Learning Online Sustainable Education Projects and Students Behavioral Intentions during Covid-19

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ABSTRACT

COVID-19 changed working and learning mechanism around the globe. Most of the business, services sectors including education started their functions in online mode. This study investigated the intentions and use behaviors of the students to accept information and mobile technology for the learning processes in Higher Education Institutions (HEIs) in Asian Countries Pakistan, Bangladesh and China. Multi-method was applied to get the objectives of the model using Unified Theory of Acceptance and Use of Technology (UTAUT) model and theory of planned behaviors. Focus Group Discussion from Bangladesh and the case study of China and the cross-sectional data result shows that university student's acceptance of information system based learning is reasonably well. However, students were feeling anxiety due to load shedding and change in routine, therefore, the result showed negative relation with the intentions to use information system and mobile for online learning.

Moreover, the learners also demanded for the implementation IR4.0 in Pakistan and Bangladesh has got full support for online teaching-learning and services like research.

Keywords: COVID-19; online Teaching and learning; South Asian Countries, Higher Education; Social and Psychological Safety during COVID-19

INTRODUCTION

COVID-19 outbreaks forced individuals, groups and organizations to get locked, but they devised online learning, working and other operations (Hendrickson, 2020; Ferdig et al., 2020).

Learning organizations like universities, developed proactive strategies, policies and frameworks to cope with unwanted situation

to continue smoother learning curve (Mohan et al., 2020; Xue et al., 2020; Izumi et al.,2020). The higher education commission (HEC) Pakistan, Bangladesh and China with the consultation of Ministries of Education in the respective countries decided to continue online learning for the social, emotional, psychological, ethical and cognitive development of the learners. Under the clear directions of HEC of South Asian Countries like Pakistan, Bangladesh, China universities' leadership tighten their laces and backs to change the threat into an opportunity and give new direction and philosophies to the teaching-learning processes. The perceptive education sector among these countries with the assistance of education commission developed Standard Operating Procedures (SOPs), keeping in view the underlying situations of the respective countries, for the university readiness, faculty readiness and student's readiness to for implementation error free teaching-learning processes. The model resulted, up to some extent in the big cities, but in towns and far-flung areas, it failed to give the desired results.

This study has focused to find out the most important and contributing factors for the usage of information system and handheld devices for the learning purposes in the abnormal situations like COVID-19, that whether, information and communication technologies, builds resilience among the learners, provide them social and psychological safety and more importantly the contiguity for their learning processes or not. Beside this, if we search, all online learning models have been developed in the normal situation, where learner social, psychological safety were not at risk and there was no resistance towards contiguity and learners' resilience, therefore, all

previous models and theories lacks to cover abnormal situation like COVID-19.

Moreover, World's largest Learning Management System (LMS) and online learning system like Coursera, edX, Khan Academy, Udemy, iTunesU Free Courses, MIT Open Course Ware, Stanford Online, Codecademy and Open Culture Online Courses failed to build resilience among learners, provide them social and psychological safety will make them worry and create fears concern like accreditations, verification and credits hours transferring. Main focus of the study was to assess the social, psychological support and the level of anxiety among the learner, therefore, all demographic variables of the UTAUT model, and effect of effort expectancy, performance expectancy, social influence and facilitating conditions were kept constant and their quantitative assessment were not carried out, because major previous studies, have rendered consistent results regarding them (Zhang et al., 2018; Alonso et al., 2018; Zhang, Welch, & Miao 2018; Williams et al., 2017; Bundy et al., 2017; Al-Ajlouni et al., 2019; Canessa et al., 2017; Chao, 2019; Alhabeeb & Rowley, 2017)

