Interdisciplinary Journal of Virtual Learning in Medical Sciences

Original Article

Medical and Nursing Students' Perception and Experience of Virtual Classrooms during the COVID-19 Pandemic in Nepal

Pramila Poudel[1*], MSc; Garima Tripathi[2], MD; Ramesh Ghimire[3], MD

[1]*Department of Nursing, National Medical College Teaching Hospital, Parsa, Nepal*
[2]*Department of Community Medicine, National Medical College Teaching Hospital, Parsa, Nepal*
[3]*Department of Anesthesiology, National Medical College Teaching Hospital, Parsa, Nepal*

ABSTRACT

Background: On March 9, 2020, the government of Nepal declared suspension of all academic activities in line with a nationwide lockdown following the COVID-19 outbreak. To keep pace with the academic calendar, medical universities resumed their teaching and learning activities through virtual means on account of non-feasibility of holding physical classes. The present study sought to identify the perception and experiences of undergraduate medical and nursing students regarding the virtual classrooms.

Methods: We adopted a sequential explanatory mixed method design whereby data were collected in two phases. Quantitative data were gathered from a survey (n=737) and qualitative data from focused group discussion (n=14). The participants were recruited using a non-probability Peer Esteem Snowballing technique. Quantitative data were analyzed using descriptive and inferential statistics, whereas qualitative data was examined using a narrative thematic analytic approach.

Results: Mean age of participants was 22±2.01 with (81%) female participation. The quantitative findings revealed that the "synchrony" domain had the highest mean score (4.10±0.47) and "course interaction" had the lowest mean score (2.93±0.81) amongst the four domains. The domains were significantly correlated to each other (P=0.01) and (P=0.05). Results from focus group discussion indicated that interactions were lower in the virtual classes and there was a great variation between the learners' perception and their experiences of virtual classrooms. Students preferred blended classes to be implemented in future sessions.

Conclusion: In spite of various challenges, the students perceived the transition from traditional to virtual classrooms in a positive and enthusiastic way. An effective virtual learning experience requires a modified instructional approach on the part of educators and a consistent attitude from learners.

Keywords: New trend, Physical classes, Suspension, Virtual class, COVID-19

**Corresponding author:*
Pramila Poudel, MSc;
Department of Nursing,
National Medical College
Teaching Hospital, Parsa,
Nepal
Tel: +977 980 3372524
Email: pdlpramila123@yahoo.com

Please cite this paper as:
Poudel P, Tripathi G, Ghimire R. Medical and Nursing Students' Perception and Experience of Virtual Classrooms during the COVID-19 Pandemic in Nepal. Interdiscip J Virtual Learn Med Sci. 2021;12(2):85-96.doi:10.30476/ijvlms.2021.89644.1076.

Received: 06-01-2021
Revised: 13-02-2021
Accepted: 24-02-2021

Introduction

The World Health Organization (WHO) declared the outbreak of novel coronavirus (COVID-19) as a Public Health Emergency of International Concern on January 30, 2020, following the recommendation of

their emergency committee (1). Response to this global crisis was accompanied by travel restrictions, border shutdowns, quarantines and self-isolation in countries across the globe leading to a standstill and further recession of global economy (2). This recession is expected to have long-lasting health and socioeconomic consequences, including partial or full closure of educational systems. It has led to disparities in the accessibility of education especially in developing countries struggling with technological and economic difficulties. This has been a major challenge to the fulfilment of Sustainable Development Goals (SDG 4) that aim to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (3).

UNESCO estimates that more than 90 percent of the world's students (1.7 billion) have to stay home under lockdown to combat the spread of COVID-19. In Nepal, schools and universities were closed and all examinations were suspended until further notice. Over 35,000 schools are currently closed and over eight million students are staying at home (4). On March 19, 2020, the government of Nepal declared suspension of all classes in order to prevent the spread of COVID-19 (5). In a parallel effort, a mandate was officially announced on March 24, 2020, for a nationwide lockdown (6). In the midst of the crisis, medical universities in Nepal were also forced to suspend all of their classes. Tribhuwan University (TU), is the oldest and biggest public university in Nepal. Since in-person teaching was not feasible, the executive council of TU released a circular (22-Apr-20 referral no: 177/076/077) to all its constituent and affiliated colleges to resume their teaching-learning activities through virtual means so as to keep in pace with the academic calendars (7). Simultaneously, other universities also resumed their teaching-learning activities through virtual platforms. In spite of the existing ICT infrastructures and related educational policies in Nepal, virtual learning remained at a standstill and failed to initiate a paradigm shift in education due to lack of strategies related to its implementation (8).

