Exploring the Use of Educational Technology to Motivate Undergraduate Nursing Students' Learning at Tertiary Level in Pakistan

Mariam Farooq[1], Sarwat Nauman[2]

Abstract

Technology has become an important part of nursing students, and its infusion with education is therefore inevitable. This research is one of the few researches that explored the implementation of digital technologies in the context of a Pakistani nursing school. The research in the field of nurse education is scarce with reference to Pakistan and this research aimed to fill the existing gap in the literature. This article aimed to explore the views of nursing students toward the implementation of digital technologies in class. The study applied a qualitative exploratory approach method with the case study as a research design. A purposive sampling technique was applied by selecting Year III and IV students of the nursing programme. The data for this study were collected through students' focus group discussions, class observations and analysis of students' online work on the virtual learning environment. The findings indicated that students feel motivated in using different digital tools for their face-to-face classes. However, they also believed that more could be done in handling the issues they faced in using technology for their classes**.** It is therefore recommended to train teachers well and universities should use their funds for providing high-speed and stable Internet connection to students on campus.

Keywords: *digital technologies, higher education, learning motivation, nursing students' perceptions, obstacles*

1. Introduction

In today's world, most learners are Generation Z students and have seen a rapid change in how technology was initially introduced and has been used in their studies. With time, new digital technologies have emerged for various purposes and the use of different technologies in learning not only allows learners to rapidly master new abilities through exposure to a variety of new devices, but also the enthusiasm that comes with these new tools motivates learners to learn. Therefore, the generation of students have a preference for

[1] Specialist, Aga Khan University, Karachi, Sindh, Email: farooq.mariam@aku.edu

[2] Associate Professor, Institute of Business Management, Karachi, Sindh
Email: sarwat.nauman@iobm.edu.pk

digital literacy and that technology has helped them engage in the learning process (Huddle, 2019). The role of technology in education is fourfold: it is used as a part of the curriculum, as an instructional delivery method, as a means of assisting with instructions, and as a tool to improve the overall students' learning process (Elzarka, 2012).

According to studies on how learners choose to utilize technologies and how it influences their learning, students' learning and interactivity improve when they use modern platforms, technology, and software (Raja & Nagasubramani, 2018). Through its use, information transfer becomes extremely simple, convenient, and effective. In the nursing sector, technology has become an integral part of a nurse's practice. It is important to integrate technology into the nursing curriculum for nurses to provide safe patient care. Learning management systems, online conferencing, podcasts, vodcasts, virtual worlds, gaming, simulation, and mobile technologies are possible examples of technology used in nursing education (Revell & McCurry, 2010). There is even a separate course on technology that nursing schools offer where nurse educators teach their students about the foundations and ability to appropriately utilize technology before graduating (Williamson & Muckle, 2018). Technology also allows students to get acquainted with clinical situations they would normally not encounter in their practice and this helps to bridge the difference between theory and practice. O'Leary (2014) further stated that with technology, reality can be added to situations and conventional case studies can be made more practical for students.

Digital technologies are spreading throughout the world faster than previously known. This includes using technology in developing countries where an improvement has been noticed in recent years. However, working in the Pakistani context helped the researcher realise that technology is still not sufficiently used for educational purposes. One explanation for this is that in Pakistani context, there are challenges related to the lack of available resources and teacher training that result in teachers not embracing fully the use of technology (Kurji et al., 2015). This can result in a gap between what students want and the kind of learning platforms available to them. This may become a problem as students can lose interest in their studies and might not pay attention in class, which might hamper their learning process. Moreover, students may even lag behind and encounter challenges while using online platforms and this may even have an impact on them later in their lives when they are required to demonstrate good digital skills at their workplace. Therefore, the main purpose of this study was to gain an understanding of the experiences, attitudes and

motivation of Pakistani nursing students towards learning with the help of different technologies in face-to-face classes in a private university of Karachi.

1.2 Objectives of the Study

The objectives of this study were to:

1. Explore how different forms of technology were used in nursing face-to-face classes.
2. Explore the viewpoints and attitudes of nursing students towards using technology for their studies**.**

1.3 Research Questions

In order for this study to be developed and its objectives accomplished, the following research questions were expected to guide the investigation:

1. How is educational technology currently being used in nursing classes?
2. What are the views and attitudes of nursing students towards using technology for their studies?

a) What aspects of educational technology do the students like the most and least?

b) What are the obstacles that the students face in using technology in their classes?

