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Challenges in establishing virtual class room: an experience from a low-middle income country medical university

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Virtual class room (VCR) is an online classroom which is conducted in real-time. Patan academy of health sciences (PAHS) has adopted this teaching method for the final year (year five) undergraduate medical students while they are posted to rural sites. Final year medical students have mandatory twenty weeks district (rural) hospital posting. Students go for the posting in two groups; the first group goes in the first half and the second group in the second half of the year. Each group is further divided into four sub groups. Each sub group is sent to a district hospital. So, there are four district hospitals: Hetauda, Gorkha, Ampipal and Gulmi which are 80 km, 140 km, 160 km and 370 km away from PAHS. This is in line with the mission and vision of PAHS to develop socially accountable graduates and contributing to rural health care. This VCR classroom is an opportunity to discuss social determinants of health, which can be best discussed while students are in rural community.

Academic activities and supervision are an important area that has to be addressed during the placement of students in the rural sites. So, the discussion and exploration of online teaching started in the year 2012. Field survey was done in the year 2013 to study the feasibility of internet connectivity, local support and the level of acceptance by hospital administration. Following this budgeting was done. The estimated budget was high for PAHS which was then a newly developing institution. So, only limited funding was approved by PAHS, the remaining required fund was supported by international donors. This funding was used to purchase and install hardware at all sites. However, the budget was not sufficient enough to bear the ongoing running cost. The VCR team thus had a challenge to balance the allocated budget and the outcome. So, despite of all these limitations, the VCR team decided to go ahead and thus Open Access System (OAS) was chosen in order to connect with the students. The team purchased locally available microphones and cameras. However, the internet bandwidth at the rural sites was not very good and reliable. There was a site where fiber internet connection was not possible due to its geographical location so, wireless point to point connection was achieved.

After installation of equipment, the biggest hurdle faced was the “echo” in the sound system. There was significant echo even after installing sound mixing devices. The sound mixing devices were very complicated for a medical student to use at those rural sites in the districts. Hiring a technical person at each site was not practical, logistically and financially. So, we started consulting national and international experts and went through different resources available on internet. To our dismay, even with all possible efforts we could not find any practically and financially applicable solutions. During this exploration, one of our experts said “keep on moving, technology will change over time, you will get the solution”, which was not only motivational but also an eye opening for the entire team.

So, we started with a protocol and a system where each site would take a turn to speak. The schedule was made before hand, and during discussion, if someone had to interfere, he or she would raise hand in front of camera and then take a turn to speak. We started, but the journey was not smooth, we struggled in and every step. It required intensive orientation to both the students and faculty as well. It was not like talking to person face to face. We moved on with this system in the first year and conducted forty sessions. We collected feedback from every session and tried to make small possible changes, like changing protocol, schedule, decrease resolution or turn off the video of the site which was not actively participating in the conversation during the classes.

Since we had problem with voice, in the second year we started brainstorming and came up with an idea of streaming voice through a social media application and video through our previous system. Voice call was free in that social media application but it did not have white board for discussion, so we streamed video through our previous system. It worked well, we had issues in video streaming but voice system worked well. We ran this system for next year and conducted 30 classes through this system. Though there were some positive changes, the sound system was still complicated, and we opted for a system of plug and play which was easier for the students. On the same run, we also explored software which had better option for sound and video control. We also explored camera as we were using regular desktop camera for the sessions, we realized that the interactions were limited due to this narrow angle camera and switched to cameras with wider angle. By this time better technologies had become available in the market, with much better internet bandwidth available at the cost of our old system. We had data to prove that we could make this work out. So, we applied for the fund one more time, and we got one international funding and plus our own institutional funding from PAHS.

In the year 2018, we replaced complex sound system with simple plug and play system, desktop camera with wide angle camera and a software which had more control over the video and audio system. At the same time, we also revised our checklist of preparation and closure, instructions to faculties and students and their feedback. Full audit cycle of this system was also conducted, now we have cut off value for audio and video system to monitor.

There were significant changes in the audio and video system which enhanced the interaction between students and faculties thereby increasing educational effectiveness. We conducted 30 classes using this technology in the year 2018 successfully.

After the hard work and experience of six years and running 110 sessions, we finally came to the conclusion that this system can be effectively used as a tool for teaching and learning activities in a low and middle-income country. Finally, though we are a low resource country with difficult working circumstances, we are not a resource nil country. Correct blending of technology with educational activity, patience to roll with technology and investing on it, on the basis of available data can help us make maximum use of resources at a reasonable investment.