Original Article

Perception of a Public-Sector Dental Institute Students towards the use of Google Classroom

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ABSTRACT

Objective: The aim of this study was to assess the perception in terms of attitude and practice of students of a public sector dental institute towards the use of Google Classroom during the COVID lockdown.

Materials and Methods: This online, cross-sectional study was conducted at Sindh institute of oral health sciences (SIOHS) between the periods from 15 January 2021 to 14 April 2021. A questionnaire consisting of 16 items was administered online to observe the perceptions of undergraduate dental students at SIOHS, about Google® classroom. All students enrolled in the undergraduate dentistry program were considered the study population and data was collected after an informed consent. The data was analyzed using SPSS version-21.

Results: In this study with a response rate of 74%, the results showed that 54.1% of the students agreed that Google® Classroom can be considered a modern e-learning tool, and 53.4% of the students considered Google® Classroom as a user-friendly educational platform. Around 56.8% of the students did not struggle to make assignments on Google Classroom. About 46.6% of the students found that watching clinical videos did not improve their clinical skills.

Conclusion: This study concludes that undergraduate dental students considered Google® Classroom as a user-friendly, helpful, and modern E-learning tool for academic purposes and preparation for their assessments during the COVID lockdown.

Keywords: COVID-19, E-learning, Google classroom, Health education

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INTRODUCTION

The Coronavirus disease (COVID-19) has caused worldwide public health emergencies and lockdowns. To control the spread of infection and effectively deal with the situation, the Government of Pakistan declared a lockdown to limit daily outdoor activities and interaction with people. The lockdown also affected all educational organizations including dental colleges. Therefore, most of the educational institutes had been shut down as a preventative action towards controlling the spread of this disease. The lockdown situation required alternate policies for the continuation of education. The E-learning approach has been recommended by UNICEF for the continuation and propagation of education, specifically in such circumstances.[1]

There are many online education platforms that helped to continue academic activities and strived to achieve student engagement so that the students could remain at par with their educational requirements These platforms include Blackboard Learn®, We Video®, Feedback Fruits®, Seesaw®, Shift®, Docebo®, Adobe®, Class time®, Zoom®, Google Classroom®, Future Learn, Flip and many more.[2, 3] Similar to global practices, universities in Pakistan instructed their constituent and affiliated medical and dental colleges to initiate online classes to prevent any lapse in the educational process while the students were required to stay at home.[4]

Google® Classroom (GCR) is an open-source web service provided for training and education with the solitary aim of online assessment of tests and projects in a paperless way. To avail of this service, administrations must enroll their corporate account on G-Suit. Students must have a valid email account to get linked to the class. This is linked to Google® Docs, Google® Drive, and Gmail® for effective sharing of resource.[5,6]

Google® Classroom is now emerging as an effective, productive, and engaging tool for all educationists, instructors, and students. It has several unique features that help the academic processes in a variety of ways including teaching, assessment, and feedback.[7] However, in spite of its various advantages there are a few limitations of E-learning platforms including Google® Classroom such as lack of training faculty and support, dependency on student's access to computer/internet, poor internet connection, inadequate information and awareness of ICT (Information and communications technology) usage. For instance, the accessibility of content like video and other applications is still new to many teachers in developed nations, even at the university level.[8]

E-learning is now gaining popularity in Pakistan in order to avoid the loss of education due to the COVID-19 lockdown.[9] As this is a novel method introduced in Pakistan, teachers and students both were unfamiliar with this platform.[10] Even though studies have been conducted locally regarding the perception of medical and dental students for E-learning during the COVID-19 pandemic, no study has significantly identified dental students' perception regarding the use of Google® Classroom.

The purpose of this study was to assess the perception of students enrolled in a dental college, affiliated with a public sector university, regarding the benefits and drawbacks of academic activities conducted through Google® Classroom. The results of this study will help to understand the utility of this E-learning platform and the difficulties that have been faced by the students while continuing their education activities through Google Classroom®. If found effective, then recommendations to include the Google® Classroom as a regular feature in the academic plan for dental students can be made. In case any deficiencies are observed, then guidelines can be sought out and/or formulated to ensure that the faculty and students can maximize the educational benefit of this interface.

