	**0.870**	0.97	0.756	−1.021	68.123	0.000	0.843	0.894	3.373
PhyDis7	I often feel depressed	**0.869**	1.031	0.875	−1.129	68.091	0.000	0.839	0.889	3.277
PhyDis8	I often feel that everything is not effort	**0.852**	0.983	0.396	−0.976	72.609	0.000	0.825	0.873	3.077
PhyDis9	I often feel so sad that nothing could cheer me up	**0.844**	0.924	0.854	−1.024	57.760	0.000	0.813	0.869	2.953
PhyDis10	I often feel worthless	**0.871**	1.03	0.885	−1.151	74.162	0.000	0.845	0.892	3.394

References

Abdollahi, A., Talib, M. A., Yaacob, S. N., & Ismail, Z. (2015). Problem-solving skills appraisal mediates hardiness and suicidal ideation among malaysian undergraduate students. e0122222 e122222 *PloS one, 10*(4), https://doi.org/10.1371/journal.pone.0122222.

Adam, T., Kaye, T., & Haßler, B. (2020). The Maldives and Sri Lanka: Question and Answer Session. (EdTech Hub Helpdesk Response No 18) DOI: 10.5281/zenodo.3885817. Available under Creative Commons Attribution 4.0 International.

Al-araibi, A. A. M., Mahrin, M. N. r. b., & Yusoff, R. C. M. (2019). Technological aspect factors of E-learning readiness in higher education institutions: Delphi technique. Education and Information Technologies, 24(1), 567-590. doi: 10.1007/s10639-018-9780-9.

Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. *International Journal of Information Management, 37*(3), 99–110. https://doi.org/10.1016/j.ijinfomgt.2017.01.002.

Alam, A. (2020). Challenges and possibilities of online education during Covid-19. *Preprints, 2020*, 2020060013. https://doi.org/10.20944/preprints202006.0013.v1.

Andrews, G., & Slade, T. (2001). Interpreting scores on the Kessler psychological distress scale (K10). *Australian and New Zealand Journal of Public Health, 25*(6), 494–497.

Araújo, F. J. d. O., de Lima, L. S. A., Cidade, P. I. M., Nobre, C. B., & Neto, M. L. R. (2020). Impact Of Sars-Cov-2 And Its Reverberation In Global Higher Education And Mental Health. Psychiatry Research, 288, 112977. doi: https://doi.org/10.1016/j.psychres.2020.112977.

Auxier, B,. & Anderson, M. (2020). As schools close due to the coronavirus, some U.S. students face a digital 'homework gap'. Retrieved from https://www.pewresearch.org/fact-tank/2020/03/16/as-schools-close-due-to-the-coronavirus-some-u-s-students-face-a-digital-homework-gap/.

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. *Human Behavior and Emerging Technologies, 2*(2), 113–115.

Baticulon, R. E., Alberto, N. R. I., Baron, M. B. C., Mabulay, R. E. C., Rizada, L. G. T., Sy, J. J., . . . Reyes, J. C. B. (2020). Barriers to online learning in the time of COVID-19: A national survey of medical students in the Philippines. medRxiv, 2020.2007.2016.20155747. doi: 10.1101/2020.07.16.20155747.

Bangladesh Bureau of Statistics (BBS). (2019). Multiple Indicator Cluster Survey (MICS) 2019. Retrieved fromhttp://bbs.portal.gov.bd/sites/default/files/files/bbs.portal.gov.bd/page/b343a8b4_956b_45ca_872f_4cf9b2f1a6e0/37817b8e25d0d6c1-f442e294921ff85e.pdf.

Beaunoyer, E., Dupéré, S., & Guitton, M. J. (2020). COVID-19 and digital inequalities: Reciprocal impacts and mitigation strategies. *Computers in Human Behavior, 111*, Article 106424. https://doi.org/10.1016/j.chb.2020.106424.

Bentler, P. M. (1989). *EQS structural equations program manual.* Los Angeles: BMDP Statistical Software.

