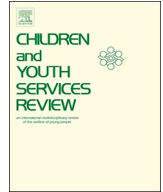




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Conventional to online education during COVID-19 pandemic: Do developed and underdeveloped nations cope alike

Atika Qazi^{a,*}, Khulla Naseer^{b,*}, Javaria Qazi^b, Hussain AlSalman^c, Usman Naseem^d, Shuiqing Yang^e, Glenn Hardaker^a, Abdu Gumaei^c

^a Centre for Lifelong Learning, Universiti Brunei Darussalam, Brunei Darussalam

^b Faculty of Biological Sciences, Quaid-i-Azam University, Islamabad, Pakistan

^c Department of Computer Science, College of Computer and Information Sciences, King Saud University, Riyadh 11543, Saudi Arabia

^d School of Computer Science, University of Sydney, Australia

^e School of Information Management and Engineering, Zhejiang University of Finance and Economics, China

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ABSTRACT

Background: Educational institutes around the globe are facing challenges of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Online learning is being carried out to avoid face to face contact in emergency scenarios such as coronavirus infectious disease 2019 (COVID-19) pandemic. Students need to adapt to new roles of learning through information technology to succeed in academics amid COVID-19.

Objective: However, access and use of online learning resources and its link with satisfaction of students amid COVID-19 are critical to explore. Therefore, in this paper, we aimed to assess and compare the access & use of online learning of Bruneians and Pakistanis amid enforced lockdown using a five-items satisfaction scale underlying existing literature.

Method: For this, a cross-sectional study was done in the first half of June 2020 after the pandemic situation among 320 students' across Pakistan and Brunei with a pre-defined questionnaire. Data were analyzed with statistical software package for social sciences (SPSS) 2.0.

Results: The finding showed that there is a relationship between students' satisfaction and access & use of online learning. Outcomes of the survey suggest that Bruneian are more satisfied (50%) with the use of online learning amid lockdown as compared to Pakistanis (35.9%). Living in the Urban area as compared to a rural area is also a major factor contributing to satisfaction with the access and use of online learning for both Bruneian and Pakistanis. Moreover, previous experience with the use of online learning is observed prevalent among Bruneians ($P = .000$), while among friends and family is using online learning ($P = .000$) were encouraging factors contributed to satisfaction with the use of online learning among Pakistanis amid COVID-19. Correlation results suggest that access and use factors of online learning amid COVID-19 were positively associated with satisfaction among both populations amid COVID-19 pandemic. However, Bruneian is more satisfied with internet access ($r = 0.437, P < .000$) and affordability of gadgets ($r = 0.577, P < .000$) as compare to Pakistanis ($r = 0.176, P < .050$) and ($r = 0.152, P < .050$).

Conclusion: The study suggested that it is crucial for the government and other policymakers worldwide to address access and use of online learning resources of their populace amid pandemic.

1. Introduction

COVID-19 first appeared in Wuhan, China in December 2019. The infection was declared 'pandemic' by World Health Organization (WHO) on 11 March 2020 (Cucinotta, 2020). Most of the governments around the world have initiated a common goal to curb the spread of this highly contagious disease by imposing lockdown, social/physical

distancing, avoiding face-to-face teaching-learning, and restrictions on immigration (Gonzalez et al. 2020). Pakistan reported the first COVID-19 case from Karachi and currently, the country is facing a COVID-19 spike. Government of Pakistan has initiated many strategies to contain the viral transmission, and educational institutions across the country have been shut down as preliminary prevention step. This closure has led to an unprecedented impact on students, as they are being urged to

* Corresponding authors.

E-mail addresses: atikaqazium@gmail.com (A. Qazi), khullanaseer03@gmail.com (K. Naseer).

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switch from conventional teaching to online learning sources (Abidah, 2020; Vaishya, 2020). COVID-19 outbreak has led to a digital revolution in education via use of online lectures, digital books, teleconferences, and virtual classrooms (Kapasia, 2020; Sutton and Jorge, 2020; Strielkowski).

However, it is believed that online learning emerges to be discriminatory against poor students, who cannot afford the necessary gadgets and devices for online education. In the underdeveloped and developing nations, many students cannot afford a reliable internet connection or the necessary gadgets needed for online connectivity and therefore are marginalized. COVID-19 lockdown has significantly hampered the teaching–learning process by the use of online modules. It is imperative to thoroughly understand the teaching–learning process, to take the necessary steps to smoothly run the two-way process (Kapasia, 2020). This study, therefore, aims to identify learning status, learning modules, and issues that are being faced by the students during the pandemic.