Despite numerous obstacles, virtual learning emerged as a new normal in education with the aim of engaging and empowering students in the present global crisis. Moreover, in developed countries virtual learning has paved its way into mainstream education (9). A virtual classroom is conducted in real time, allowing teachers and students to interact, communicate, collaborate and explain ideas through video conferencing (10). It is a form of distance education wherein an online learning environment is created and can be delivered in a variety of formats (11). The pandemic has brought about a major transition from "Chalk and Talk" to technological teaching (12). Traditional classrooms are being substituted by innovative virtual teaching techniques in the form of webinars using various electronic platforms such as Zoom Meeting, Google Cloud, etc. This transition in medical and nursing education has many challenges especially in developing countries like Nepal, which are struggling with the lack of strong internet bandwidth and smart gadgets (13).

Students can benefit from virtual classrooms as it stimulates participation, synchrony, and a sense of community. Students and teachers can communicate, interact and watch discussions in virtual classrooms in a similar fashion to physical classrooms (14). Interaction refers to a direct involvement with someone or something. Virtual classrooms can be as interactive as physical classrooms since students and teachers can see and hear each other while using the learning resources. The synchronization effect of virtual classrooms enables students to stay connected at the same time, and gain access to the same instructor and learning resources simultaneously. In a virtual classroom, learning has to be community oriented, focusing on students' experience and their relationship with each other. In today's technology-oriented world, perceived usefulness and ease of use refer to how fair it is to gain mastery in walking along with the pace of technology (15).

In the face of COVID-19, medical and

nursing curricular adaptations should elicit flexibility in the existing pedagogical approaches, especially in terms of delivery and administration. This helps to remain in compliance with the accreditation standards (16). Transition from traditional to virtual classroom is a new challenge to the education system in Low- and Middle-Income Countries (LMICs) including Nepal (17). Given the limited relevant literature available in LMICs, research on virtual learning is necessary to explore its suitability in our context. Features of virtual classes have been identified as a key element in determining the effectiveness of virtual learning. Thus, this study aimed to explore how the medical and nursing students have perceived and experienced the features of virtual classes.

Methods

Study Design

A sequential explanatory mixed method research design (18) was applied in two phases over a period of four months, August to November 2020. The data was collected sequentially to explore and explain the students' perceptions and experiences regarding the features of virtual classrooms.

Study Population

The participants were the undergraduate medical and nursing students currently enrolled in second, third and fourth year of their program. The programs were offered by Tribhuwan University (TU), Kathmandu University (KU), National Academy of Medical Sciences (NAMS), Purbanchal University, and Pokhara University.

Sampling and Data Collection Methods

All participants who were available for a web-based survey, were willing to participate and attended at least 30 virtual sessions during the COVID-19 lockdown were eligible to participate in the survey. Only the early seed members (19) were eligible to participate in the second phase of the study. As for the quantitative phase, Google Form was created as a tool for data collection. It was posted online during August 2020 and circulated in various social media platforms. From each batch of MBBS, BSc Nursing and BNS programs offered by different university colleges, one student was recruited as a member of early seeds for the study. After being briefly oriented to the purpose of the study, the seeds were sent the link to the research instrument via Facebook messenger. They urged fellow students to participate in the study and further continued on the basis of chain referral, using Nonprobability Peer Esteem Snowballing technique. A total of 737 students were connected to the chain and participated in the first phase of the study. For qualitative data collection, the seeds were purposively called on to participate (n=14) in the virtual focus group discussion Via Zoom (October 27, 2020). After obtaining the participants' digital, verbal and written consent, the audio version of the discussion was recorded. Two Zoom sessions were held with seven participants in each session. The duration of each session was 40-50 minutes. The FGD was moderated by two moderators who are the principal investigators of the study.

