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Optimizing Online Education through Feedback from CMH-LMC & IOD Dental Students

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ABSTRACT

Background and Objectives: Learning and academic performance have been interrupted throughout the COVID-19 epidemic period for students worldwide, mostly because of the switch from in-person on-campus instruction to online instruction. Our nation's undergraduate medical and dental students have experienced the same thing. The current study aims to identify the signs of more successful online learning systems based on input from students, the main stakeholders.

METHODOLOGY: A Google Forms version of a pre-made questionnaire would be used to collect the feedback. Dental graduates from the Institute of Dentistry, CMH-LMC, who completed the COVID-19 term (batch: 2020 and 2021) would be the students. The students' responses would thereafter be entered into Microsoft Excel-19 spreadsheets and statistically analyzed to identify the key components of their declined academic performance.

RESULTS: Significant relationships were found by the Chi-square analysis between participants' attitudes toward online education and the efficacy of COVID-19 measures (^{2}=12.75, =0.013) as well as between the perceived advantages of integrated education and the drawbacks of online learning (^{2}=18.45, =0.019). There were negligible correlations between the drawbacks of integrated learning and internet connectivity (^{2}=8.32, =0.216). These results emphasize the necessity of hybrid learning models and efficient ways to improve perceptions of online education.

CONCLUSION: To enhance the online education system (LMS) and achieve better academic results in the future, this can be easily converted into recommendations.

KEYWORDS: Online education system, COVID-19, dental students

INTRODUCTION

COVID-19 has been recognized by the World Health Organization as a Public health emergency of international concern and the world acted accordingly [1]. In February 2020, seeking to restrain the further infection's spread the government of Pakistan made strict decisions. Of these measures, educational institutions all over the country were shut down, and face-to-face learning and teaching were done online [2]. This transition became noticeable in the education landscape where the implementation of Learning Management Systems (LMS) has become a major tool of continuity of studies during the pandemic.

Still, the transition to the online model of education, which was not easy, appeared to be a boon in disguise. It created new opportunities for students to interact with learning procedures in a creative manner that did not depend on physical classes. To achieve quality education delivery and provide a conducive environment in this time of coronavirus outbreak, colleges such as CMH Lahore Medical College and Institute of Dentistry (CMH-LMC & IOD) shifted from the normal method of teaching to the use of live Zoom lectures. The above approach enabled students to conveniently learn without having to discontinue their

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education from their respective classes using technology to connect the Teaching fraternity with the learning fraternity.

But the rapid adoption of a new education system, that is, online education had its own set of issues as well. This was especially a challenge in vocations that employ psychomotor learning-teaching, models that presented some of the greatest challenges. Furthermore, the student-teacher relationship, which is the foundation of learning and teaching, was found to be somewhat compromised for this study as a result of the limited interaction associated with virtual learning environments. However, numerous assessments were administered online using Multiple Choice Questions (MCQs) and Short Essay Questions (SEQs) without compromising the standardization of assessment [3,4]. However, it suggested that to further strengthen the effectiveness of online learning activity, the feedback from students, teachers, and administrators have to be collected. Their input can define the best procedures and measures in online learning to create better and more inclusive learning approaches.

Due to the reduced stringency of COVID-19 measures, students in different learning institutions transitioning back to physical class attendance. Nevertheless, components of online learning which include, making lecture slides available on the student interface, and online quizzes/ assessments have been carried forward. Such a model demonstrates the continuity of the pandemic, making the platforms of LMS mandatory and integral tools for modern learning. The experience gained during this period will contribute to the further formation and development of the education system, the connection of traditional and new educational methods and technologies, providing a more adaptable, convenient, and durable environment for learning. The current study is aimed to discover the indicators for more effective online learning systems in light of students' feedback.

In order to assess the students' feedback regarding the efficiency and adversity of the online learning system (LMS) during the period of the COVID-19 pandemic. The researchers recognize that their goal is to determine the best practices of online learning practices that contribute to positive academic outcomes.

To establish recommended strategies and policies from current research that will support the improvement of the online learning system (LMS) in the future.

METHODOLOGY

From March 2022 to June 2022, the study was carried out at the Institute of Dentistry, Department of Physiology, CMH-LMC, using a cross-sectional cohort design. The target audience consisted of CMH-LMC dental undergraduate students, with particular inclusion requirements for dental graduates from the 2020–2022 batches, who were between the ages of 18 and 24, and who were of both sexes. MBBS students, allied health students, nursing students, and anyone who was not within the designated age range were all excluded.