The use of technology is important because it is often found to be positively correlated with satisfaction (Qazi, 2017). To the best of our knowledge, this is the very first study which assesses the student satisfaction with the use of online learning resources amid COVID-19; using well-established literature for the development of satisfaction scale.

2. Method

2.1. Data collection and procedure

A cross-sectional study was done in the first half of June 2020 after the pandemic situation among 330 students' across Pakistan and Brunei using a pre-defined questionnaire. A structural questionnaire link using 'Google form' was sent to students' through WhatsApp and Facebook groups.

2.2. Data analysis

Data was analyzed using SPSS 2.0. Both (1) descriptive statistics and inferential statistics were carried out to understand the distribution of study participants and impact of preparedness on satisfaction with online learning during the COVID-19 pandemic.

Univariate and multivariate logistic regression analyses were used. The sample characteristic and satisfaction level amid COVID-19 was explored using univariate analysis, while multivariate logistic regression was performed to estimate the strengths of associations demonstrated by the odds ratio (OR) with a 95% confidence interval (CI). Spearman's correlation coefficient, r , was used (Hauke and Kossowski, 2011) to evaluate the association between preparedness and satisfaction with online learning resources amid COVID-19. The p -value $p < 0.05$ was considered statistically significant.

2.3. Instrument design

Questionnaire is based on introduction, demographics and closed ended questions. The questions for this survey were adopted from published studies during influenza H1N1/A, and pandemic COVID-19 (Kapasia, 2020; Qazi, 2020; Chick, 2020; Bao, 2020).

The participants responded to the 5-items of satisfaction with the use of online learning amid COVID-19. The measurement of satisfaction is commonly done through either an aggregate (single-item) or attribute (multi-item) level of measurement (Szymanski and Henard, 2001). The satisfaction items were developed under published literature from COVID-19 pandemic, related literature on satisfaction, and some items are taken from a well-established student satisfaction scale (Kapasia, 2020; Qazi, 2017; Huebner, 1991; Elliott and Shin, 2002). Using the online learning makes me feel satisfied, I'm satisfied with educational progression, I'm satisfied with the course content delivered by the

Table 1

Students with different satisfaction level (n = 330).

Satisfaction Level	Brunei (n = 130)		Pakistan (n = 200)	
	F	%	F	%
Low	21	16.2	71	35.5
Moderate low	36	27.7	58	29.0
Moderate high	32	24.6	36	18.4
High	41	31.5	35	17.5

teacher using online mode, I think I can complete the syllabus amid COVID-19 pandemic, I feel the policy of online learning to avoid COVID-19 is a good move, I like the way things are going for me. Respondents were asked to rate ranging from 0 (low) to 3 (high) on Likert scale. The demographic section 1 of the survey included scores yes (1) and no (0) responses.

2.4. Ethical consideration

All participants voluntarily gave consent for participation in the survey. Since participants were kept anonymous, no formal ethical approval was needed.

3. Results

3.1. Satisfaction level among student' amid COVID-19 pandemic

Table 1 shows how the satisfaction level of students was affected to varying degrees amid COVID-19. Of the 320 students, more than 15% of Bruneians have low or moderately low satisfaction, whereas more than 30% of Pakistanis were less satisfied with online learning. The signs of moderate-high to high level of satisfaction were more prevalent among Bruneian (24.6%&31.5%) as compared to Pakistanis (18.4% &17.5%). This result shows that people belonging to economically unstable nations are more unsatisfied with the online leaning strategy amid COVID-19. Fig. 1(a, b, c) presents the demographic characteristics of the respondents. It can be seen that over 70% of the respondents were satisfied with the use of an online learning system from Brunei and less than 50% were satisfied with online learning in Pakistan. When asked about the mode of online classes during lockdown the results were insignificant for both Brunei and Pakistan.

3.2. Factors influencing students' satisfaction amid COVID-19 pandemic

3.2.1. Univariate analysis

Table 2 presents relationship between demographic characteristics and satisfaction among Bruneians and Pakistanis. Gender was not significantly linked with satisfaction among both Bruneians ($P = .133$) and Pakistanis ($P = .431$). Moreover, education level also was neither linked significantly with Bruneians ($P = .966$) nor with Pakistanis ($P = .986$). The mode of learning was also insignificant for Bruneians ($P = 0.053$) and Pakistanis ($P = 0.624$). However, residence status was significantly linked with the satisfaction of students in both countries e.g. Bruneian (0.044) and Pakistanis (0.037).