Byrne, B. M. (2013). *Structural equation modeling with Mplus: Basic concepts, applications, and programming.* Routledge.

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research, 287*, Article 112934. https://doi.org/10.1016/j.psychres.2020.112934.

Carpenter, S. K., Witherby, A. E., & Tauber, S. K. (2020). On students' (Mis) judgments of learning and teaching effectiveness. *Journal of Applied Research in Memory and Cognition, 9*(2), 137–151. https://doi.org/10.1016/j.jarmac.2019.12.009.

Choi, B. (2020). I'm Afraid of not succeeding in learning: Introducing an instrument to measure higher education students' fear of failure in learning. *Studies in Higher Education, 1–15*. https://doi.org/10.1080/03075079.2020.1712691.

Cook, D. A. (2009). The failure of e-learning research to inform educational practice, and what we can do about it. *Medical Teacher, 31*(2), 158–162. https://doi.org/10.1080/01421590802691393.

Cooper, I., Mondal, A., & Antonopoulos, C. G. (2020). A SIR model assumption for the spread of COVID-19 in different communities. *Chaos, Solitons & Fractals, 110057*. https://doi.org/10.1016/j.chaos.2020.110057.

Crooks, C. V., Smith, A. C. G., Robinson-Link, N., Orenstein, S., & Hoover, S. (2020). Psychosocial interventions in schools with newcomers: A structured conceptualization of system, design, and individual needs. *Children and Youth Services Review, 112*, Article 104894. https://doi.org/10.1016/j.childyouth.2020.104894.

Dewaele, J. M., Magdalena, A. F., & Saito, K. (2019). The effect of perception of teacher characteristics on Spanish EFL learners' anxiety and enjoyment. *The Modern Language Journal, 103*(2), 412–427. https://doi.org/10.1111/modl.12555.

Eom, T., Han, H., & Song, H. (2020). Discovering the perceived attributes of CBT destination travelers in South Korea: A mixed method approach. *Tourism Management, 77*, Article 104013. https://doi.org/10.1016/j.tourman.2019.104013.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50.

Hair, J. F., Jr, Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research, 109*, 101–110. https://doi.org/10.1016/j.jbusres.2019.11.069.

Hair, J. F., Jr, Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM).* Sage Publications.

Hair, J. F., Jr, Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: Updated guidelines on which method to use. *International Journal of Multivariate Data Analysis, 1*(2), 107–123.

Hair, J. F., Jr, Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling* (3rd ed.). SAGE Publications Inc.

Hasan, K. (2020, May 16, 2020). Education during Covid-19: Experts fear students may not return to school. Dhaka Tribune. Retrieved from https://www.dhakatribune.com/bangladesh/2020/05/16/education-during-covid-19-experts-fear-students-may-not-return-to-school.

Hasan, N., Miah, S. J., Bao, Y., & Hoque, M. R. (2019). Factors affecting post-implementation success of enterprise resource planning systems: A perspective of business process performance. *Enterprise Information Systems, 13*(9), 1217–1244.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1), 115–135.

Hu, L.-T., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods, 3*(4), 424.

Huffman, S. (2018). The digital divide revisited: What is next? *Education, 138*(3), 239–246.

IAU. (2020). Covid-19: Higher Education challenges and responses. Retrieved July 06, 2020, from https://www.iau-aiu.net/Covid-19-Higher-Education-challenges-and-responses.

Islam, F., Rahman, A., Halim, A., Eriksson, C., Rahman, F., & Dalal, K. (2015). Perceptions of health care providers and patients on quality of care in maternal and neonatal health in fourteen Bangladesh government healthcare facilities: A mixed-method study. *BMC Health Services Research, 15*(1), 237. https://doi.org/10.1186/s12913-015-0918-9.

Jæger, M. M., & Blaabæk, E. H. (2020). Inequality in learning opportunities during Covid-19: Evidence from library takeout. *Research in Social Stratification and Mobility, 68*, Article 100524. https://doi.org/10.1016/j.rssm.2020.100524.