MATERIALS AND METHODS

After approval of the protocol by the Ethical Review Committee (JSMU/IRB/2021/-451) of Jinnah Sindh Medical University, Karachi, this study was conducted between the periods from 15th January 2021 to 14th April 2021, at the setting of Sindh Institute of Oral Health Sciences (SIOHS) among the all undergraduate dental students enrolled in the BDS program. This was a cross-sectional study design where the data was collected online. The data collection instrument was the online questionnaire with items assessing the perception towards Google® Classroom during lockdown among dental students of SIOHS. The questionnaire was developed by formulating items after an extensive literature

search of relevant publications.[7] Relevant items were developed for the questionnaire and opinion was sought from two medical education experts in order to determine the validity of the content. A pilot study was also conducted on 12 students, to determine the ease of understanding the items and the language of the questionnaire. In light of the feedback received from these students, the items were modified and the final version of the questionnaire was formulated. The questionnaire was made on Google® Form and consisted of three parts. The first section of the questionnaire was used to collect the socio-demographic details of the students. The second section was based on six close-ended items related to the attitude towards online lectures. The third section consisted of ten items based on a 3-point Likert scale, related to the practice of students towards online learning.

Around 200 undergraduate dental students currently studying in SIOHS were considered the study population. The questionnaire with a brief description of the research and the option for giving consent to participate in the study will be developed on Google® Forms. The link to the questionnaire was shared with the students using the social media app WhatsApp and then data was collected and analyzed. The sample size was selected using Open Epi 3.01 software for epidemiologic statistics. Students not taking the online classes or who did not provide consent to become part of this study were excluded from the survey.

Data were analyzed using Statistical Package for the Social Sciences (SPSS) software program version 21.0 (IBM, Armonk, New York). Descriptive data included frequency (n) and percentages (%). The chi-squarest was used to compare the difference between the perception of dental students of pre-clinical and clinical classes, and statistical significance was set at a $p \leq 0.05$. Data were entered via a private computer with password protection and could be accessed only by the principal investigator.

RESULTS

A total of 148 students out of 200 responded to the questionnaire, giving a response rate of 74%. Out of the total respondents, 41(27.7%) were male and 107(72.3%) were female. Students were divided into two age groups, 18-20

years (60.1%) and 21-23years (39.8%). The distribution according to the year of study is shown in Figure 1, with the highest number of responses from the 3rd year BDS students.
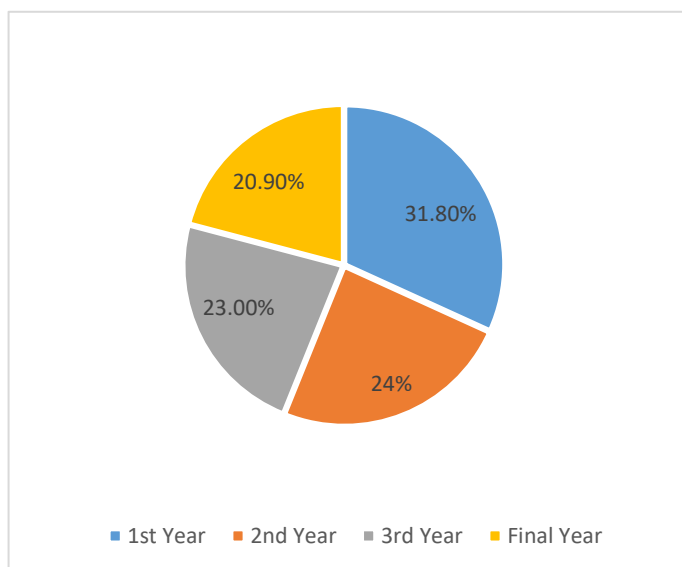