Satisfaction was significantly associated with the fact that students were used to attend online lectures before COVID-19 outbreak in Bruneian ($P = .000$) and Pakistanis ($P = .000$). Like-wise use of online learning modeules by friends and family was also linked significantly with satisfaction among Bruneians ($P = .000$) and Pakistanis ($P = .000$). The mode of learning was insignificantly related to satisfaction for Bruneian and Pakistanis.

4. Ordinal regression analysis

Table 3 summarizes results of ordinal multivariate analysis of

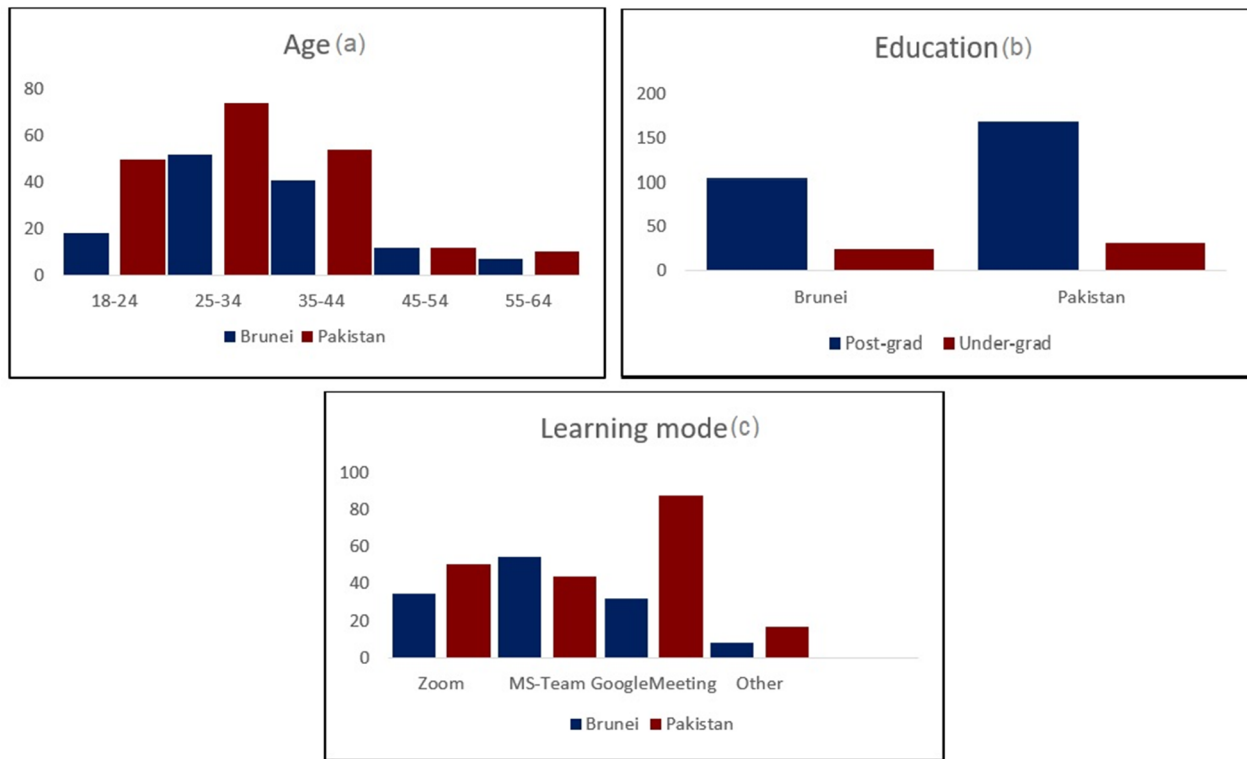


Fig. 1. Demographic of respondents.

studied factors with satisfaction. Significance factors from univariate analysis were included in the ordered logistic regression analysis. In model test, $p < .05$, indicated that OR value of at least one variable was statistically significant.

Results show that urban residents were more satisfied with online learning as compared to rural resident for both Brunei (OR = 3.201, 95% CI = 1.358, 7.457) and Pakistan (OR = 2.094, 95% CI = 1.014, 4.324). Use of online learning before COVID-19 (OR = 0.344, 95%

Table 2
Univariate analysis of factors affecting satisfaction among Bruneians and Pakistanis amid COVID-19 pandemic.