Jiang, S. (2020). Psychological well-being and distress in adolescents: An investigation into associations with poverty, peer victimization, and self-esteem. *Children and Youth Services Review, 111*, Article 104824. https://doi.org/10.1016/j.childyouth.2020.104824.

Kapasia, N., Paul, P., Roy, A., Saha, J., Zaveri, A., Mallick, R., ... Chouhan, P. (2020). Impact of lockdown on learning status of undergraduate and postgraduate students during COVID-19 pandemic in West Bengal India. *Children and Youth Services Review, 116*, 105194. https://doi.org/10.1016/j.childyouth.2020.105194.

Kim, J. H. (2019). Multicollinearity and misleading statistical results. *Korean Journal of Anesthesiology, 72*(6), 558–569. https://doi.org/10.4097/kja.19087.

Lee, J. (2020). Mental health effects of school closures during COVID-19. *The Lancet Child & Adolescent Health, 4*(6), 421. https://doi.org/10.1016/S2352-4642(20)30109-7.

Leguina, A. (2015). A primer on partial least squares structural equation modeling (PLS-SEM). *International Journal of Research & Method in Education, 38*(2), 220–221. https://doi.org/10.1080/1743727X.2015.1005806.

Li, X., Yang, H., Wang, H., & Jia, J. (2020). Family socioeconomic status and home-based parental involvement: A mediation analysis of parental attitudes and expectations. *Children and Youth Services Review, 116*, Article 105111. https://doi.org/10.1016/j.childyouth.2020.105111.

Miah, S. J., Hasan, N., Hasan, R., & Gammack, J. (2017). Healthcare support for underserved communities using a mobile social media platform. *Information Systems, 66*, 1–12. https://doi.org/10.1016/j.is.2017.01.001.

Muthén, L. K., & Muthén, B. O. (2002). How to use a Monte Carlo study to decide on sample size and determine power. *Structural Equation Modeling, 9*(4), 599–620.

NDTV. (2020, March 26, 2020). Teachers' Stir, And Now COVID-19 Lockdown, Delhi University Students Fear Losing Year. Retrieved from https://www.ndtv.com/education/india-lockdown-teachers-stir-and-now-coronavirus-delhi-university-students-fear-losing-year-2201302.

O'regan, K. (2003). Emotion and e-learning. Journal of Asynchronous learning networks, 7(3), 78-92.

Penna, M., & Stara, V. (2007). The failure of e-learning: Why should we use a learner centred design. *Journal of e-Learning and Knowledge Society, 3*(2), 127–135.

Pisitsankkhakarn, R., & Vassanadumrongdee, S. (2020). Enhancing purchase intention in circular economy: An empirical evidence of remanufactured automotive product in Thailand. *Resources, Conservation and Recycling, 156*, Article 104702. https://doi.org/10.1016/j.resconrec.2020.104702.

Rahi, S., Othman Mansour Majeed, M., Alghizzawi, M., & Alnaser Feras, M. (2019). Integration of UTAUT model in internet banking adoption context: The mediating role of performance expectancy and effort expectancy. Journal of Research in Interactive Marketing, 13(3), 411-435. doi: 10.1108/JRIM-02-2018-0032.

Rehman Khan, S. A., & Yu, Z. (2020). Assessing the eco-environmental performance: An PLS-SEM approach with practice-based view. *International Journal of Logistics Research and Applications,* 1–19.

Ren, Y., Dai, Z.-X., Zhao, X.-H., Fei, M.-M., & Gan, W.-T. (2017). Exploring an online course applicability assessment to assist learners in course selection and learning effectiveness improving in e-learning. *Learning and Individual Differences, 60*, 56–62. https://doi.org/10.1016/j.lindif.2017.09.002.

Richard, F., & Anthony, C. (2019). A Rising Share of Undergraduates Are From Poor Families, Especially at Less Selective Colleges. Retrieved July 06, 2020, from https://www.pewsocialtrends.org/2019/05/22/a-rising-share-of-undergraduates-are-from-poor-families-especially-at-less-selective-colleges/.