1.4 Significance of the Study

This study highlights some of the ways through which digital technology is used in the nursing classes and thus is very significant. This research explored different aspects of technology that students like and dislike together with the challenges they face in using it. The findings of this study may help educators in improving their content and teaching pedagogy and assessment strategies while using technology in their courses. Having said that, this research wills open doors for other universities where technology is not being used to its full potential. Hence, policy makers may learn from it and set policies and guidelines for the successful integration of digital technology into their educational programmes.

On the other hand, it is also hoped that this research will be beneficial to future researchers and may serve as a reference for future studies to explore and relate the use of connectivism theory from the particular context of nursing education in Pakistan.

2. Literature Review

This section included related literature on Connectivism, educational technology, and learning motivation that is relevant to understanding the underpinnings of this research.

Using technology in learning has revolutionized traditional learning theories into technology-integrated ones like web-based and internet-based learning (Sahin, 2012). Connectivism is a theoretical framework that explains

how people learn. In this theory, the point of departure for learning occurs when knowledge is produced when a learner communicates with others and feed that information into a learning community (Downes, 2008). To further elaborate on this, Siemens (2008b) stated that a community of learners with similar interests share information via interaction, dialoguing, and thinking together.

Connectivism offers ways for students to make decisions about their learning from a learner-centered teaching viewpoint (Siemens, 2008b). Thus, student autonomy in their work can create a higher sense of ownership. According to connectivism, students become active members of learning communities, bringing in their own social context and committing themselves to the whole learning process. The application for learners is that they should be asked to use an open and free landscape that helps create new content. This can take place in the context of this research, where nursing students need to discuss different real-life cases in groups and can use online digital networks such as online forums on the Virtual Learning Environment platform to discuss and become more active participants in the learning process (Utecht & Keller, 2019). The discussions and connections students will form via technology would move towards the theory of connectivism.

In today's connected environment, creating situations in which students follow ties between various ideas and then construct a new interpretation from them implies yet another important ability (Utecht & Keller, 2019). Siemens (2008b) believed that the design of learning spaces or modes should allow learners to build connections freely and explore areas of interest and be balanced with curricular needs. He further added that education is very holistic, and thus, providing learners a space for exploration and matching the needs of institutions is essential for the whole to work together. Additionally, in a connective learning environment, learners are not passive recipients but are required to further share their knowledge and opinions with peers. Thus, the knowledge is not held by a single learner; it is also co-created and shared between peers.

However, while the Internet has created the possibility of a linked, collaborative learning environment, many academic institutions still do not fully take full advantage of the value of this connectedness, and this needs to be looked at for students to flourish in a digital era. The same is the case in Pakistan, where connectivism still needs to be applied in higher education contexts in its true sense. The question that arises from its application is how a connectivist perspective can be combined with technology adoption and the possible characteristics and value of designing learning activities grounded in Connectivism (Kizito, 2016).

According to Ball and Levy (as cited in Alharbi & Drew, 2014), modern electronic technology can be used to considerably improve education and student success when applied to educational settings. Educational technology is a method of using existing technology to improve the quality of education in a systematic and coordinated manner. It is a systematic approach to conceptualizing, executing, and evaluating the educational process via learning (Stosic, 2015).

The usage of computers in Pakistan's higher education system has dramatically increased in the last decade (Rahim, 2020). A study conducted by Jamil et al. (2016) suggested that nursing students are ready to use e-learning and recognise its uses in education. The latest educational policy of Pakistan has also given importance to using technology in education. For this, the curriculum papers have recommended facilitators to integrate different technology in their classrooms (Khokhar & Javaid, 2016). Although many universities in Pakistan today are privileged to provide an Internet connection to faculty and students and access to computer labs, technology usage in class is still very low. This mainly included using PowerPoint and multimedia by teachers in the class.

Making the right use of technology in allowing students the freedom to discover solutions to problems both independently and collaboratively is the power for productive learning. In more nursing programmes now, learners are expected to focus on solving issues in groups, analysing different cases, and discussing higher-level questions about nursing. They need to develop different podcasts, vodcasts and digital stories of their nursing cases, get a flavour of virtual simulation, online quizzes and video conferencing (Oermann, 2015). A study conducted by Mannisto et al. (2019) found that in terms of learning outcomes, interactive digital learning can be an efficient technique in nursing education. In the field of nursing, encouraging collaborative group work, the students in the research had greater satisfaction. Also, rather than learning facts during the learning process, students can learn by doing things and this can include simply taking interactive quizzes or participating in technology-enabled group discussions, or playing educational games related to the nursing field. Furthermore, in such situations, the feedback is almost instant and research suggested that feedback is most useful when it is immediate and links success with efforts. This increases students' self-efficacy, enhances interest and persistence, and increases intrinsic motivation (Washington, 2017).