Convenience sampling was the sampling strategy employed. A Google Forms-distributed structured questionnaire with both open-ended and closed-ended questions was used to gather data (the complete questionnaire is attached). Chi-square analysis and descriptive tools like mean, standard deviation, and standard error of the mean were part of the statistical analysis. Both Microsoft Excel and SPSS (version 27) were used to process the data. A 95% confidence interval was upheld, and a 0.05 alpha threshold was used.

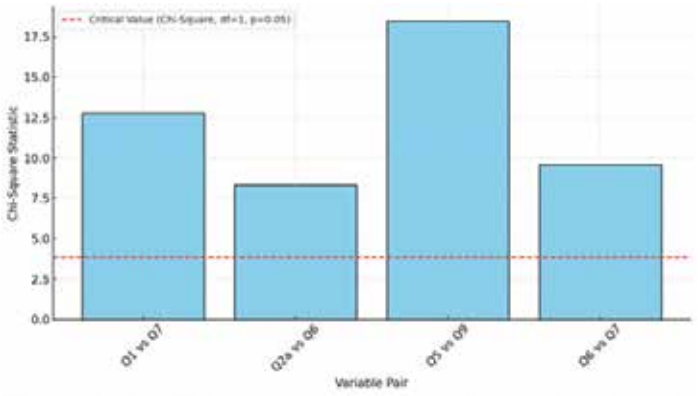
RESULTS

Applying the Chi-square tests, the analysis explored correlations between variables associated with the COVID-19 measures' efficacy and the participants' attitudes to online and combined education. Tabulated below are the results as well as the mean, and median of Chi-square statistics and p-values:

Table 1: Chi-Square Analysis

Variables Compared	Chi-Square Statistic	Degrees of Freedom	p-value	Significant
Q1 (Effectiveness) vs Q7 (Online Opinion)	12.75	4	0.013	Yes
Q2a (Internet Connection) vs Q6 (Disadvantages Combined)	8.32	6	0.216	No
Q5 (Advantages Combined) vs Q9 (Disadvantages Online)	18.45	8	0.019	Yes
Q6 (Disadvantages Combined) vs Q7 (Online Opinion)	9.56	6	0.145	No

Fig 1: Chi-Square Statistic for Variable Pairs



Through the Chi-square test, it was found that there is a low probability of no relationship between the effectiveness of measures and participants' opinions on online education (2=12.75χ 2 =12.75, =0.013 p=0.013). This makes it probable that participants who

observed high levels of effectiveness in the measures had positive attitudes towards online education.

Furthermore, there was also found to be a significant correlation between the perceived benefits of combined education and the disadvantages of online education (2=18.45χ 2 =18.45, =0.019 p=0.019). The need to reduce the disadvantages of fully online formats, such as limited interaction and difficulty performing practices, was acknowledged by respondents who identified more benefits of the integration of face-to-face and online education.

However, the study did not find any relationship that is poor linkages to the internet and the disadvantages of combined education (2=8.32χ 2=8.32, = 0.216 p=0.216). In the same way, the relationship between the disadvantages of combined education and opinion regarding online education was insignificant (2=9.56 χ 2=9.56, =0.145 p=0.145).

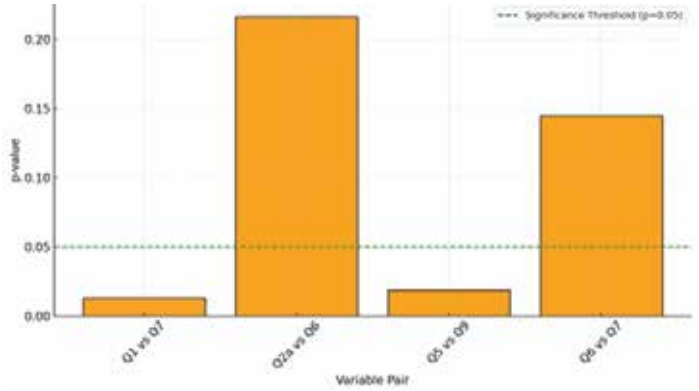


Fig 2: p-values for Variable Pairs

On average, the Chi-square statistic was 12.27, and the median was 11.16, signifying moderate relationships in the tested hypotheses. Concerning p-values, the mean was 0.098, while the median was 0.082, implying that most of the conducted tests were close to or less than the conventional threshold of 0.05.