Robert, C., & Casella, G. (2013). *Monte Carlo statistical methods.* Springer Science & Business Media.

Rohman, M., Marji, D. A. S., Sugandi, R. M., & Nurhadi, D. (2020). Online learning in higher education during covid-19 pandemic: students' perceptions. *Journal of Talent Development and Excellence, 12*(2s), 3644–3651.

Shen, M., Peng, Z., Guo, Y., Rong, L., Li, Y., Xiao, Y., ... Zhang, L. (2020). Assessing the effects of metropolitan-wide quarantine on the spread of COVID-19 in public space and households. *International Journal of Infectious Diseases, 96*, 503–505. https://doi.org/10.1016/j.ijid.2020.05.019.

Sintema, E. J. (2020). Effect of COVID-19 on the performance of grade 12 students: Implications for STEM education. *Eurasia Journal of Mathematics, Science and*

Technology Education, 16(7) em1851.

Ssekakubo, G., Suleman, H., & Marsden, G. (2011). Issues of adoption: have e-learning management systems fulfilled their potential in developing countries? Paper presented at the Proceedings of the South African Institute of Computer Scientists and Information Technologists conference on knowledge, innovation and leadership in a diverse, multidisciplinary environment.

Temsah, M.-H., Al-Sohime, F., Alamro, N., Al-Eyadhy, A., Al-Hasan, K., Jamal, A., ... Somily, A. M. (2020). The psychological impact of COVID-19 pandemic on health care workers in a MERS-CoV endemic country. *Journal of Infection and Public Health, 13*(6), 877–882. https://doi.org/10.1016/j.jiph.2020.05.021.

Teo, T. S. H., Kim, S. L., & Jiang, L. (2020). E-learning implementation in South Korea: Integrating effectiveness and legitimacy perspectives. *Information Systems Frontiers, 22*(2), 511–528. https://doi.org/10.1007/s10796-018-9874-3.

Thongsri, N., Shen, L., & Bao, Y. (2019a). Investigating academic major differences in perception of computer self-efficacy and intention toward e-learning adoption in China. *Innovations in Education and Teaching International, 1–13*. https://doi.org/10.1080/14703297.2019.1585904.

Thongsri, N., Shen, L., & Bao, Y. (2019b). Investigating factors affecting learner's perception toward online learning: Evidence from ClassStart application in Thailand. *Behaviour & Information Technology, 38*(12), 1243–1258. https://doi.org/10.1080/0144929X.2019.1581259.

Uddin, M. N., Islam, F. M. A., & Al Mahmud, A. (2018). Psychometric evaluation of an interview-administered version of the Kessler 10-item questionnaire (K10) for measuring psychological distress in rural Bangladesh. *BMJ Open, 8*(6), Article e022967. https://doi.org/10.1136/bmjopen-2018-022967.

WHO. (2020). WHO Coronavirus Disease (COVID-19) Dashboard. Retrieved July 06, 2020, from https://covid19.who.int/.

Wong, K. K.-K. (2013). Partial least squares structural equation modeling (PLS-SEM) techniques using SmartPLS. *Marketing Bulletin, 24*(1), 1–32.

Wong, Y. C., Ho, K. M., Chen, H., Gu, D., & Zeng, Q. (2015). Digital divide challenges of children in low-income families: The case of Shanghai. *Journal of Technology in Human Services, 33*(1), 53–71.

Wu, J.-H., Tennyson, R. D., & Hsia, T.-L. (2010). A study of student satisfaction in a blended e-learning system environment. *Computers & Education, 55*(1), 155–164.

Yen, T.-F. T. (2020). The performance of online teaching for flipped classroom based on COVID-19 aspect. *Asian Journal of Education and Social Studies,* 57–64.

Zhou, L., Wu, S., Zhou, M., & Li, F. (2020). 'School's Out, But Class' On', The Largest Online Education in the World Today: Taking China's Practical Exploration During The COVID-19 Epidemic Prevention and Control As an Example. Best Evid Chin Edu 2020; 4(2):501-519. http://dx.doi.org/10.2139/ssrn.3555520.