The perspective of the classroom setting must shift to become more learner-centered to ensure productive learning for students to take place. This can be done where students and teachers come into a collaborative relationship with technology to build a 'community' and an environment that promotes and embraces the learning process (Abdelmalak & Trespalacios, 2013). This can be

done by using the technology of different forms or having various platforms such as the learning management system, computer labs, smart boards, and using mobiles for quizzes and other educational activities. In higher education, students' willingness to do certain tasks and motivation play a very important role in succeeding academically. Student motivation is an important focus of research in education. Student learning motivation can be divided into intrinsic and external motivation and the most basic distinction between the two is that intrinsic motivation refers to doing something because it is intrinsically interesting or fun and evokes feelings of achievement. While extrinsic motivation refers to an act being carried out because it leads to a distinct result of obtaining an award or avoiding some punishment, thus, the focus is on results (Nukpe, 2012).

Dhanda (2015), in his study, explained how students are motivated both intrinsically and extrinsically by using technology for educational purposes. The study concluded that it depends on students' preference as to whether they favour using technology due to the satisfaction and sense of accomplishment they receive in working with it, or immediate feedback that increases their motivation to use it.

A study conducted by Francis (2017) explored the influence of technology on students' motivation and engagement in classroom-based learning. The results showed that 348 students were inspired by using technology in the classroom. This included the technology that surrounded the students in their daily lives and is quick and easy to access, such as a computer at home or a cell phone in their pocket. This means that students are excited and motivated to learn, leading to better engagement in learning activities when technologies that they are familiar with are used in the learning process.

For learning environment and motivation, the right environment for students' learning must be made available. A study conducted by Amir and Kamal (2011) analysed different motivating learning techniques of Pakistani students in higher education. The results suggested that teachers must design their courses and use teaching methods and tools in an environment, which will encourage students to use their talents and abilities with complete confidence. Thus, it is important that the right learning environment is provided to students to flourish.

However, at times institutional culture acts as a stumbling block to promoting and maintaining motivation. According to numerous researches, institutions with a stable and robust culture can provide a number of benefits, including encouragement and inspiration (Abad-Segura et al., 2020). In Pakistan, there is dire need to build a culture in institutions where technology use is

encouraged. This includes providing support by the management in order to use technology effectively in the learning process. As mentioned, Connectivism theory explains how Internet technologies create different opportunities for people to learn. It is the theory for the digital age and allows learning to take place when knowledge is passed on through the process of learners communicating and supplying information to a community of learners. In connectivism, the knowledge is disseminated via an information network and kept in different digital formats. The technological tools and media are used to assist learners in their learning process and this is applicable in this study context, too, where through different online digital networks, the nursing students can learn from social interaction and collaboration. Hence, connectivism theory, with the help of other technologies, if used properly in classes, can assist the learning process of students.

Figure 1

Conceptual Framework for Improving Student Learning Motivation through the Use of Educational Technology

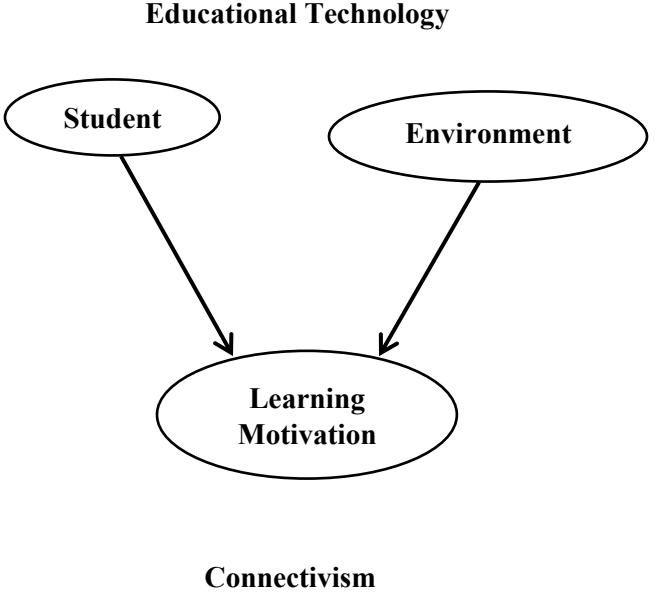

Figure 1 is a visual representation that demonstrates the conceptual framework of this study while keeping all substantial factors into consideration in finding out

nursing students' experiences and perceptions about using technology through meaningful activities that provide them with new experiences of learning.