Figure 1: Distribution of students according to year of study

It was found that a total of 145 students attended online lectures during a lockdown. When queried about Google® Classroom, the majority of the students 80 (54.1%) considered GCR as a new E-learning platform. Around 79(53.4%) students expressed that knowledge was not retained from GCR as well as compared to conventional lectures. A total of 58 (39.2%) students were of the opinion that Google® Classroom provides complete coverage of the topic, 48 (32.4%) students were undecided while 41(27.7%) students disagreed regarding the complete coverage of the topic by GCR. Around 79 (53.4%) students considered as a user-friendly educational platform. A total of 59 students (39.9%) found Google® Classroom helpful for the preparation of exams while some of the students (n=54, 36.5%) had the opposite view, reporting that it did not assist them in their exam preparations. In relation to the academic year, the attitudes of students regarding the use of Google Classroom were found to be statistically significant (p < 0.05), Table 1.

Table 1: Attitude towards Google® classroom responses according to the year of study

Questions	First Year n (%)	Second year n (%)	Third year n (%)	Final year n (%)	p-value
Google Classroom can be considered applicable as a new e-learning tool.					
Agree	34(72.3%)	19(52.8%)	17(50.0%)	10(32.3%)	
Disagree	2(4.3%)	6(16.7%)	9(26.5%)	5(16.1%)	0.006*
Neutral	11(23.4%)	11(30.6%)	8(23.5%)	16(51.6%)	
Lectures through Google classroom conducted in lockdown conveyed the complete coverage of a particular topic.					
Agree	28(59.6%)	18(50.0%)	7(20.5%)	6(19.4%)	
Disagree	4(8.5%)	3(8.3%)	15(44.1%)	19(61.3%)	0.001
Neutral	15(31.9%)	15(41.7%)	12(35.%)	6(19.4%)	
Web-based assignments are user-friendly.					
Agree	34(72.3%)	22(61.1%)	13(38.2%)	10(32.3%)	
Disagree	5(10.6%)	0(0.0%)	15(44.1%)	5(16.1%)	0.001
Neutral	8(17.0%)	14(38.9%)	6(17.6%)	16(51.6%)	
Google Classroom helped me prepare for my exams.					
Agree	26(55.3%)	21(58.3%)	9(26.5%)	3(9.7%)	
Disagree	7(14.9%)	9(25.0%)	16(47.1%)	22(71.0%)	0.001
Neutral	14(29.8%)	6(16.7%)	9(26.5%)	6(19.4%)	

About 46% of the students responded that more often their queries about a specific topic were discussed by the faculty in the GCR while about 49% of the students stated that they only received feedback from the faculty sometimes regarding their submitted assignments. A total of 83(56.1%) students found Google® Classroom as an effective tool for studying and 63 (42.6%) students affirmed that it should be a part of their regular study strategy. A total of 68 students (46.6%), especially from the fourth year, found that watching clinical videos did not improve their clinical skills. Regarding the assignment submission on GCR, 65 (44.5%) students confirmed a positive experience while only a very few rated it as unsatisfactory (n=7, 4.8%). The majority of the students 108 (73.0%) completed their assignments within a stipulated time. Around 56.8% of the students did not find any difficulty in making assignments on GCR. A large number of the students (80.4%) had faced internet connectivity issues or other technical problems during online lectures, whereas 16.2% reported not facing such hindrances The resources utilized by the majority of the students for completion of online assignments were textbooks 113(76.4%), followed by Internet search 32 (21.6%) and slide share 3 (2.0%). The practices of students regarding the use of GCR year-wise were found to be statistically significant (p < 0.05), Table 2.