Country	Variable		Satisfaction Level				Statistics	P
			Low	Mild	Moderate	High		
Brunei	Gender	Female	26(36.1)	23(31.9)	15(20.8)	8(11.1)	5.6023 ^a	0.133
		Male	25(25.9)	13(22.4)	17(29.3)	13(22.4)		
Pakistan	Gender	Female	22(20.8)	36(34.0)	27(25.5)	21(19.8)	2.758 ^b	0.431
		Male	14(14.9)	35(37.2)	31(33.0)	14(14.9)		
Brunei	Learning Mode	Zoom	19(34.5)	15(27.3)	14(25.5)	7(12.7)	14.415 ^a	0.053
		MS-Team	7(21.9)	12(37.5)	6(18.8)	7(21.9)		
		Google meeting	12(34.3)	7(20.0)	10(28.6)	6(17.1)		
		Other	3(37.5)	2(25.0)	2(25.0)	7(12.5)		
Pakistan	Learning Mode	Zoom	10(19.6)	13(25.5)	18(35.3)	10(19.6)	7.126 ^b	0.624
		MS-Team	8(18.2)	15(34.1)	13(29.5)	8(18.2)		
		Google meeting	17(19.3)	34(38.6)	24(27.3)	13(14.8)		
		Other	1(5.9)	9(52.9)	3(17.6)	4(23.5)		
Brunei	Education Level	Postgrad	34(32.4)	29(27.6)	25(23.8)	17(16.2)	.268 ^a	0.966
		Undergrad	7(28.0)	7(28.0)	7(28.0)	4(16.0)		
Pakistan	Education Level	Postgrad	31(18.3)	60(5.5)	49(9.0)	29(7.2)	.143 ^b	0.986
		Undergrad	5 (16.1)	11(35.5)	9(29.0)	6(19.4)		
Brunei	Residence Status	Urban	24(30.4)	24(30.4)	14(17.7)	17(21.5)	8.087 ^a	0.044
		Rural	17(33.3)	12(23.5)	18(35.3)	4(7.8)		
Pakistan	Residence Status	Urban	5(7.40)	26(38.20)	22(32.40)	15(22.10)	8.465 ^b	0.037
		Rural						
Brunei	Used to online learning before the outbreak of COVID-19	Yes	12(12.2)	26(26.5)	21(21.4)	39(39.8)	50.36 ^a	0.000
		No	2(6.3)	24(75.0)	6(18.8)	0(0.0)		
Pakistan	Used to online learning before the outbreak of COVID-19	Yes	35(24.6)	23(16.2)	49(34.5)	35(24.6)	82.83 ^b	0.000
		No	1(1.7)	48(82.8)	9(15.5)	0(0.0)		
Brunei	My friends are using online learning to avoid COVID-19	Yes	39(50.0)	14(17.9)	9(11.5)	16(20.5)	43.59 ^a	0.000
		No	2(3.8)	22(42.3)	23(44.2)	5(9.6)		
		Yes	36(31.0)	34(29.3)	18(15.5)	28(24.1)		
		No	0(0.0)	37(44.0)	40(47.6)	7(8.3)		
Pakistan	My friends are using online learning to avoid COVID-19	Yes					53.31 ^b	0.000
		No						

Table 3

Ordinal logistic regression analysis of factors influencing satisfaction with online learning among Bruneians and Pakistanis amid COVID-19 pandemic.

Country	Factors		Number	SE	OR	P	OR (95%CI)
Brunei	My friends &relatives are using online learning to avoid COVID-19	Yes	100	0.405	3.349	0.003	(1.513, 7.414)
		No ^a	30	–	–	–	–
Pakistan		Yes	134	0.198	1.937	0.029	(1.070, 3.507)
		No ^a	66	–	–	–	–
Brunei	Used to online learning before the outbreak of COVID-19	Yes	72	0.388	0.344	0.006	(0.161, 1.049)
		No ^a	58	–	–	–	–
Pakistan		Yes	62	0.293	2.270	0.005	(1.276, 4.038)
		No ^a	138	–	–	–	–
Brunei	Residence status	Urban	92	0.437	3.201	0.008	(1.358, 7.457)
		Rural	38	–	–	–	–
Pakistan		Urban	117	0.370	2.094	0.046	(1.014,4.324)
		Rural	83	–	–	–	–

SE Std. Error, OR Odds ratio, CI Confidence interval.

a: reference group.