3. Research Methodology

3.1 Research Design

Within the qualitative research paradigm, this study has used an exploratory case study research design. Case studies are in-depth investigations of a single person case, group, event, or community within the context of real life (the case is studied holistically in their natural environment) through various data sources (Merriam & Tisdell, 2015). This guarantees that the topic or scenario is not examined through a single lens, but rather through a range of lenses, allowing for the discovery and understanding of numerous aspects of the phenomena. For this research, a case study design was most appropriate as the emphasis was upon an intensive examination of the setting, and that was how digital technology is used in the nursing face-to-face classrooms of the Aga Khan University.

3.2 Sample and Sampling Technique

In this study, a purposive sampling technique was used as it targeted Year III and IV nursing students of a private health-sciences university in Karachi. These students have been using different technology tools for a while, and thus have more knowledge and experience (Punch, 2006). The sample size of this study consisted of 64 students. These students were divided into eight focus group discussions (consisting of 8 students in each group) as there were four sections in Year III and IV of the nursing programme. The total strength of Year III was 160 students and 150 of Year IV. Additionally, the selection also depended on students' availability and consent. Then, the classroom observations of all Year III and IV classes were also conducted to get a better idea of how technology was practically integrated in these classes.

3.3 Instrumentation and Data Collection

In a case study, the best way to gather data is through multiple methods as this improves the validity of the study by increasing the accuracy of its findings (Yin, 2011). Focus group discussions, class observations and students' online work was used to gather the data for this study.

3.3.1 Focus Group Discussions

In this study, there were eight 70 to 90 minutes focus group discussions. These consisted of four groups of Year III and four groups of Year IV nursing students. Each group had 8 students in it and in total 64 students participated in this study. The selection of participants depended on the availability of nurse students as they had clinical rounds at the hospital on certain days and thus this had to be on a voluntary basis. In total, there were four sections in Year III and IV of the nursing programme and thus the focus groups were formed by catering

each section of Year III and IV. A semi-structured interview guide was developed prior the discussions. The questions began with finding out about general experiences and progressed to specific questions while keeping the research questions in mind.

3.3.2 Observations

In this study, eight face-to-face class observations took place as per teachers' convenience where the way teachers used technology and students' level of involvement in completing class activities via technology was observed and evaluated. For these observations, field notes and an observation sheet were used to record the data. The observation sheet was developed by keeping the literature review in mind and was verified by two educational technology experts.

3.3.3 Document Analysis

The information about students' online work consisted of the tasks they completed and submissions they provided on the Virtual Learning Environment (VLE) platform. This included students' posts in discussion forums, Padlet, reflections, assignments, teachers' feedback and resubmissions. The VLE course sites were analysed for all the eight classes. A rubric was used to analyse the quality of data. This provided the researcher with information about students' online activities they generally took interest in and which activities they least preferred doing. This information was crucial to compare it with the results yielded from the focus group discussions.

4. Data Analysis and Interpretation

Discussions with the students helped to analyse the descriptive data. As per Braun and Clarke (2005), deductive codes (also known as anchor codes) were first formed by placing labels in the research questions. Second, pertinent statements were coded, and the inductive codes were placed under the deductive codes. After that, a list of initial codes were compiled, followed by grouping codes into their respective anchor codes. Using Saldana (2013), the codes were applied via axial coding. Next, each code was tallied for its frequency and categories were generated from the codes. In the last, the categories were examined to generate themes and these themes were then used to address the research questions. In addition to this, students' online participation on the VLE was also analysed in order to have a better grasp of their class performance and the quality of work they produce via using technology tools and/or platforms.

The following section is divided into three main areas, each with accordance to the research questions posed.

4.1 The Use of Technology in Face-to-face Classes

From class observations, it was noted that a PowerPoint presentation was used a lot in class. Moreover, the use of mobile phones was also permitted to help students take online surveys on Mentimeter and quizzes via Kahoot.