LITERATURE REVIEW

Technology integration in teaching-learning processes has not become a need, it is essential to develop more robust infrastructure for the online mode of education (Gao, 2019; Hendrickson, 2020). Students want to learn with social, moral, ethical and psychological integrity and support in normal and abnormal days, without any physical violence, hurts and disturbance (Hager & Marc, 2019; Hoque & Sorwar 2017; Isaac, Abdullah, Aldholay, & Ameen 2019). Psychologically also, learning remains productive, when the learner is at ease, safe and secure because these elements keep active the cashing,

capturing, learning and receptive parts remain active, motivated and accelerated (Chao, 2019; Junior & Santos, 2017). Learners feel stronger when they are independent from the external pressures, do best to explore their inner and hidden potentials and capacities, which pushes the learner to self-actualization phase (Mwalumbwe & Mtebe 2017). Physical, social, moral, psychological and emotional safety is the basic right of every human being, therefore, has been included in corporate and governance policies around the globe. Safety and security provides effort expectancies, performance expectancy and improvement. According to Hoque & Sorwar (2017) and Williams et al., (2017) workers are expected to deliver more, and their behavioral control increases, when they feel safe and secure from all aspect and respects.

Similarly, the findings of the Panigrahi, Srivastava & Sharma (2018) stated that consciously and unconsciously performer does best when their ergonomics are taken care. The ergonomics should not be limited only to the working conditions but should include the social, emotional and psychological safety and security.

According to Edwin Guthrie contiguity theory, association may become stronger between learners and learning, when it is continuous, smooth and with long lasting social and psychological support (Sadaf & Johnson 2017). Similarly, if we take Maslow theory of needs, McClelland's Human Motivation Theory, or Alderfer's existence-relatedness-growth theory, all argue for the safety and security of the agents, at all levels and tiers (Khechine, Raymond, & Augier 2020; Murray et al. 2013; Alonso et al. 2018). Beside all above evidences, if we look into the history, Sommer Braut & Njå (2013) has presented a model, in which they described the process of learning in emergency and crises like Corona and they take individual and society both to responds and should be aligned to the social and individual needs, concerns and requirements. Similarly, Hites et al., (2014) postulated model for learning in emergency that the individual should be provided with social support and behavioral control for the continuity and contiguity of learning. Additionally, Murray et al., (2013) had demanded for the latest technological installation for the smoother learning in normal and abnormal days for collaborative scenario modeling and special connectivity of the learning. These models and theories also support the social safety and contiguity for the learning process, therefore demands for the deployment of the latest technological tools.

There are many theories and previous research findings, which talks about the acceptability and applicability of the technology in our individual, grouped and organizational lives. Theory of planned behaviors talks about the behavioral aspects of the user's intentions and actual use of the technology in their daily operations (NiuLung-Guang 2019; Gao, 2019). Similarly, socio-technology theory focuses on the deployment of the technology for the effective and efficient production and operational processes (Peechapol et al., 2018; Gao, 2019). Moreover, Organizational Theory and New Institutional Theory support the, acceptance and applicability of information and communication technologies for sustainability, maintainability and development (Kao Lin & Chien 2018; Kanwal & Rehman, 2017). Especially theory of Interpersonal Behavior and Theory of Reasoned Actions are more engaged with individual engagement in certain behavior in certain space and time. Further it states that behaviors are driven by behavior's

Intentions, which is further based on three constructs of an individual's attitude performance expectancy, effort expectancy, social norms, and facilitating conditions. It guides individual Intentions to actions positive attitude and behaviors, supported by favorable social norms, facilitating conditions, high level of perceived performance and effort expectancy are the best predictors for behavioral Intentions and use behaviors (Steinmetz et al., 2016; Hites et al., 2014; Kanwal & Rehman, 2017).

Similarly, according to human psyche, it adopts all those objects, which are productive, facilitative, provide them better behavioral command and control (Hori et al., 2016). So many external stimuli exert their forces to change our behaviors voluntarily or involuntarily by stating their assumed usability, utility and better control mechanism. We act upon certain reasons, logics and from a construct which influence our decision (Panigrahi, Srivastava & Sharma 2018; Beach, 2017). Therefore, we can easily extend the UTAUT model towards operating and benefiting LMS. For the current research, we have considered the UTAUT model. However, some additional variables are added in the model, based on the prevailing crises of corona, that how online LMS proved social, emotional and psychological safety and security without compromising on their learning processes. Based on the previous studies results and theories extensions, variables of effort expectations, performance expectancy, social influence, and facilitating condition have been found supporting exogenous variables to the behavioral Intentions and use behaviors. The variables i.e. "Effort Expectation" "Performance expectancy", "Social Influence" and "Facilitating Conditions" were taken from the UTAUT model (Kanwal & Rehman 2017; Sadaf &