Data Collection Tools

Quantitative Research Instrument

The original instrument was developed and validated by Michael & Florence (16) and adopted in our study with their digital consent. It was comprised of two sections; the first section included socio-demographic, institutional and technology-related information. Second section included 22 items grouped in four categories, which represent the characteristics of virtual learning in 4 domains, namely interactivity, synchrony, usefulness and ease of use, and sense of community. The items of the original tool were rated on a 4-point Likert scale (4=strongly agree, 1=strongly disagree). The tool was modified and scored on a 5-point Likert scale (5=strongly agree, 4=somewhat agree, 3=Neutral, 2=somewhat disagree, 1=strongly disagree). The Cronbach's alpha value for the features of the Virtual Classroom was 0.92, and for each characteristic it was

as follows: interactivity α=0.70, synchrony α=0.70, usefulness and ease of use α=0.76, and sense of community α=0.77. Face and content validity of the questionnaire were previously established in Michael and Florence's study (16). In the present study, qualitative face validity was determined by consulting 7 experts in the field of virtual learning and statistics, and accordingly the questionnaire was revised for structural and grammatical errors. Also, to re-evaluate the content validity, the same group of experts were consulted again and the level of agreement was above 85.7 percent. Reliability of the instruments was determined by testing 80 participants, and the internal consistency as measured by Cronbach's alpha was 0.81. The obtained value of scale stood above the recommended threshold; the tool was validated for use in the present study (20).

Qualitative Research Instrument

The second phase of the study was guided by the following research questions:

1. How did you feel when you first heard about your suspended classes being resumed in the form of a virtual classroom?
2. What barriers do you think there are in understanding and using virtual classes?
3. How do you compare physical and virtual classes?
4. From your experience, do you recommend physical, virtual or blended classes in the future?

Data Analysis: Quantitative

After receiving the questionnaire from the participants, they were extracted to Microsoft Excel and made available for offline use. Retrospective cleaning of data was carried out before the data was exported to SPSS 23 for statistical analysis. Descriptive statistics (frequency and percentage) and inferential statistics (one sample t-test and Pearson Correlation) were applied.

Data Analysis: Qualitative

For qualitative data, the audio recordings obtained from focus group discussions were analyzed using a narrative thematic analysis approach. First, verbatim transcription of the recordings was carried out and themes were generated manually on the margins of the transcript. During transcription, the identifiers (names and locations) were assigned fictitious names or were removed. The next stage involved coding of the data wherein the most significant words, ideas

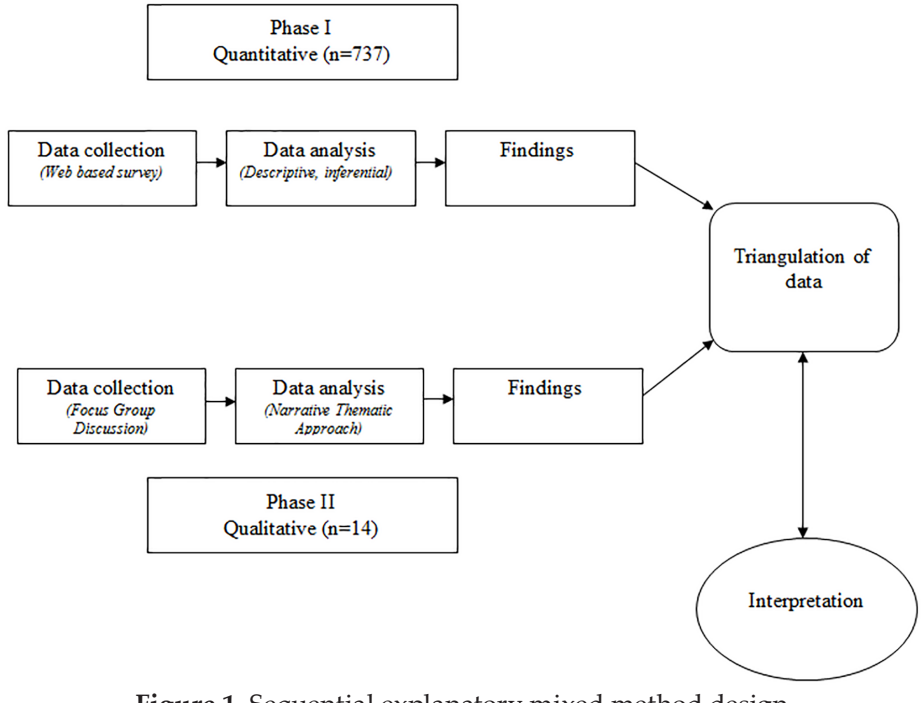

Figure 1. Sequential explanatory mixed method design

or patterns were narrated and organized. The transcript was reread multiple times by the investigators individually or in groups. Any differences in coding were discussed and addressed conclusively. After the first revision of the transcript was completed, a master code list was constructed. The codes were logically categorized and placed along with the themes to support the objectives of study (Figure 1).