Then, the VLE platform was also used via a blended approach. This was also noticed in the document analysis of nursing course sites pre and during the pandemic where a vast difference was noticed in the way these course sites were developed and used. During the pre-pandemic time, the VLE course sites were used to upload class material and assignments and the discussion forums were hardly or minimally used. A reason for this was mentioned during the focus group discussions where a student explained,

"We don't use forums that much in blended courses as we see our classmates and teachers in the class, if there is any clarity that we want, we can have it in class."

This showed that discussion forums were not given importance in blended courses as its objectives were already met in face-to-face classes. Students also talked about guest speakers from other countries like Canada and the UK joining them virtually for a session. Then there are also computer labs that students used to complete tasks assigned by teachers during class time.

4.2 Attitudes towards Using Technology in Face-to-face Classes

A majority of third and fourth-year nursing students were of the view that technology helps them learn better in a class and for this, a student in the focus group discussion stated that,

"I learn more where technology is used because in a typical PowerPoint you are not engaged. You learn and remember more when you do something via your phone or laptop or do research and then try to prepare a presentation in the class."

It can be concluded from the above example that students prioritise technology-based activities, which increase their class engagement. This was also clearly evident in class observations where students were well engaged and attentive while using technology in their lessons.

Additionally, it was also evident from class observations that students like applications such as Kahoot, Mentimeter and Padlet. They seemed excited since these tools allow them to interact (student-to-student interaction) and socialise with each other, and most importantly the feedback or results are displayed instantly. For example, a student commented that,

"We like these apps because all students are involved in this, we can easily look at the results. We like competitions and students take such tasks seriously."

Another student shared his experience by saying,

"With Mentimeter, we can provide feedback or take surveys online. The results are displayed instantly and we do not need to wait."

Therefore, there seems to be a demand for e-learning environments that are interactive, game-based, and provide instant feedback to students.

Another important aspect that applications like Kahoot cover is formative assessment and tracking class progress. Students are more aware of what they have learned and still need to learn in class. A student stated that,

"In our Science class, the teacher uses Kahoot to do a recap. And if we are unable to understand anything then the teacher explains the concepts afterwards."

Technology also provides students with equal opportunities to participate and it helps those who are not very vocal in class. This point was mentioned by a few students in focus group discussions where one student shared that,

"I am quite happy with Padlet where you can add your comments. Like in a face-to-face class, the teacher cannot take everyone's response. So through these tools, people who are shy or hesitate to speak can also participate. It is fair as well (smiles)."

Then, the opportunity to think before posting a response on a virtual wall was also preferred by students,

"With Padlet, we get some time to think before posting our opinion in class. We can delete our answers or correct our mistakes if we see them, so Padlet is most useful in that manner."

The students were also asked about the likeability factor of using technology and for this, a majority of students talked about the usefulness and ease of using a particular application or tool. For example, one student commented,

"I think likeableness increases when a tool is user-friendly because sometimes there are apps that people don't know how to operate and it wastes our time."

From face-to-face class observations, the researcher wanted to know how students felt about pairing up or working in groups while using technology. There was a mixed reaction as some favoured it while others had reservations as mentioned,

"Pairing up is a good thing as we learn from each other and share our ideas. We share our responsibilities like one person does the searching on the mobile or laptop and then others help too."

"Ma'am, the problem occurs when you get a pair or group members who don't want to work and you land up doing everything. We are not able to say openly to each other how we feel"

The students also preferred watching videos in class as a student replied,

"We like videos as we get the real picture of our nursing concepts. It is not possible to go to the hospital all the time." Another student mentioned, *"We like videos as we can watch them again after class if we don't understand anything the first time."*

Lastly, there was also a discussion about inviting guest speakers virtually to classes, and students strongly favoured this. A student shared her opinion by saying,

"We have faculty joining us from Canada or other places. They share their life experiences, so it is very motivational for us."

The above example demonstrates that technology positively impacts students' motivation where it enables them to socialize and have access to other professionals' perspectives and engages in dialogue. Thus, helping students to bridge a global gap.

Students were also asked about technologies that should be avoided in face-to-face classes and a majority of them did not favour the use of PowerPoint as students consider them traditional and prefer having engaging content.

4.3 Obstacles in Face-to-face Classes

A common challenge that students faced in their class were the time when a computer did not support the programme they wanted to play. A student said,

"Once, I wasn't able to play my audio recorded voice notes in class as something was wrong with computer. Ma'am called admin person who fixed the issue but it took 15 minutes of class time."