CI = 0.161, 1.049) (OR = 2.270, 95% CI = 1.276, 4.038), and friends and family are using online learning during COVID-19 (OR = 3.349, 95% CI = 1.513, 7.414) (OR = 1.937, 95% CI = 1.070, 3.507) were protective factors for both Bruneian and Pakistanis respectively.

5. Correlation analysis between use of online learning resources and students satisfaction amid COVID-19 pandemic

Table 4 shows correlation analysis between access and use factors of online learning and satisfaction amid COVID-19 among Bruneians and Pakistanis. All evaluated access & use factors are significantly linked with online learning satisfaction among Bruneians and Pakistanis. Correlation analysis shows that Bruneians are more satisfied with reliable internet support ($r = 0.437, P < .001$) and affordability of gadgets ($r = 0.577, P < .001$). Moreover, I can use online learning resources to save my academic year while practicing social distancing amid COVID-19 ($r = 0.481, P < .001$) and I have access to online learning resources during COVID-19 ($r = 0.485, P < .001$) is significant at < 0.001 for Bruneians.

On the other hand, Pakistanis are less satisfied with reliable internet support ($r = 0.176, P < .050$) and affordability of gadgets ($r = 0.152, P < .050$). Subsequently, I can use online learning resources to save my academic year while practicing social distancing amid COVID-19 ($r = 0.447, P < .001$) and I have access to online learning resources during COVID ($r = 0.436, P < .001$) were also moderately satisfied for Pakistanis as compare to Bruneians. Therefore, it can be summarized that Bruneians are more satisfied with the internet access, affordability of gadgets, use of learning resources, and access to learning resources amid COVID-19 pandemic lockdown; whereas Pakistanis are less or moderately satisfied with the accessibility and affordability to

Table 4

Correlation analysis of social functionality disorder factors influencing public anxiety.

Country	Related factors	Satisfaction Level	
		R	P
Brunei	I have reliable Internet support	0.437**	< 0.001
	The online class attended gadgets are-affordable to me	0.577**	< 0.001
	I can use online learning resources to save my academic year while practicing social distancing amid COVID-19	0.481**	< 0.001
	I have access to online learning resources during COVID	0.485**	< 0.001
Pakistan	I have reliable Internet support	0.176**	< 0.050
	The online class attended gadgets are-affordable to me	0.152**	< 0.050
	I can use online learning resources to save my academic year while practicing social distancing amid COVID-19	0.447**	< 0.001
	I have access to online learning resources during COVID	0.436**	< 0.001

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

r Correlation coefficient.

the Internet and gadgets.

6. Discussion

Outcomes of the study shows that use and access of online learning resources during novel COVID-19 pandemic is crucial for student satisfaction (Kapasia, 2020; Chick, 2020; Bao, 2020). It suggests that these innovative solutions utilizing technology may help to bridge the educational gap. Results suggest that 17.5% of Pakistanis and 31.5% Bruneians have high satisfaction with access and use of online learning amid COVID-19 pandemic. This is because Bruneians have more access to technology and are used to online teaching modules. Brunei has the second-highest Human Development Index among Southeast Asian nations whereas Pakistan is a developing nation (Akhtar, 2015; Porter, 1965).

The main aim of the study was to assess the effect of access & use of online learning resources on student satisfaction. Outcomes suggest that level of access and use are linked with student satisfaction in both Pakistan and Brunei. Student satisfaction is also linked to residence location, previous online learning experience, use of online learning resources by a friend or family. However, it is noted that there is no effect of gender and education level on the satisfaction of the student (Witowski, 2008; Palmer and Holt, 2009). Results of multivariate logistic regression suggest that students living in urban localities are more satisfied with online learning as compared to students of the rural areas for both nations. This is because urban localities have better access to reliable internet connectivity resources (Kim and Lee, 2011; Irons et al., 2002).

The previously experienced students are more satisfied with online learning modules for both Brunei and Pakistan. However, a comparison

shows that satisfaction was higher among Bruneian at (39.8%) as compared to Pakistanis (24.6%). This is because Bruneian students are used to practicing online learning in comparison with Pakistanis. These outcomes are in line with previous studies which indicates that previously experienced online learners are more satisfied with the ongoing education system amid COVID-19 lockdown (Rajak, 2018; Seyal and Rahman, 2015).