Johnson, 2017). The construct of social and psychological safety has roots distributive justice, contiguity behavioral learning theory and Maslow's theory of human needs and organizational theories respectively. These theories analyses behavioral intentions and technology acceptance and usage and the social prevailing conditions, which even force the learners to go for the online classes (Hites et al., 2014; Alonso et al., 2018; NiuLung-Guang 2019).

Unified Theory of Acceptance and Use of Technology (UTAUT) focus more on the behavioral intentions of the user to adopt technology of any kind and type not only limited to the adaptation of mobile and information technology in their learning and working operations (Zhang et al., 2017; Kanwal & Rehman, 2017). This theory provides unified view and ground for the different perspective form the personal, social and organizational live, which need to be taken into consideration while accepting any technology. Due to versatility of the UTAUT model, it proved its applicability in different domains and has been extended to different walk of lives. UTAUT has same utility for the academia and has been used to measure the applicability and acceptability of the technology for learning and management system (Dağhan & Akkoyunlu 2016; Zhang, Welch & Miao, 2018).

UTAUT is basically derived from Theory of Reasoned Actions (TRA), but it has equal roots in Theory of Planned Behaviors (TPB), Information System Theory, Unified Theory of Acceptance and Use of Technology (UTAUT), Theory of Interpersonal Behaviors (TIB), and Decomposed Theory of Planned Behaviors (DTPB) (Wang & Xiao 2018; Khechine, Raymond & Augier 2020; Gunasinghe, Khatibi & Azam 2019). One of the main premises of the UTAUT is that how much technology is easy to operate and how much

it is considered useful, easy and effective for the tasks assigned (Hori et al., 2016). In learning and management system also, the penetration of the ICT is unavoidable, students and teachers are moving towards paperless environment, getting notes and lectures on smart phones and information system (Steinmetz et al., 2016). The increasing access to ICT creates a new paradigm for education known as online learning. Therefore, universities around the world have started to revise their strategies in order to adopt technologies that assist in achieving their pedagogical goals. Coursera, MOOC, MIT, Virtual University of South Asian Countries like, china, Pakistan, Bangladesh and NPTL of India are the examples of the online learning management system, which are operating around the clock at click and learner around the world are benefitting from it. Underdeveloped countries like Nigeria has developed its open course where system, where students around the country access NOUN OCW (National Open University of Nigeria, Open Courseware) (Sommer, Braut & Njå 2013; Mwalumbwe & Mtebe 2017). Similarly, the concept of Learning Factory (LF) especially for the humanity and language subjects cannot be implemented without ICT support in normal and rainy days. These all factors forces that the learning organizations need to be transformed at the faster pace due to technology disruption for effective and productive performance beside stakeholders' satisfactions.

Students' and employed teachers' frustrations, psychological impacts are observed whereas Andalib and Halim, (2019) has proposed about the conceptual framework to deal with the significant factors to reduce negative impacts. On the other hand, to reduce the challenging atmosphere in the career field and to channelize the negativity to the positive approach Andalib et al., (2020) also have focused on the entrepreneurial side of the institutions or any organizations to deal with the demanding changes. Previously, through FGD data Andalib et al., (2020) have also emphasized the financial establishment and support of the institutions through which the other factors like remuneration, technological modifications are dealt with. Therefore, we can rightly conclude that LMS is one of the rapidly-emerging technologies and widely used in higher education. Proposed research model illustrated in Figure 1
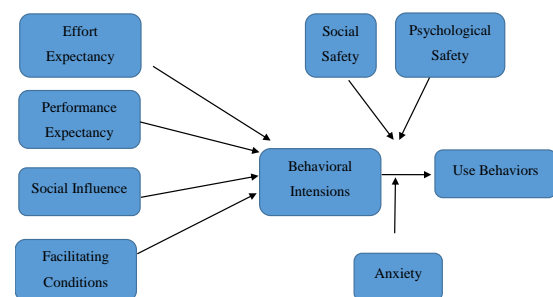

Figure 1: Hypothesis development and research model

H1: Effort expectancy has significant effect on use behaviors with moderation of social safety and mediation of behavioral intension.