Ethical Considerations

Informed digital consent was obtained from the participants. The study could only proceed further once the participants agreed to participate by clicking on the "Yes" button. To maintain confidentiality, the data was not personalized. During focus group discussion, students were told that they were not required to keep their videos on or log in with their formal names. Informed digital, verbal and written consent was obtained from the participants before the Zoom meeting begun. Students were notified that the discussion was going to be recorded and were assured that data will remain confidential, only to be used for present research.

Table 1. Students' demographic, technology and institution related information

Variable	**n=737 Frequency (%)**
Mean Age=22±2.0	
Gender	
Male	140 (19.0%)
Female	597 (81.0%)
Course of Study	
BNS	80 (10.9%)
BSc. Nursing	405 (55.0%)
MBBS	252 (34.1%))
Academic Year	
2nd Year	274 (37.2%)
3rd Year	296 (40.1%)
4th Year	167 (22.7%)
Institutional Affiliation	
Tribhuwan University	330 (44.8%)
Kathmandu University	174 (23.6%)
Pokhara University	165 (22.4%)
Purbanchal University	41 (5.6%)
National Academy of Medical Sciences	27 (3.7%)
Current Residence	
Metropolitan city	216(29.3%)
Sub-metropolitan city	119(16.1%)
Municipality (Urban)	277(37.6%)
Municipality (Rural)	125(16.9%)
Type of device used for virtual class	
Laptop/desktop computer	251 (34.1%)
Mobile phone/tablet	334 (45.3%)
Whatever is available	152 (20.6%)
Type of internet used	
Wi-Fi access only	358 (48.6%)
Mobile phone data only	59 (8.0%)
Both	320 (43.4%)
Previous exposure to virtual learning	
Previously exposed	76 (10.3%)
Previously not exposed	661 (89.7%)

Results

Quantitative Phase

A total of 737 participants completed the web-based survey for the first phase of study. The mean age of participants was 22±2.0 ranging from 19 to 35. Majority (81%) of the participants were female. The major proportion of study participants (55.0%) were studying BSc Nursing and amongst them (40.1%) were currently enrolled in their third academic year. Regarding the institutional affiliation, the majority (44.8%) were affiliated with Tribhuwan University. The highest proportion of study participants (37.6%) were residing in urban settlements whereas the lowest proportion (16.1%) resided in rural areas. Regarding the gadgets used for virtual classes, 45.3% of participants used mobile phones or tablets. Furthermore, 48.6% of participants relied on Wi-Fi for internet connectivity, followed by 43.4% using both Wi-Fi and mobile data services. A significant proportion of participants (89.7%) had never attended any virtual classes other than the ones offered during the lockdown (Table 1).

Table 2 reveals that in the first domain, namely Course Interaction, the subscale with the highest mean was "instructor frequently attempted to elicit student interaction" (3.45±1.02). The featured statement "Students cannot talk freely because classmates could not be seen face to face" was rated lowest with the mean of (2.57±1.29). In regard to the second domain (Synchrony), the participants rated the feature "technical problems" with highest mean score (4.62±0.77). The feature "Monotonous" was rated by participants with the lowest mean score (3.60±1.21). As for the third domain (usefulness and ease of use), participants rated the feature "student lacks confidence in using technology" with the highest mean score (3.47±1.32). The

Table 2. Student's Perception regarding features of virtual classroom

Domain	Mean±SD
Domain 1: Course interaction	2.93**±0.81**
Virtual classroom facilitates teacher to student interaction	3.18±1.17
Quality of class discussion are high in virtual classroom	2.68±1.19
Virtual classroom facilitates student-to-student interaction	2.76±1.23
Can learn from fellow students in the class	2.89±1.15
Instructor frequently attempted to elicit student interaction	3.45±1.02
It is easy to follow class discussions	2.99±1.20
Could not talk freely because classmates could not be seen face-to-face*	2.57±1.29
Domain 2: Synchrony	4.10±0.47
Virtual classroom reduces the travel necessity	4.47±0.85
Helped to collaborate with peers without having to be in same classroom	3.65±1.12
Has bandwidth limitations of Internet	4.20±0.93
Has to encounter with technical problems	4.62±0.77
The class is monotonous	3.60±1.21
Domain 3: Usefulness and ease of use	3.09±0.82
It enhances effectiveness in learning	2.98±1.16
It improves performance	2.79±1.13
It is easy to become skillful in using the virtual classroom	2.95±1.33
It is easy to get the classroom do what it wants to do	3.07±1.06
I S Students can view the archived classroom session if missed	3.33±1.55
Students lack confidence in using technology*	3.47±1.32
Domain 4: Sense of community	3.06±0.79
Students feel isolated	2.94±1.31
Students do not feel a sense of belonging in the classroom	2.68±1.32
Not many collaborative activities*	2.29±1.18
Students have to work on their own for most of the assignments given	4.34±0.98