Another interesting aspect is the use of online learning mode by friends and family, which provides a motivation and increases satisfaction among students in both countries. However, comparative analysis shows that Pakistanis (24.1%) are more satisfied as compared to Bruneians (20.5%). Therefore, it can be summarized that Bruneians are more satisfied with the internet access, affordability of gadgets, use of learning resources, and access to learning resources amid COVID-19 pandemic lockdown; whereas Pakistanis are less or moderately satisfied with the accessibility and affordability to the Internet and gadgets.

Outcomes are consistent with the proposed hypothesis, which states that access and use of online learning factors depend on the reliable internet support, support gadgets for attending online classes, use online learning resources to save my academic year while practicing social distancing amid COVID-19; access to online learning resources during COVID-19 was positively associated with satisfaction among both Bruneian and Pakistanis students' amid COVID-19.

Many studies have reported that closure of educational institutes due to the COVID-19 lockdown will have a significant impact on the education that demands online learning (Bao, 2020). Moreover, the privileged students who have better access to online learning can perform better which ultimately leads to enhanced satisfaction (Jena, 2020; Biswas). Data analysis clearly shows that Bruneians are more satisfied with the use of the internet ($r = 0.437, P < .001$) in comparison to Pakistanis. Besides affordability is also a prominent factor that contributes to satisfaction among Bruneians. This is because Bruneians belong to established economies while Pakistanis face considerable economic constraints (Bhaskaran, 2010). Moreover, for access and use, online learning is correlated for both Bruneian and Pakistani students'. The students which have better access to online learning tools, are well adapted to their use and therefore more satisfied with online education as compared to underprivileged students who don't have access to online learning tools.

Limitations of the study include facts that study outcomes cannot be generalized. This is because outcomes are limited to a handful of responses from both nations. Therefore, a larger study involving more participants is needed to generalize the research findings. The study has, however, looked into substantial factors concerning access and use of online learning resources which impact students of developing and developed countries amid pandemic. However, other possible factors like lack of entertainment, cultural, and social services can also be evaluated in conjunction with satisfaction.

However, students' satisfaction is affected during the lockdown in both regions due to bans on gathering, events, travel, shutting down the educational institutes disturbing routine life (Sohrabi, 2020; Chinazzi, 2020; Chen, 2020). In general terms, countries with a strong economy can better cope with the emergency and provide robust attention to less privileged areas that are necessary during public health emergencies.

7. Implications & future recommendations

The COVID-19 lockdown has made significant disruptions in academic activities globally. In this study, we aimed to assess the satisfaction status of Pakistani and Bruneian students with online learning during this pandemic. Although a substantial proportion of students are using digital platforms for learning, many of them are not satisfied due to several challenges related with access and use of online study. We therefore, suggest following recommendation to the government, policymakers, and institutional authorities.

There should be made a uniform academic plan for the universities

and colleges to continue the learning process during an emergency. The infrastructural facilities should be available to all educational institutions for regulation of digital learning process during future health emergencies. Adequate funding needs to be ensured to improve the education system and provide training to stakeholders. A targeted intervention strategy is needed to develop positive study space for students belonging to the vulnerable section of society.

In this critical public health crisis, open-source digital learning strategies should be adopted by teachers for conducting online classes. It is need of the hour to develop multi-prolonged strategies to build resilient education system, which can ensure skill development for the productivity of the young minds. To increase socioeconomic status for access and use, students would be helped with scholarships because socioeconomic status is an effective variable predicting life satisfaction.

8. Conclusion

Since, emergence of COVID-19 in late December 2019, educational activities around the globe have been hampered significantly. Most of the educational institutes globally have shifted from conventional to online learning. In this study we aimed to assess the satisfaction of students with online learning along with parameters that affect satisfaction level. Outcomes revealed that there is a relationship between students' satisfaction and access & use of online learning. It is concluded that Bruneian are more satisfied with online learning as compared to Pakistanis. Living in urban area is also a major factor contributing to satisfaction. Moreover, previous experience with use of online learning is prevalent among Bruneians, use of online resources by friends and family is another factor contributing to satisfaction with online learning among Pakistani students amid COVID-19. Correlation analysis suggest access and use of online learning amid COVID-19 were positively associated with satisfaction among both populations. However, Bruneians are more satisfied with internet access and affordability of gadgets as compared to Pakistanis. This shows that students of nations with lower socio-economic status need more attention and support. Therefore, high-end programs that cater to the educational requirements of the students belonging to low-income countries need to be devised to overcome access and use difficulties. Online education has come in to save academic year of many pupils and educational institutes globally should implement an online learning programme into their systems to deal with unprecedented situations.

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.

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Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.childyouth.2020.105582>.

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