H2: Effort expectancy has significant effect on use behaviours with moderation of Psychological safety and mediation of behavioural intension.

H3: Effort expectancy has significant effect on use behaviours with moderation of anxiety and mediation of behavioural intension.

H4: Performance expectancy has significant effect on use behaviours with moderation of social safety and mediation of behavioural intension.

H5: Performance expectancy has significant effect on use behaviours with moderation of

psychological safety and mediation of behavioural intension.

H6: Performance expectancy has significant effect on use behaviours with moderation of anxiety and mediation of behavioural intension.

H7: Social influence has significant effect on use behaviours with moderation of social safety and mediation of behavioural intension.

H8: Social influence has significant effect on use behaviours with moderation of psychological safety and mediation of behavioural intension.

H9: Social influence has significant effect on use behaviours with moderation of anxiety and mediation of behavioural intension.

H10: Facilitating condition has significant effect on use behaviours with moderation of social safety and mediation of behavioural intension.

H11: Facilitating condition has significant effect on use behaviours with moderation of psychological safety and mediation of behavioural intension.

H12: Facilitating condition has significant effect on use behaviours with moderation of psychological safety and mediation of behavioural intension.

MATERIALS AND METHODOLOGY

Mixed research approach was adopted in this project. In the first phase of the study, interview was conducted with 19 experts and educational leaders with the major consent to know the behavioural intensions of the student in online learning during Covid-19? The experts were of the opinions that 'yes', information system and mobile technology has developed its capacity and capability, it contains such routine, programs and subroutines, which help in online teaching-learning process. They further added that information system and mobile technology provide platform for

independent and self-paced learning, has resolved much of the learning issue, but still anxiety remains, because logistic and infrastructural support in the developing countries are robust as should be. Similarly, Focus group discussion was added to the study from Bangladesh, where all critical factors were graded more crucial to the online learning processes. Similarly, case study of china has been added to cook the concepts and get lesson learnt. Moreover, quantitative cross-sectional survey was conducted and data was collected from registered public and private sector universities of South Asian Countries like Pakistan, Bangladesh, and 392 graduate and undergraduate students participated in the survey. Stratified random sampling technique was adopted purposely to give proper presentation to all faculties registered with Higher Education Commission (HEC) of South Asian Countries like, China, Pakistan and Bangladesh. This sampling technique was adopted on the recommendation for the search in social and management sciences to cover wider geographical area with proper presentation to all kind of nominees of the population (Geereddy, 2017; Leavitt, 2011). Questionnaire adapted from previous studies was used to get the objectives of the study. In the second phase of the sampling, quota (purposes) sampling technique was adopted to get data only from faculty and learners having experiences using information and communication system for year to make the study more meaningful (Akgün et al., 2007; Alhabeeb & Rowley, 2017; Birmingham, 2015).

ANALYSIS AND DISCUSSION

This section presents the demographic information on the final 392 respondents retained in the study. The specific demographic information sought in the

study includes the respondents' age, qualification. In additional, some basic information relating to the respondents' network patronage was also collected as part of screening purposes. The following Table 1 presents the demographic information of the respondents.

Table 1: Demographic Information of the respondent

Items		Frequency	Percentage
Type of university	Public	207	47.2%
	Private	185	52.8%
Qualification	BS	13	3.3%
	MS	171	43.6%
	PhD	208	53.1%
Experience using Information System	1-5 years	193	49.23%
	6-10 years	122	31.12%
	11-15 years	47	11.98%
	More than 15 years	30	7.6%
Experience using Mobile technology	1-5 years	201	51.27%
	6-10 years	138	35.20%
	11-15 years	53	13.52%
Faculty Details	Social Science	211	53.8%
	Engineering Sciences	106	27.0%
	Medical Sciences	75	19.1%
	Total	392	100%

CONFIRMATORY FACTOR ANALYSIS

Measurement model exhibits the relationship between manifest variables and their underlying construct (i.e., latent variable). Structural model shows causal relationship among the measurement models which is commonly driven by research hypotheses. Before assessing structural model, measurement model must be first assessed.