*Represents items that were reverse coded

feature "improves performance" was rated with the lowest mean score (2.79±1.13) in this domain. Regarding the fourth domain (sense of community), the participants rated the feature "students have to work on their own" with highest mean score (4.34±0.98). The feature "not very collaborative activities" was rated with the lowest mean score (2.29±1.18) (Table 2).

Course interaction had significant positive correlation with synchrony (r=1.00, P<0.01), usefulness and ease of use (r=0.22, P<0.01), and sense of community (r=0.09, P<0.05). Similarly, synchrony had significant correlation with usefulness and ease at use (r=0.22, P<0.01), sense of community (r=0.09, P<0.05). In addition, sense of community has positive correlation with all the other domains at the level of P=0.01 and P=0.05 (Table 3).

Qualitative Phase

In order to broadly identify the students understanding and experience of the virtual classroom, qualitative data obtained through focus group discussion was analyzed using a narrative analysis technique as a frame of reference, which sought to answer the qualitative research question (Table 4).

The data gathered from both phases of study were triangulated and further interpreted in order to obtain broader perspectives regarding the participants' experience with a virtual classroom (Table 5).

Discussion

The outbreak of COVID-19 has led to an abrupt transition in medical education. Traditional classrooms are replaced by virtual classroom, and chalk and board have been substituted by smart gadgets. Nevertheless, the impact of this substitution has remained undiagnosed to date in low- and middle-income countries (LMICs) like Nepal (3). The findings suggest that the students perceived features of virtual classrooms in a positive way as revealed in the quantitative phase. The domain synchrony has the highest mean score as rated by the students. The particular feature of "experiencing technical problems" had the highest rating amongst all subscales. Students experienced technical barriers as explained in the focus group discussion. Limitations with internet bandwidth are a common barrier to successful implementation of virtual classes especially in developing countries like Nepal (13).

The next feature termed "reduces travel necessity" also has the highest rating in the domain "synchrony". Virtual learning has ensured the possibility of 'emergency remote learning' (21) wherein students can reap the benefits of teaching-learning activities without having to deal with the inconvenience of travel restrictions. In contrast, this feature has led to a reduction in classroom size because of voluntary attendance in virtual classrooms. Limited Internet bandwidth was the most frequent excuse for student absences as explained by participants during FGD. Moreover, the feasibility of virtual classroom has been reported by students in several studies (10, 12, 15, 17).

In this study, the domain "synchrony" has the lowest mean score as rated by the students. It illustrates that students have perceived "lack of interaction" as a feature of virtual classrooms. The featured statements "easy to follow class discussion" and "virtual educator frequently attempted to elicit student interaction" were rated at lower levels. The literature indicates that in a virtual classroom both student and educator may act as facilitators to each other and that active interaction plays a vital role (22). The students

Table 3. Correlation of study variables

Variables	1	2	3	4
Course interaction	-	-	-	-
Synchrony	1.00**	-	-	-
Usefulness & ease of use	0.22**	0.22**	-	-
Sense of community	0.09*	0.09*	0.52**	-

*Correlation significant at 0.05 levels (two-tailed); **Correlation significant at 0.01 level (two-tailed)