Table 2: Practice of Google® classroom classes during lockdown period

Questions	First Year n (%)	Second year n (%)	Third year n (%)	Final year n (%)	p-value
I found Google Classroom as an effective tool for studying					
Yes	35(74.5%)	26(72.2%)	12(35.3%)	10(32.3%)	
No	5(10.6%)	9(25.50%)	10(29.4%)	14(45.2%)	0.001
Not sure	7(14.9%)	1(2.8%)	12(35.3%)	7(22.6%)	
Watching clinical videos on google classroom in lockdown period improved my clinical skills					
Yes	10(22.2%)	3(8.3%)	9(26.5%)	1(3.2%)	
No	16(35.6%)	14(38.9%)	18(52.9%)	20(64.5%)	0.008
Not sure	19(42.2%)	19(52.8%)	7(20.6%)	10(32.3%)	
Google Classroom should be a part of my regular study strategy					
Yes	27(57.4%)	15(41.7%)	14(41.2%)	7(22.6%)	
No	4(8.5%)	7(19.5%)	15(44.1%)	16(51.6%0	0.001
Not sure	16(34.0%)	14(38.9%)	5(14.7%)	8(25.8%)	
Rate your experience in the completeness of assignments and submissions on google classroom					
Excellent	17(36.2%)	4(11.1%)	11(34.4%)	1(3.2%)	0.001
Good	22(46.8%)	22(61.1%)	7(21.9%)	14(45.2%)	
Average	8(17.0%)	8(22.2%)	11(34.4%)	14(45.2%)	
Not Satisfactory	0(0%)	2(5.6%)	3(9.4%)	2(6.5%)	
Did you Complete your Google Classroom assignments within the stipulated period?					
Almost every time	43(91.5%)	24(66.7%)	23(67.6%)	18(58.1%)	
Sometime	4(8.5%)	10(27.8%)	7(20.6%)	12(38.7%)	0.007
Never	0(0%)	2(5.6%)	4(11.8%)	1(3.2%)	
Did you receive timely feedback from the faculty regarding your assignments?					
Every time	26(55.3%)	23(63.9%)	15(44.1%)	3(9.7%)	
Sometime	21(44.7%)	13(36.1%)	14(41.2%)	24(77.4%)	0.001
Never	0(0%)	0(0%)	5(14.7%)	4(12.9%)	
Did you face any problems in attending online classes due to interruption in internet connectivity or other technical difficulties?					
Yes	30(63.8)	29(80.6%)	31(91.2%)	29(93.5%)	
No	14(29.8%)	7(19.4%)	1(2.9%)	2(6.5%)	0.006
Not sure	3(6.4%)	0(0%)	2(5.9%)	0(0%)	
It is a good forum for discussing my queries with the faculty online					
Often yes	24(51.1%)	21(58.3%)	14(41.2%)	9(29.0%)	
Always yes	8(17.0%)	2(5.6%)	6(17.6%)	1(3.2%)	
Not sure	7(14.9%)	12(33.3%)	6(17.6%)	9(29.0%)	0.004
Often no	8(17.0%)	1(2.8%)	8(23.5%)	12(38.7%)	

DISCUSSION

The COVID-19 lockdown forced all educational institutes around the globe to continue educational activities through online teaching forums.[11] The current study conducted in SIOHS about the perception of E-learning among dental undergraduate students, highlights the importance of Google® Classroom and the possible problems associated with its usage. It accentuates the responses the students received after attending such classes. Their perception of the knowledge, usage of Google Classroom, and realizing its necessity during lockdown were assessed in this survey.

In Pakistan, the trend of online education was not prevalent before the advent of COVID-19. However, after the international lockdown and cessation of all regular academic activities, educational centers all over the country were left with no choice but to acquaint themselves with different online learning forums and modalities.[12] This study was important to recognize the difficulties faced by undergraduate dental students due to the abrupt change in the method of learning.