Thus, the students claimed that using ICT in class was not free of risks. Additionally, some students talked about mobile phones not supporting a particular app. A student commented that,

"There are some students who do not have smart mobiles. Then, the teachers have some backup plans for them. The teachers had the same thing printed out on paper."

This was very evident from class observations as there were 2-3 students in the class who could not take the online surveys and were given a printed version of it. However, the students did not complain about the university's Internet connection as it is stable most of the time of the day.

5. Discussion and Conclusion

The first research question dealt with using different digital technologies in face-to-face classes. The findings highlighted that the use of different types of digital technologies is encouraged by the university and teachers try to use different forms of technology in their classes. This is in line with the government of Pakistan's most recent educational policy, which emphasizes the use of ICT in education (Khokhar & Javaid, 2016).

A majority of the students stated that technology should be simple and easy to use to communicate with other students. They also indicated that they want to use technology in order to advance their knowledge and be at the same level as students in other countries. To this, Ghavifekr and Rosdy (2015) mentioned making the learning process for students more fulfilling and meaningful and for this educational institutions are advised to prepare students to live in a "knowledge society" where they need to consider ICT integration into their curriculum.

The second research question looked at students' views about using technology in class. It was evident from the results that students prefer using interactive and game/competition-based e-learning tools in their face-to-face classes. A reason for this is as Gokbulut (2020) explains that through e-learning environments, equal opportunities are provided to students to participate in class where they can experiment and develop active groups of students who not only consume the information but also produce, modify, and create new data in the classroom.

The findings of this study indicated that students like applications that are easy to use, whether it is using their mobile phones in class for online activity or recording a presentation online on the VLE platform. A possible reason as mentioned by Daghan (2017), for this is because students like to use technology that facilitates their communication, and makes life and acquisition/sharing of information easier.

It was also found out that students favoured watching videos in classes rather than their teachers lecturing them. A reason for this is explained by Almurashi (2016), who said that students like the multimodal text in videos and believe that it helps them in understanding the lesson better and retaining the information longer. Furthermore, students also mentioned favouring videos as there is the element of live demonstration of different Nursing clinical scenarios and/or procedures presented by experts from different parts of the world, which students cannot attain all the time by going to the hospital side. Next, having virtual guest speakers also makes students excited as these are known to offer the possibility of enhancing student learning. From the findings and literature, it

became evident that students like to collaborate and hear experts that can expand their learning experiences and develop a wider understanding of their field (Zou et al., 2019).

However, students gave a mixed response to discussion forums that are used on the VLE platform with the prime purpose of allowing and promoting collaborative learning among students. For this, Aderibigbe et al. (2021) investigated factors that encourage and discourage student participation in forums and came to the view that clear instructions and encouragement from teachers serve as important elements to motivate students to participate, whereas, inadequate explanation and encouragement to do the task, and insufficient moderator participation demotivate students to participate.

In classes, technology integration does pose significant challenges to students. As per the findings of this study, there is uncertainty in using technology equipment in class, including computers or multimedia not working or a sudden disconnection in the Internet connection. Then there were also challenges as to how technology is adapted into the system and curricula.

This research can conclude that the effective use of digital learning tools in classrooms can increase students' motivation to learn more and should strive to build an environment that encourages students to learn via different ways. This is also supported by connectivism theory where educational technology manages processes and resources to help improve students' academic performance. Thus, the use of technology for learning purposes is the need of time as it has made itself a part of every aspect of our lives today.

6. Recommendations

In light of the research findings, the following recommendations are proposed for educators, researchers, universities leadership, department heads, and policymakers:

1. Teachers should think about using a variety of different and relevant forms of technology in class to make the learning process more engaging for students.
2. Online discussion forums need to be looked at again where students' learning experiences are appreciated and should give students the impression that it is a learning community forum where all the ideas are treasured and appreciated. Thus, teachers should show their presence regularly on online platforms by monitoring students' progress and responding to their queries or concerns.
3. Teachers need to be well-trained and support should be provided in using ICT tools in face-to-face classes. For this, in-house or external training should be provided to all educators with the help of department support.

4. Separate quality assurance standards and mechanisms should be set in where students' and teachers' views, classroom observations and assessment of VLE course sites are taken into account from time to time.
5. Universities should keep some funds aside for providing high-speed and stable Internet connection to students on campus.

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