Table 4. Narrative thematic analysis of discussion transcripts

Transcript passage	Initial code	Theme
Moderator: "Tell me about your initial reaction to your suspended classes being resumed in the form of a virtual classroom?"		
Student: "I was very excited at first but also a little anxious. I had a secondhand knowledge of virtual classes from my friends studying abroad. I even started discussing about how it will be conducted with my peers. On one hand, I was delighted to be experiencing something new and on the other, apprehensive that it will be nothing like I imagined."	1. Excitement and apprehension	1. Initial response to virtual classroom
Moderator: "What challenges did you face in virtual classroom?"		
Student: "I believe I am speaking for everyone when I say this, that technical challenges are the main problem we face in virtual classroom. I missed some classes due to poor internet connection. We do not have access to archived classes and that makes matter even worse. It may sound like a great way to learn from the comfort of your home but there are just too many distractions."	2. Technical challenges 3. Distractions at home	2,3 Challenges of virtual learning
Moderator: "How do you compare physical or virtual class?"		
Student: "I prefer physical classroom over virtual because I felt virtual classroom lacked engagement and participation of the students. The lectures are restricted to only one-way communication where teachers speak and students listen. It becomes monotonous and impersonal. In previous years, we would have lectures alongside practical implementation of theoretical knowledge. That makes it easier for us to memorize and understand the materials being taught. I believe there is simply an absence of connection between the educator and the learner."	4. Restricted to one-way communication 5. Lack of connection 6. Flexibility of time 7. Online access to study material	4,5,6,7 Advantages and disadvantages of virtual classes or physical one
Student: "My personal view is that virtual lessons are quite adjustable with time with no restrictions on getting late to the class. Moreover, I found it extremely convenient to learn from the comfort of my home. At one time, I wasn't feeling well but I could still attend the class. I would not have been able to attend the lectures if it were a physical one. I can also pull up educational materials from various online sources alongside the lectures, making it more discernible. My overall experience of virtual learning is vastly satisfying."		
Moderator: "Do you recommend physical, virtual or blended classes in the future?"		
Student: "If the option were given for physical, virtual or blended classroom, I would primarily opt for physical class, as I believe nothing can replace it especially in medical studies. However, use of multimedia resources like video, audio, quizzes etc. for making the learning process engaging in virtual class, blended classroom will provide substantial collaboration with the educator along with the possibility of increased access to course material online."	8. Use of multimedia resources in blended classroom 9. Increased access to course material	8,9 Preference of blended classroom in future

Bolded statements indicate passage for initial code

Table 5. Triangulation of the data

Domain	Triangulation concept	Survey response N=737	FGD response N=14
Course interaction	Student and teacher as a facilitator to each other	2.93±0.81	Lack of interaction
Synchrony	Limitations with Remote learning	4.10**±0.47**	Technical challenges and distraction at home
Usefulness and ease of use	Advantage and disadvantages	3.09**±0.82**	Lack of access to study material but time flexibility
Sense of community	Physical Separation from peers	3.06**±0.79**	Limited collaboration with peers

maintained that a virtual class was the only mode of interaction with their classmates and educators during the present crisis. They recommended that a virtual learning pattern should be structured with a different delivery approach. Virtual educators should adopt an innovative method of delivering lectures (text and verbal chats, polling, and raising hands, as well as feedback sessions) (15) rather than merely rolling on with the slides prepared to make the class further interactive. Classroom interactions were the least experienced feature in virtual classrooms.

Traditionally, virtual learning has suffered from a lack of interactivity compared to face-to-face learning, which is associated with social presence, social interaction and student interaction with peers and educators. As demand for the virtual classroom has grown dramatically, educators need to be competent in their new role as a virtual educator. They need to equip themselves with the skills required for a smooth transition in teaching and learning activities. A good virtual educator has to facilitate, connect, lead and work in synchrony with students to create a positive learning experience and ensure students' progress in their academic endeavors. According to the students, virtual educators require a series of technological, affective and communicative skills to run and adjust in the innovative pedagogical structure (23).

Usefulness and ease of use is the degree to which the users believe a certain application or system is easier to use with advantage (24). Regarding the third domain, "usefulness and ease at use", the students had positively recognized that archived classes can be accessed if missed. This finding is in contrast with the students' experience. In the focus group discussion, the students explained that they never had access to archived classes and were never informed by educators that this feature is also available. Drawing on available literature, archived material provides alternatives for content delivery to those students who face bandwidth limitations and technical problems during live session, but it should not act as a means of escaping from regular live sessions (25).

The fourth domain, "sense of community", was perceived well as a feature of virtual classroom. Further, focus group discussion explored that physical separation in present situation can lead to a decline in the sense of community among the students. The reduced sense of community may contribute to higher rates of dropout and absenteeism (26). Based on their experiences of virtual classroom, the students reported a wide range of challenges including the lack of interaction, effect of classroom size, limited Internet bandwidth and lack of skills among educators. Similar results were reported in another study (27). Nevertheless, student's motivation and consistency in the classroom plays a vital role in successful implementation of the virtual classroom (28). Students in the focus group discussion reported that they preferred blended learning to merely virtual or physical courses. They believed that blended learning allows them to study in a virtual world while maintaining their attachment to the education culture with

which they are acquainted. Implementing virtual learning in mainstream education must be backed by quality standards, along with technological advancement. Emphasis should be placed on empowering and capacitating human resources in acquiring technical and managerial skills required to conduct a virtual classroom.