The result of the current study indicates that the majority of the responders were female which is similar to results reported in other studies.[13,14] This reveals the worldwide increasing trend of females opting for professional occupations including dentistry, as compared to males. The majority of students who responded to the questionnaire had attended online classes but the results showed that they were not familiar with Google Classroom and considered it a new teaching modality. Google Classroom has been available for commercial use since 2014, but this and other similar online learning platforms had not been explored by both faculty and students before the advent of the COVID-19 pandemic.[15] The ensuing lockdown has forced the modification of teaching practices globally, and therefore our institute also shifted its academic activities to online modalities including Google Classroom. With constant use and access to this platform, the students have become familiar with its various advantageous features.[16] Majority of the students found Google Classroom user-friendly as it can be easily accessed by gadgets such as computers, mobile, laptops, and notepads. It is convenient, easy to operate, hassle-free, and saves money, time, and paper as compared to traditional methods of teaching.[17]

Paperless methods have been shown to be more practical and useful in developing learning strategies. This way, the students can keep their files and documents more organized.[18] Students found Google Classroom helpful for the preparation of examinations as it improves their vocabulary. This would prove effective for their preparation for exams since all medical and dental studies in Pakistan are currently being conducted in the English language. They can also easily access their syllabus and course at any time for revision as required, since the academic material can be uploaded and saved on this platform.[19]

Despite of these advantages, several studies have shown that students prefer face to face learning rather than E-learning due to the perceived lack of interaction in online teaching.[9] A lot of students were of the opinion that the educational content delivered through the Google Classroom was not recollected as clearly or completely as that which they received during physical didactic sessions. This concern was majorly raised by the students of clinical years, and the reason could be the lack of physical demonstration and hands-on practice of the procedures that they were being taught theoretically. Since there was no reinforcement of their cognitive learning through psychomotor sessions, their retention of relevant content may be affected.[20] Similarly, even though the majority of the students believed Google Classroom enabled the coverage of a vast amount of the curriculum, many 3rd and final-year students were unsure if this was indeed the case. This could be because a large component of the curriculum in 3rd and final year is based on clinical procedures, which could not be demonstrated and practiced because of the lockdown.[20,21]

In our study, the majority of students found Google Classroom to be an adequate and useful forum to interact with faculty and discuss their queries. Similar studies found that the use of these kinds of systems could report some benefits, particularly to those who feel embarrassed to interact openly within the classroom. Through online teaching modality, such students can comfortably discuss their problems with their teachers.[22] In particular, more students were satisfied with feedback received from the faculty. Feedback is an essential component of the learning of

the students and the academic process, which helps to identify the areas of improvement and progress of the students.[23] Similar results were obtained in another study in which teachers were more involved, giving answers and feedback to the queries while observing the students during online teaching.[24] This study also highlighted the satisfaction of the students with Google Classroom as an effective study tool and learning aid. This platform can not only be used to deliver academic content both asynchronously and synchronously, but can also be linked with features like Google forms, which can be used for assessing the learning of the student quizzes, and therefore monitor their academic progress.[25] In addition, assignment submission becomes very handy as students can easily submit their work via mobile phones. In addition, students are able to see the deadline for the submission and topic of their assignment. Notifications appear in their account, if students are late to submit their assignment, hence directing the students towards self-monitoring and life-long learning practices.[26] This was also reported in our study, where the students did not face much difficulty in making assignments and submitting them within the stipulated period.

Our study also found that students had faced problems in attending lectures online due to internet interruption. A similar result was reported by another study, in which participants from the entire country were not satisfied with the internet connectivity and wanted fast internet services for a better E-leaning experience.[27] This is an essential factor to be considered while conducting any educational activity online synchronously in countries where power outages and internet interruptions are fairly common. Therefore, the option of asynchronous learning activities could be explored, and such opportunities should be available to the students for their uninterrupted learning.