Table 2: CFA Table for Research Constructs

Construct	No. of item*	Factor Loading**	AVE	CR	χ^2/df	Goodness of Fit Indices		
						Q^2	R^2	F^2
EE	6	.748 - .901	.688	.901	1.170	0.254	0.451	0.295
PE	4	.764 - .936	.681	.922	2.696	0.17	0.438	0.201
SI	5	.832 - .854	.743	.917	1.276	0.203	0.444	0.086
FC	4	.826 - .839	.744	.927	2.924	0.272	0.209	0.380
C	4	.744 - .840	.611	.852	1.813	0.291	0.437	0.020
SS	6	.714 - .869	.675	.894	2.904	0.211	0.342	0.200
PS	6	.766 - .886	.666	.915	2.471	0.293	0.446	0.091
BI	4	.772 - .879	.714	.923	2.155	0.254	0.451	0.402
UB	4	.753 - .835	.718	.922	1.915	0.17	0.438	0.024

Table 2 shows that all factor loadings are acceptable, which are greater than 0.700. Based on the factor loadings, AVE and CR were computed. Similarly, AVEs of constructs are also high, range between .678

and .740 for constructs under study, and between .681 and .744. Moreover, CR of all the constructs indicating internal consistency of measurement items is also in high level. CR values of for the organizational learning effectiveness are greater than .852. Based on the factor loadings, AVEs, and CRs, the criteria of convergent validity are successfully fulfilled for all the indicators of each variable. In conclusion; for each construct, all the items are one-dimensional and converge or share a high proportion of variance in common. Similarly, Assessment of Predictive Accuracy, Effect Size, and Predictive Relevance (Q^2, R^2, F^2) falls in the acceptable range, therefore, the model is fit enough to go for the research study comprehensively.

HTMT CRITERION

The third and most recently advanced method of establishing discriminant validity is through the HTMT criterion advanced by (Ashkanasy 2016). The HTMT refers to the average of the correlations of indicators between different constructs, relative to the average of the correlations of indicators within the same construct (Ashkanasy 2016; Canessa-Terrazas & Morales-Flores 2017). The HTMT ratio is suggested as a better and more stringent criterion for assessing discriminant validity. In using the HTMT

ratio to assess discriminant validity, the presence of ratios closer to one is considered an evidence of lack of discriminant validity between constructs. There are two cut-off ratios that are often considered in HTMT evaluation: (1). the conservative ratio of 0.9 (HTMT.90) advocated by Gold et al., (2001) or (2) The stringent ratio of 0.85 (HTMT.85) advocated by Kline (2011). The cut-off ratio of 0.85 (HTMT.85) is however noted as offering the best criterion when compared to all other methods of assessing discriminant validity (Ramayah et al., 2016). Thus, any inter-construct ratio greater than 0.85 would be considered as having poor discriminant validity.

The HTMT ratios obtained in this study as shown in Table 3 clearly indicates that there is no problem of discriminant validity between the constructs. The highest inter-construct HTMT recorded is the value of 0.84 (i.e., between ETH and LEG). This value is below 0.85, and as such there is sufficient evidence of discriminant validity in the study.