Emergence of virtual learning is an important opportunity for Nepalese education to raise its level in accordance with global trends. Despite various obstacles, the transition from traditional to virtual classrooms has been perceived by students in a positive and enthusiastic way. The results of focus group discussion revealed that interactions were much lower in virtual classes and there was a great variation between the students' perception and their experiences of virtual classrooms. Virtual educators need to modify their instruction practices and students should adopt a more consistent attitude to make virtual learning more effective. In this context, medical universities have to formulate an "umbrella education" policy to create a mainstream education framework that is accessible to everyone. Given that blended learning was highly favored by the students, it is imperative for medical universities to work out and finalize a relevant teaching and learning strategy that could potentially transform medical education in the days to come.

Limitations

Selection bias should be considered, as those students without access to the link were not included in this study due to weak snowball effect. Chain referral (Peer Esteem Snowballing) technique was the only possible means to reach the potential respondents as all campuses were closed due to the nationwide lockdown. Consideration of respondent bias should also be contemplated, as survey data were collected from student self-reports based on a subjective scale. Some misunderstanding and/or misinterpretation of the elements may have still occurred while analyzing the findings of the focus group discussion.

Ethical Considerations

Approval for conducting the study was obtained from the Institutional Review Committee (Ref: F-NMC/507/076/077) of National Medical College. Informed digital consent was obtained from the participants. The study could only proceed further once the participants agreed to participate by clicking on the "Yes" button. To maintain confidentiality, the data was not personalized. Obtained data was only used for the present study and will not be used for any other purpose. During focus group discussion, students were told that they were not required to keep their videos on or log in with their formal names. Informed digital, verbal and written consent was obtained from the participants before the Zoom meeting begun. Students were notified that the discussion was going to be recorded and were assured that data will remain confidential, only to be used for present research.

Authors' Contributions

Principal author conceptualized the paper and wrote the first draft. All authors critically reviewed and revised the draft and agreed on the final version of the manuscript.

Conflict of Interest

The authors declare that they have no conflict of interests.

Acknowledgments

We would like to express sincere gratitude to all the participants who voluntarily participated in the study. We are equally thankful to the early seed members of the study who actively participated and cooperated throughout the quantitative and qualitative phase of this study. We would like to acknowledge Dr. Michael A. Parker & Dr. Florence Martin for providing consent to use their tool and supporting us during the planning phase of the present study. Also, heartfelt gratitude goes to Ms. Jennifer Nelson for revising the manuscript as a native English speaker so as to ascertain linguistic and semantic appropriateness.

Funding/Support

No outside funding/support was provided for this study.

References

1 World Health Organization. COVID 19 Public Health Emergency of International Concern (PHEIC). Global research and innovation forum: towards a research roadmap. Available from: https://www.who.int/publications/m/item/covid-19-public-health-emergency-of-international-concern--global-research-and-innovation-forum [Accessed: 10th June 2020].

2 Al Jazeera. Coronavirus: travel restrictions, border shutdowns by country. Coronavirus pandemic News. June 3 2020. Available from: https://www.aljazeera.com/news/2020/03/coronavirus-travel-restrictions-border-shutdowns-country-200318091505922.html [Accessed: 10th June 2020].

3 Nicola M, Alsafi Z, Sohrabi C, Kerwan A, Al-Jabir A, Iosifidis C, Agha M, Agha R. The socio-economic implications of the coronavirus pandemic (COVID-19): A review. International Journal of Surgery. 2020; 78:185-93. doi: 10.1016/j.ijsu.2020.04.018

4 UNESCO U. COVID-19 educational disruption and response. UNESCO. 2020 Mar 4. Available from: https://en.unesco.org/news/covid-19-educational-disruption-and-response [Accessed: 10th June 2020].

5 MyRepublica. Govt takes sweeping measures to contain spread of covid-19. 2020 Mar 19. Available from: https://myrepublica.nagariknetwork.com/news/govt-takes-sweeping-measures-to-contain-spread-of-covid-19 [Accessed: 13th June 2020].

6 Poudel A. After second COVID-19 death, government extends lockdown to June 2. The Kathmandu Post. 2020 May 24. Available from: https://kathmandupost.com/national/2020/05/17/government-extends-nationwide-lockdown-until-june-2 [Accessed: 13th June 2020].