Results of the present study revealed an overall significant contrast between the responses of basic science students and clinical science students. It was observed that the students of 3rd and final years showed an overall higher dissatisfaction response rate to different features of E-learning in comparison to 1st and 2nd-year students. The reason could be that the academic content of pre-clinical years largely focuses on basic and theoretical concepts, and therefore could be adequately covered through online classes using Google

Classroom. However, in clinical years as mentioned previously, the educational curriculum is based on clinical learning, practical demonstrations, and hands-on practice in labs and OPDs. This clinical experience cannot be replaced by the online visual content that online learning platforms offer, and therefore the students would feel dissatisfied in the absence of this essential component of their academic learning. Similar results were observed in dental schools in India and Saudi Arabia where students in pre-clinical showed a good response towards e-learning compared to their clinical years.[28, 29]

Results of the current survey also revealed that regardless of the year of dentistry, students were still inclined towards online learning and wanted it as a part of their regular study strategy. However, considerable efforts need to be made for establishing effective policies for the online pedagogy approach. Other studies to identify areas of improvement can be conducted so that online teaching strategies would further enhance the interest and subsequent learning of the students.

The study was conducted in a single dental college in Pakistan among 200 students only. Hence, the results of the study cannot be generalized. Apart from this, detailed interviews of some students in order to inquire about the reasons for dissatisfaction with Google Classroom as a learning and assessment platform would help to derive more meaningful inferences. Also, the perception of faculty regarding the use of Google Classroom to deliver educational content was not assessed.

No such study has been conducted in our institute to determine the perception of students using the Google platform, which was predominately utilized for academic activities during the lockdown period. Perception of students of all years was assessed which helped to gauge the satisfaction of both pre-clinical and clinical students. The results of this study could help prompt the conduction of further research exploring the perception of our students to other online platforms that may have been used by the faculty to conduct teaching sessions.

CONCLUSION

This study determines the perception of Google® Classroom among dental students of a public sector dental college. Overall, the students have agreed to the usefulness of Google Classroom and are inclined to consider it as a part of their

regular study strategy. They have found it helpful for timely and convenient assignment submission. Furthermore, the students received feedback about their queries from the faculty which helped them to be adequately prepared for their exams. Even though there is a difference in satisfaction with Google Classroom between basic and clinical academic years, the study reveals overall acceptance of Google Classroom by the students. This study concludes that undergraduate dental students considered Google Classroom as a user-friendly, helpful, and modern e-learning tool for academic purposes and preparation for their assessments during the COVID lockdown.

Authors Contribution

Funding

Institutional ethical board approval

The study was approved by the Ethical Review Committee (JSMU/IRB/2021/-451) of Jinnah Sindh Medical University, Karachi, Pakistan.