Table 3: The HTMT Values

	EE	PE	SI	FC	C	SS	PS	BI	UB
EE	0.702								
PE	0.079	0.636							
SI	0.057	0.524	0.459						
FC	0.099	0.841	0.476	0.630					
C	0.060	0.675	0.386	0.523	0.458				
SS	0.076	0.508	0.525	0.454	0.403	0.642			
PS	0.078	0.599	0.637	0.534	0.433	0.759	0.643		

BI	0.048	0.533	0.608	0.440	0.449	0.685	0.791	0.643	
UB	0.841	0.476	0.841	0.476	0.841	0.476	0.841	0.541	0.624

Fornell-Larcker Criterion

Going by the Fornel-Larcker criterion, discriminant validity is confirmed by comparing the correlation estimates between the constructs and the square root of the average variance extracted of the respective constructs (Fornell and Larcker, 1981). Discriminant validity is confirmed if (1) correlation estimates among construct does not exceed 0.85, and (2) the square root of the AVE is greater than the correlation estimates of other constructs (Fornell and Larcker 1981). As can be seen in Table 3, discriminant validity is established in this study, as the values of inter construct correlation are less than 0.85. Also, all the squared roots of AVE for each construct (i.e., the diagonal values presented in bold fonts) are greater than the off-diagonal correlation values with other constructs. These results thus provide sufficient evidence of discriminant validity of the constructs.

Table 4: Squared Roots of AVEs

	EE	PE	SI	FC	C	SS	PS	BI	UB
EE	0.824								
PE	0.037	0.747							
SI	-.018	0.357	0.780						
FC	0.082	0.569	0.362	0.753					
C	0.022	0.445	0.288	0.380	0.708				
SS	0.044	0.363	0.428	0.362	0.308	0.822			
PS	0.063	0.423	0.508	0.415	0.328	0.630	0.797		
BI	0.0377	0.319	0.422	0.298	0.283	0.483	0.552	0.738	
UB	0.022	0.445	0.288	0.380	0.708	0.313	0.207	o.45 9	0.814

To assess the student Intentions in online learning, Bootstrap algorithm was applied on the model. In the model, beside the actual constructs of the UTAUT model, moderating effect of social and psychological safety and anxiety was assessed with the behaviour Intentions and actual use of the information system devices like mobile (Smart Phone), laptop, personal computer and other electronic devices. The model is given in Figure 2.
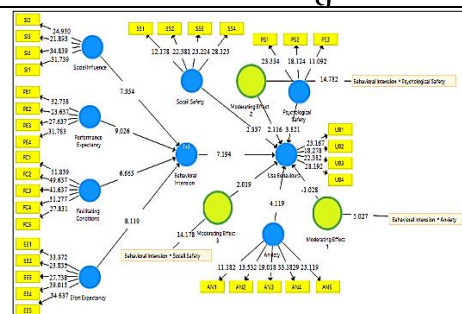

Figure 2: PLS Bootstrapping Results to Assess the effect of the Online Learning Intentions

Hypothesis for the moderating effect of social safety and psychological safety with effort expectancy, performance expectancy, social influence and facilitating conditions has significant effects on use behaviors and with the moderation of social safety and mediation of intension to use. All dependent, dependent and moderating variables i.e. social safety, psychological safety, effort expectancy, anxiety, social influence and performance expectancy factors are above 1.96, therefore, all of the items have been loaded fully to their respective constructs and are reliable. Similarly, the moderating effect of social safety and psychological safety is positive, which indicates that student were feeling social and psychologically safe and secure during online classes in COVID-19. But moderating effect of anxiety remained negative while assessing its effect, which means, that student felt boredom and anxiety during online classes. As mentioned in the research methodology phase, the study was conducted in two phases i.e. survey and feedback through online interview, the students urged that there were many reasons for anxiety, where the change of routines and the self-isolation pushed us towards depression and anxiety. Secondly, in South Asian Countries like Pakistan, Bangladesh and etc. Infrastructure for 3G and 4G has not been developed and not available in the off-cities localities, which added to their depression; fear to miss the class and eventually anxiety. Moreover, the light/energy load-shedding added further added to our anxiety, that in extreme hot weather, pressure of study, self-isolation and the fear of missing classes and assignments, many of the student froze the semester, some dropped the technical and analytical subjects. The findings can also be supported from Table 4.