7 Paudel N: TU doing homework to overcome barriers to online teaching. The Rising Nepal Daily. 2020 April 26. Available from: https://risingnepaldaily.com/nation/tu-doing-homework-to-overcome-barriers-to-online-teaching [Accessed: 10th June 2020]

8 Dawadi S, Giri R, Simkhada P. Impact of COVID-19 on the Education Sector in Nepal-Challenges and Coping Strategies. Sage Submissions. Preprint. doi:10.31124/advance. 2020 May 21;12344336:v1.

9 Allen IE, Seaman J. Entering the Mainstream: The Quality and Extent of Online Education in the United States, 2003 and 2004. Sloan Consortium. PO Box 1238, Newburyport, MA 01950; 2004 Nov.

10 Gedera D. Students' experiences of learning in a virtual classroom: An Activity Theory perspective. International Journal of Education and Development using ICT. 2014 Dec 31;10(4).

11 Yilmaz O. The Effects of" Live Virtual Classroom" on Students' Achievement and Students' Opinions about" Live Virtual Classroom" at Distance Education. Turkish Online Journal of Educational Technology-TOJET. 2015 Jan;14(1):108-15.

12 Pangeni SK. Open and Distance Learning: Cultural Practices in Nepal. European Journal of Open, Distance and E-Learning. 2017, 19:32-45. Doi: 10.1515/eurodl-2016-0006

13 Ashis S. Challenges in establishing virtual class room: an experience from a low middle income country medical university. Journal of Patan Academy of Health Sciences. 2019Jun, 6:6-7. doi: 10.3126/jpahs.v7i3.33737

14 Arbaugh JB. Virtual classroom versus Physical Classroom: An Exploratory Study of Class Discussion Patterns and Student Learning in an Asynchronous Internet-Based MBA course. Journal of Management Education. 2000, 24:213-33. doi: 10.1177/105256290002400206

15 Parker MA, Martin F. Using virtual classrooms: Student perceptions of

features and characteristics in an online and a blended Course. MERLOT Journal of Online Learning and Teaching. 2010, 6:135-47.

16 Sandars J, Correia R, Dankbaar M, de Jong P, Goh PS, Hege I, Masters K, Oh SY, Patel R, Premkumar K, Webb A. Twelve tips for rapidly migrating to online learning during the COVID-19 pandemic. MedEdPublish. 2020 Apr 29;9. doi: 10.5116/ijme.5f20.55f2

17 Cecilio-Fernandes D, Parisi MC, Santos TM, Sandars J. The COVID-19 pandemic and the challenge of using technology for medical education in low and middle income countries. MedEdPublish. 2020 Apr 23;9. doi: 10.15694/mep.2020.000074.1

18 Creswell JW, Plano Clark VL. Designing and conducting mixed methods research.2. Los Angeles. SAGE. 2011.

19 Polit DF, Beck CT. Nursing Research. 9th edition. New Delhi. Wolters Kluwer Health I Lippincott Williams & Wilkins, 2012.

20 Nunnaly J. Psychometric Theory. New York: McGraw Hill. 1978.

21 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. doi:10.12669/pjms.36.COVID19-S4.2785

22 Khan BH. Discussion of resources and attributes of the web for the creation of meaningful learning environments. CyberPyschology & Behavior. 2000, 3:17-23. doi: 10.1089/109493100316193

23 Ng YF, Chan KK, Lei H, Mok P, Leung SY. Pedagogy and innovation in science education: A Case study of an experiential learning science undergraduate course. The. European Journal of Social and Behavioral sciences. 2019:2910-26. doi: 10.15405/ejsbs.254

24 Davis FD. Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly. 1989:319-40. doi: 10.2307/249008

25 Al-Nuaim HA. The Use of Virtual Classrooms in E-learning: a case study in King Abdul-Aziz University, Saudi Arabia. E-Learning and. Digital Media. 2012, 9:211-22. doi: 10.2307/249008

26 Rovai AP. Building Sense of Community at a Distance. International Review of Research in Open and Distance Learning. 2002;3(1). doi: 10.19173/249008/irr0dl.v3i1.79

27 Nicolaides A. Innovative teaching and learning methodologies for higher education institutions. Education Research. 2012, 3:620-6. doi: 10.9790/487X-1907028892

28 Sinan K, Hall Y. Factors Affecting Students preferences for Online and Blended Learning. Motivational vs. Cognitive. European Journal of Open, Distance and E-Learning. 2019, 22:71-85. doi: 10.2478/eurodl-2019-0011