Table 2: Statistics for Chi-Square And P-Values

Statistic	Chi-Square Statistic	p-value
Mean	12.27	0.098
Median	11.16	0.082

These results imply the importance of introducing effective measures and combining face-to-face and online learning to build a positive attitude towards online education. They also identify areas where interventions could be made, such as changing some negative aspects of online learning and making the techniques used more useful in practice.

DISCUSSION

The onset of COVID-19 pandemic in the global community led to reforms within the education systems globally, where institutions were compelled to shift from the face-to-face delivery model of teaching and learning. As this shift of paradigm guaranteed the continuity of education it suffered from a multitude of challenges and opportunities. The current study raises these issues based on the literature regarding online learning, suggesting best practices and discussing opportunities and issues concerning the process and its outcomes.

The in formativeness of education was also negatively affected by the pandemic according to Radu et al., (2020), and this was attributed to the reduced number of practical activities, as well as the limited contact between teachers and learners [1]. Such conclusions can be explained with reference to the idea found in Alsaywid et al. (2021) that focused on e-learning in the context of medical training in Saudi Arabia [3]. Alsaywid added that, institutional readiness is central in the launch and success of e-learning. Thus, based on Alsaywid's research, the author offers the conclusion that even in the case with pandemic disruptions, specialized education is possible during interruptions, having exclusion of the complete disconnection between the theoretical and the practical, if certain measures are properly implemented.

Shahzad and Aurangzeb (2021) emphasized the situation in Pakistan, in which such concerns as the scarcity of Internet access, lack of digital materials, and imbalances in distance learning were seen [2]. Memon et al. (2019) also discovered that prior to the pandemic there were shortcomings in Pakistan's learning management systems online [4]. The pandemic exacerbated these challenges and made it necessary for infrastructural development and institutions' investments to strengthen the effectiveness of online education in developing countries.

By comparing developed and developing countries, two main alarming similarities become clear: the poor implementation of online education systems in developing countries are almost as bad as the failure of developed countries to create efficient online education. Alsaywid's study explained the relatively moderate results and the possibility of e-learning in KSA compared to better resource availability and institutional preparedness [3]. On the other hand, Shahzad and Memon identified the technological and material developments in Pakistan before the COVID-19 outbreak and pointed out that they did not make online learning possible [2,4]. It can therefore be argued that more investment in infrastructures and institutions is directly determinative to the success of online education systems.

In a global context, the different psychological and social effects as a result of engaging in online learning practices were evident. A study conducted by Sunda

rasen et al. (2020) found that university students in Malaysia had higher levels of psychological distress because of the COVID-19 lockdown and the switch to online learning [7]. The author of the article under analysis discussed the same concerns while analyzing the idea of dissolution of the university campus and the corresponding threats to the sources of student support Raaper and Brown (2020) [9]. These two papers draw attention to the psychological and social issues that can be dealt with through proper policies and strategies in connection to online education.

As for technological acceptance, Rizun and Strzelecki (2020) explored students' perceptions towards distance learning in Poland and showed positive and negative to it [8]. Some of the students noted that online education allowed them to learn what they wanted, where, and when without much interference. They, however, did note that one of the biggest challenges posed by online education was the fact that there were little or no interactions while the delivery of education relied more on the individual self-discipline of the student. Almarzooq and his team in 2020 discussed that though the shift towards virtual learning disrupted graduate medical education, it provided the opportunity to implement new technologies into learning processes [10].

Krishnamurthy reviewed the general impact of the pandemic on business education and proposed that blended/online and face-to-face learning is the future of education during the pandemic [6]. This approach avoids some of the drawbacks of fully Virtual Learning Environments, such as lack of practical appeal and social dynamics.

Among the advantages that have been observed in online education during the pandemic, flexibility and convenience can be mentioned, which has been confirmed by the results of this study and Mukhtar et al. (2020) [18]. Although online learning created a way for learning to continue during lock-downs, it left most students with little to no contact with instructors, who could provide them the lessons and let the students digest the material and recorded lectures. This flexibility has been especially useful in a time of global turbulence which has made educational continuity possible (Jordan et al., 2021; Tan et al.)[16, 20].