Table 5: Hypothesis Testing

So no	Hypothesis	Path Co-efficient	T-Value	P-value	LL	UL	Decision on hypothesis
1	EE*BI*SS*UB	.213	5.205	.000	.130	.155	Supported
2	EE*BI*PS*UB	.378	9.023	.001	.029	.284	Supported
3	EE*BI*AN*UB	-0.341	8.013	.000	.120	.314	Not Supported
4	PE*BI*SS*UB	.472	7.930	.001	.138	.319	Supported
5	PE*BI*PS*UB	.034	5.028	.017	.001	.438	Supported
6	PE*BI*AN*UB	-.054	3.091	.000	.002	.273	Not Supported
7	SI*BI*SS*UB	.073	0.056	.007	.045	.310	Supported
8	SI*BI*PS*UB	.213	5.205	.000	.105	.130	Supported
9	SI*BI*AN*UB	-1.18	9.023	.001	.029	.284	Not Supported
10	FC*BI*SS*UB	.378	0.013	.009	.290	.314	Supported
11	FC*BI*PS*UB	.472	7.930	.001	.208	.319	Supported
12	FC*BI*AN*UB	-.213	5.205	.000	.105	.130	Not Supported
	Total R^2=.210	Delta R2= .007					

Table 5 shows the results of the bootstrap algorithm, in which all hypotheses have been assessed. The path co-efficient, T-value, P-value and limits of the hypothesis indicates that except anxiety, the entire variable and their associated interaction and mediation has significant effect on use behaviors of the learner. The anxiety may be due to the Covid-19 pressure, may be the shortages of learning support facilities and resumption (shortages of the power), but has effected the learner capacity in online mode of learning. The rest of the hypothesis and variables' result are also supported by the previous researches (Al-Ajlouni et al., 2019; Aldholay et al., 2018; Alhabeeb & Rowley 2017).

These numbers indicate that the use of information and communication technology devices provided social and psychological safety and security, in which the students continued their learning smoothly and without any disruption. But the anxiety factors remained consistently hindrance, which was due to loading shedding, non-availability of the communication signals, and abrupt change in routine, as proclaimed during the interview session. Furthermore, the value of $R^2=0.210$, which indicate the role of information and communication devices in online learning and provision of social and psychological safety and security. The facts indicate that the use of information system moderate social and psychological safety 21.0%, if it used for learning effectiveness in learning. It also means that, higher level of use of information system, the more effective will be online learning. The findings also indicate that hypothesis for the social and psychological safety have been accepted and for anxiety have not been supported, but the reasons for them were other than academics.

Focus Group Discussion Analysis
In the last, the qualitative data has been collected through focused group discussions in the institutes of south Asian region. Among various emphasized factors, the few significantly highlighted factors found in this region are financial capital and financial support, Entrepreneurial bricolage, Grievance Management system of the employees, social safety of the students, social recognition of the academic staff and the institutions, social security, technological upgradations, frustration regarding mental and physiological health dealing in the institutions and employees' rights. FGD data has been collected and coded with NVIVO tool.

Table 6: Qualitative Data

	Emphasized Factors	Relating to Quantitative Data	Type of Institution	FGD P
1	Financial Capital and Financial Support	EE and PE	Private	> 10
2	Entrepreneurial Bricolage	PE and EE	Private	> 15
3	Grievance Management	PE	Private	>20
4	System of the			

	employees			
5	Social Safety for the Students	SI	Public	> 20
6	Social recognition of the Academic staff and institutions	SI and EE	Public	> 10
7	Social Security	SI and EE	Private	> 8
8	Technological upgradations		Public	>15
9	Employees' Rights as per UN	PE	Public	>10
10	Frustration regarding mental and physiological health dealing in the institution	PE, EE	Private	>20

Table 6 reveals that the focused group discussion among thirty participants, who were from both public and private institutes discussed about various factors, from which they emphasized ten factors most significantly. These ten factors are always negligible in this region but is definitely an increasing demand with time. The factors are related to quantitative data in a way to show if a certain qualitative factor is emphasized, the quantitative data also simultaneously gets increased.

Andalib and Darun (2018) have increasingly discussed about employees' rights and related factors to disclose the real scenario that needs to be matched with the theoretical ones as soon as possible in the world context.