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Conflict of Interest

The authors report no conflict of interest

REFERENCES

1. Gudmundsdottir GB, Hathaway DM. " We Always Make It Work": Teachers' Agency in the Time of Crisis. J Tech Teach Educ. 2020;28(2):239-50.
2. Mehall S. Purposeful Interpersonal Interaction in Online Learning: What Is It and How Is It Measured? Online Learning. 2020;24(1):182-204.
3. Mathivanan SK, Jayagopal P, Ahmed S, Manivannan S, Kumar P, Raja KT, et al. Adoption of E-Learning during Lockdown in India. Int J Syst Assur Eng Manag. 2021:1-10.
4. Mukhtar K, Javed K, Arooj M, Sethi A. Advantages, Limitations and Recommendations for online learning during the COVID-19 pandemic era. Pak J Med Sci. 2020;36(COVID19-S4):S27.
5. Pandey D, Ogunmola GA, Enbeyle W, Abdullahi M, Pandey BK, Pramanik S. COVID-19: A Framework for Effective Delivering of Online Classes During Lockdown. Human Arenas. 2021.
6. Pandey D, Gul R, Canete Jjo, Rocha Icn, Gowwrii G, Pandey BK, et al. Mental stress in online learning during the pandemic: an assessment of learners perception. Asian J Advan Res. 2021:37-49.
7. Kazi M, Shidhore AA. Google classroom sessions as a modern e-learning tool for the second year undergraduate dental students-A questionnaire feedback study. Int J Med Sci Public Health. 2020;9:1.
8. Pandey D, Ogunmola GA, Enbeyle W, Abdullahi M, Pandey BK, Pramanik S. COVID-19: A framework for effective delivering of online classes during the lockdown. Human Arenas. 2021:1-15.
9. Abbasi S, Ayoob T, Malik A, Memon SI. Perceptions of students regarding E-learning during Covid-19 at a private medical college. Pak J Med Sci. 2020;36(COVID19-S4):S57.
10. Cassum S, Mansoor K, Hirji A, David A, Aijaz A. Challenges in Teaching Palliative Care Module Virtually during COVID-19 Era. Asia-Pac J Oncol Nurs. 2020;7(4):301.
11. Wu DT, Wu KY, Nguyen TT, Tran SD. The impact of COVID-19 on dental education in North America—Where do we go next? Eur J Dent Educ. 2020;24(4):825-7.
12. Dhawan S. Online learning: A panacea in the time of COVID-19 crisis. J Educ Technol Syst. 2020;49(1):5-22.
13. Aguiar CM, Pessoa MAV, Câmara AC, Perrier RA, de Figueiredo JAP. Factors involved in the choice of dentistry as an occupation by pernambuco dental students in Brazil. J Dent Educ. 2009;73(12):1401-7.
14. Orenuga OO, da Costa OO. Characteristics and study motivation of clinical dental students in Nigerian universities. J Dent Educ. 2006;70(9):996-1003.
15. Jena PK. Impact of pandemic COVID-19 on education in India. Int J Curr Res. 2020;12.
16. Kumar JA, Bervell B. Google Classroom for mobile learning in higher education: Modelling the initial perceptions of students. Education and Information Technologies. 2019;24(2):1793-817.
17. Islam MS. Bangladeshi University Students' Perception about Using Google Classroom for Teaching English. Psycho-Educational Research Reviews. 2019:57-65.
18. Shaharanee INM, Jamil JM, Rodzi SSM. The application of Google Classroom as a tool for teaching and learning. J

Telecommun Electron Comput Eng. (JTEC). 2016;8(10):5-8.

19. Sandars J, Morrison C. What is the Net Generation? The challenge for future medical education. J Med Teach. 2007;29(2-3):85-8.

20. Hattar S, AlHadidi A, Sawair FA, Abd Alraheam I, El-Ma'aita A, Wahab FK. Impact of COVID-19 pandemic on dental education: online experience and practice expectations among dental students at the University of Jordan. BMC Med Educ. 2021;21(1):1-10.

21. Bauchner H, Sharfstein J. A bold response to the COVID-19 pandemic: medical students, national service, and public health. Jama. 2020;323(18):1790-1.

22. Burgess O. Cyborg teaching: The transferable benefits of teaching online for the face-to-face classroom. J Online Learn Teach. 2015;11(1):136.

23. Nicol DJ, Macfarlane-Dick D. Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. Studies in higher education. 2006;31(2):199-218.

24. Okita SY, Turkay S, Kim M, Murai Y. Learning by teaching with virtual peers and the effects of technological design choices on learning. Computers & Education. 2013;63:176-96.

25. Atmojo AEP, Nugroho A. EFL classes must go online! Teaching activities and challenges during COVID-19 pandemic in Indonesia. Reg J. 2020;13(1):49-76.

26. Sukmawati S, Nensia N. The Role of Google Classroom in ELT. Int J Educ Vocat Guid. 2019;1(2):142-5.

27. Khan SA, Khan AA, Bhatti R. Internet access, use and gratification among university students: a case study of the Islamia University of Bahawalpur, Pakistan. Chinese Librarianship: Int Electron J. 2011;32:1-14.

28. Tangade PS, Mathur A, Gupta R, Chaudhary S. Assessment of stress level among dental school students: an Indian outlook. Dent Res J. 2011;8(2):95.

29. Al-Saleh SA, Al-Madi EM, Al-Angari NS, Al-Shehri HA, Shukri MM. Survey of perceived stress-inducing problems among dental students, Saudi Arabia. Saudi Dent J. 2010;22(2):83-8.