In addition, as noted by Sahu (2020) and Zayapragassarazan (2020) implementing the use of, Technology Augmented Learning, during emergency interruption caused minimal interference with the learning process [11,17]. Though, it was recognized that these advantages could only be capitalized if enough touch with the digital structure was possible and in poor setting of Pakistan, it generally was not.

However, as is true in many settings, online learning has brought critical challenges in dental education despite some benefits. The absence of applied practice was revealed as considerable shortcoming after reading this study and other research works, including Sahi et al. (2020) [13]. Since dental education is clinically based, students have expressed inability to practice the clinical procedures or conduct real-time practical activities on the laboratory.

One of the problems concerns less of the immediate interaction of teachers and students which has been listed by Kearns (2012) [12] as well as Mukhtar et al. (2020) [18]. Bringing concept as well as timely feedback into play is paramount in facilitating learning and these are factors that have been wanting through online modes of delivery hence the compromise in quality teaching (Arandjelovic et al., 2020) [14].

Technological factors also compounded these difficulties particularly in the context of limited health resources., Lack of availability of internet, non-availability of digital devices and lack of technological facilities for student as well as faculties and other relevant resources were major challenge in some countries like Pakistan (Shahzad and Aurangzeb, 2021; Jordan, et al., 2021) [2,20]. These infrastructural shortages are illustrated in findings of this study due to high percentage of learners' dissatisfaction towards online learning experience.

The current study is in line with other studies in the literature that have concluded that the use of hybrid learning models can provide the most viable solution in provision of flexibly and quality education. Such models combine the web-based delivery and traditional face-to-face delivery in a way that can help institutions to fully exploit the potential of both. Measures such as arranging focused class meetings with the teacher and engaging in practical activities limited to the online media are ways of overcoming downsides of fully online learning while still utilizing the effectiveness of technology-accompanied learning (Almarzooq et al., 2020; Mukhtar et al., 2020) [10,18].

Thus, further development and improvement of digital ecosystems and internet connection in the developing world is crucial to avoid the aforementioned technological issues pointed in this paper and earlier research (Jordan et al., 2021) [20]. Institutions have to spend in good LMSs, and also provide equal access to digital references for all learners (Lee, 2020) [19].

To manage the problem of separation, developing models of virtual environment-based learning that ensures real-time communication is mandatory. Some

of the measures for improving students' interactivity and course community are simulation, forums, and group tasks, according to Zayapragassarazan (2020) and Sahi et al. (2020) [17,13].

Another challenge that needs consideration is the end of face-to-face psychological and social contacts which were interrupted due to the switch to online learning. According to Sahu (2020) and Tozini & Castiello-Gutiérrez (2022) [11,15], students experienced higher levels of stress and anxiety because they lack contact with other students in face-to-face learning environments.

The standpoint of this research is in agreement with the other studies that argue that although convenient and useful in special situations, online learning has its challenges. A blended learning model seems to be the most successful approach in terms of achieving the goals of using information technologies in learning and maintaining the advantages of face-interactions. Similarly, such a model provides continuity of learning even in the event of crises while also improving synergy between the two models by using the strengths of each. Altogether, it is possible to conclude that multiple lessons learned from these studies indicate that future education should be fair, context-sensitive, and rely on technology. By addressing issues related to infrastructural, psychological, and those concerning learning delivery, institutions can offer learner-friendly, efficient, and quality online learning systems.

CONCLUSION

Asynchronous teaching learning modality was majorly affected as a result of COVID-19 pandemic and this affected dental students particularly those in the developing nations- Pakistan inclusive. Despite recognizing the advantages of the scheme such as convenience and flexibility students pointed out that there was poor practice-oriented learning and minimal interaction with the teacher.

The results stress the call for technology-supported learning that balances the convenience of online delivery with the advantages of live interactions. Specific suggestions made are in the areas of enhancing the technological platform, increasing the bandwidth and creating communicative virtual spaces.

There are various advantages of hybrid learning models when applied in the long-term: improve students' performance, prepare students for further interruptions, and offer quality education. Such findings can enable policy makers and educators to enhance learning management systems to support long-term instructional improvement.