Case of China

China was the major first attack of the Covid-19. Being technologically advanced country, where distance education started in approximately in 1940s with postal, radio and televised programs and online and e-learning facilities are available from the last two decades, indicate in the figure 3 showing the increasing interest in online learning, besides contributing to national economy. China has already implemented IR4.0, which provided infrastructural support to all online learning process. During Covid-19, they launched two global online learning platforms, "XuetangX"(www.xuetangx.com) and "iCourse International" (www.icourse163.com), which are delivering around 3000 courses from the best universities of the world. But still anomalies were found in the online classes, especially for the technical classes, quantitative classes and music classes. The newly enrolled students were not comfortable and had reported disruption. Similarly, in the rural-urban areas, same kind of disruption has been reported (Huang et al., 2020). Some researchers have reported that the officials are not clear regarding the effectiveness of the mode of delivery and unexpected time and losses are expected to come back (Zhang et al., 2020; Huang et al., 2020). Thus, we can conclude that being technologically developed country, China also faced problems replacing physical classes. Social and psychological support must be the pre-requisite of the classes because social, psychological and emotional comfort keeps

receiving and perception active. Therefore, there is a dire need that social and psychological needs of the learner need to be fulfilled, so that they can grasp the materials with head and heart.
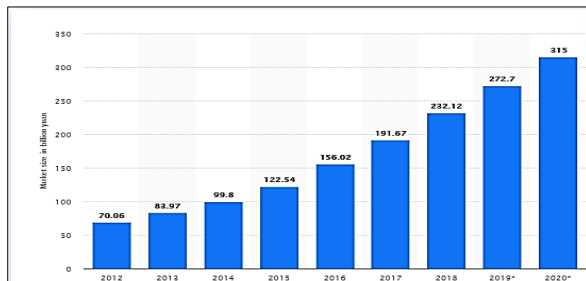

Figure 3: Source: (https://www.statista.com/statistics/739487/ china-online-education-market-size/)

CONCLUSION AND RECOMMENDATIONS

The findings of the above study concluded that information system and mobile technology has the capacity and capability for online learning. The value of R^2 indicates that the students found information system and mobile technology effective for online learning and development. Similarly, the Beta (β) was found significant for social and psychological constructs, which means that the individually also, the role of information system and mobile technology has significant role in the smooth execution of online learning, because social or physical distancing is the main requisite to remain safe in COVID-19. Furthermore, the T-value and P-value were also significant, which also support the stances taken in the hypothesis, that information system and mobile technology play their role in online learning effectiveness. Moreover, the findings of the study also contradict the previous studies results, which have the opinion that information system and mobile technology may not be having capacity and capability to provide social and psychological support to individual and

organizations (Aggestam, Durst & Persson 2014; Alalwan et al., 2016; Apostolou, 2014). This research also open horizons for the research that information system and mobile technology has to develop certain application, algorithms and sub-routines, like decision support system and expert system, which can be more effective for online learning effectiveness and development. This study also contributed to the body of knowledge and extended the theory of socio-cognitive development, organizational theory, and new institutional theory while focusing on social psychological support of the learner. Moreover, if we take the findings of the Anthoine, Moret, Regnault, Sébille, & Hardouin (2014) and Ballo & Martin (2014), the value of R2 for the social and behavioural sciences is more than 20%, it shows bigger effects as compared to the natural and biological sciences. According to this premise, the value of R2 for all our constructs is more than the limit mentioned, which means that the moderation of information system and mobile technology effect is significant, which is the main contribution of the study. This study contributed to the body of knowledge and extended to the previous studies which claims that information and communication technologies does have significant role to provide social and psychological safety and security (Alalwan et al., 2016; Al-Mamary, Shamsuddin & Aziati 2014; Agarwal & Garg 2012; Aljuaid, Alzahrani & Islam 2013). Furthermore, the study also recommends to the policy makers to implement South Asian Countries like Pakistan, Bangladesh to deploy 4.0, like china has launched 5G and implemented which will work on the infrastructure development for the 3G, 4G and in coming days for the 5G, which will not be only for teaching-learning process, but will also accelerate the economic development of the

country. More online business and operation management avenues will emerge.

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