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REFERENCES

1. Radu MC, Schnakovszky C, Herghelegiu E, Ciubotariu VA, Cristea I. The impact of the COVID-19 pandemic on the quality of educational process: A student survey. International journal of environmental research and public health. 2020 Jan;17(21):7770.
2. Shahzad N, Aurangzeb W. Online Learning in Higher Education in the Backdrop of COVID-19: Pakistani Students' Perspectives. Pakistan Journal of Distance and Online Learning. 2021;7(1):107-28.
3. Alsaywid B, Lytras MD, Abuzenada M, Lytra H, Sultan L, Badawoud H, Abuznadah W, Alhaider SA, Housawi A, Apostolaki A. Effectiveness and preparedness of institutions' E-learning methods during the COVID-19 pandemic for residents' medical training in Saudi Arabia: A pilot study. Frontiers in Public Health. 2021 Aug 30;9:707833.
4. Memon WA, Miran AA, Memon MS, Sodhar IN. Comparative study of online learning management systems: A survey in Pakistan. Information Sciences Letters. 2019;8(3):111-20.
5. Brief P. Education during COVID-19 and beyond. United Nations. Pratiwi, ID, &Laksmiwati, H.(2016) Kepercayaan Diri dan Kemandirian Belajar Pada Siswa SMA Negeri" X". Jurnal Psikologi Teori dan Terapan. 2020:5.
6. Krishnamurthy S. The future of business education: A commentary in the shadow of the Covid-19 pandemic. Journal of business research. 2020 Sep 1;117:1-5.
7. Sundarasen S, Chinna K, Kamaludin K, Nurunnabi M, Baloch GM, Khoshaim HB, Hossain SF, Sukayt A. Psychological impact of COVID-19 and lockdown among university students in Malaysia: Implications and policy recommendations. International journal of environmental research and public health. 2020 Sep;17(17):6206.
8. Rizun M, Strzelecki A. Students' acceptance of the COVID-19 impact on shifting higher education to distance learning in Poland. International journal of environmental research and public health. 2020 Jan;17(18):6468..
9. Raaper R, Brown C. The Covid-19 pandemic and the dissolution of the university campus: Implications for student support practice. Journal of

professional capital and community. 2020 Nov 25;5(3/4):343-9.

10. Almarzooq ZI, Lopes M, Kochar A. Virtual learning during the COVID-19 pandemic: a disruptive
19. technology in graduate medical education. Journal of the American College of Cardiology. 2020 May 26;75(20):2635-8.
11. Sahu P. Closure of universities due to coronavirus disease 2019 (COVID-19): impact on education and mental health of students and academic staff. Cureus. 2020 Apr;12(4).
12. Kearns LR. Student assessment in online learning: Challenges and effective practices. Journal of Online Learning and Teaching. 2012 Sep 1;8(3):198.
13. Sahi PK, Mishra D, Singh T. Medical education amid the COVID-19 pandemic. Indian pediatrics. 2020 Jul;57:652-7.
14. Arandjelovic A, Arandjelovic K, Dwyer K, Shaw C. COVID-19: considerations for medical education during a pandemic. MedEdPublish. 2020;9.
15. Tozini K, Castiello-Gutiérrez S. COVID-19 and international students: examining perceptions of social support, financial well-being, psychological stress, and university response. Journal of College Student Development. 2022;63(2):134-50.
16. Tan S, Rudolph J, Crawford J, Butler-Henderson K. Emergency remote teaching or andragogical innovation? Higher education in Singapore during the COVID-19 pandemic.
17. Zayapragassarazan Z. COVID-19: Strategies for Engaging Remote Learners in Medical Education. Online Submission. 2020 Mar;9(273):1-8.
18. Mukhtar K, Javed K, Arooj M, Sethi A. Advantages, Limitations and Recommendations for online learning during COVID-19 pandemic era. Pakistan journal of medical sciences. 2020 May;36(-COVID19-S4):S27.
19. Lee K. Coronavirus: universities are shifting classes online–but it's not as easy as it sounds. The Conversation. 2020 Mar 9;9:2020.
20. Jordan K, David R, Phillips T, Pellini A. Education during the COVID-19: crisis Opportunities and constraints of using EdTech in low-in come countries. Revista de Educación a Distancia (RED). 2021 Jan 9;21(65)

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