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Research Article

Innovative Use of Sound Enhancer in Medical Education

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Abstract

Telecommunication is an integral part of today's world of scientific advancement. Advancements in telemedicine have come a long way, with use in teletherapy, research and imparting medical education. Simple and innovative ideas can be utilized in imparting medical education as part of telemedicine. The use of sound enhancer in medical education is a simple, novel method which has enabled medical students and fraternity in utilizing the boons of telemedicine. The present study utilizes the use of sound enhancer with mobile phone based videoconferencing in imparting medical education.

Keywords: Innovative; Sound enhancer; Medical education

Introduction

Telemedicine is the use of telecommunication and information technology to provide clinical health care from a distance. It has been used to overcome distance barriers and to improve access to medical services. Various modalities have been used in medical education. Telemedicine as a modality of imparting medical education has been in use in recent times to impart education to medical students and doctors in remote areas of the country, thus providing them the facility of interacting with national and international experts in the field of medicine. Branches like teleradiology, telepathology, telemonitoring, telesurgery, telerobotics have emerged in the recent times. Here we describe the use of a simple device in the form of a bamboo sound enhancer with mobile phone videoconferencing as part of telemedicine for educating medical students (Figure 1 and 2). Videoconferencing through mobile phones has been long in place but sound is not usually clear and loud in spite of keeping the device in maximum volume mode. To enhance the sound external power run speakers are used but an innovative indigenous method of enhancing sound without use of electricity is described here.

Materials and Methods

This study was conducted in the department of plastic surgery in a tertiary care centre during the period March 2019 to April 2019. Informed consent was taken from the participants. Bamboo sound enhancer was used in bed side clinics for medical students and teaching through videoconferencing was conducted by using mobile phone and bamboo sound enhancer enabling faculty from remote areas to participate in the teaching process. Classes were conducted bedside in plastic surgery ward and were attended by 6 students posted in plastic surgery as part of their clinical rotations. The sound enhancer was kept at the bedside of the patient with the mobile phone kept over it and the remote faculty participated in the clinical discussion using video conferencing enabling the students to participate with improved sound enhancements. The sound enhancer used was made of indigenous, cost-effective bamboo material and cost 350 Indian

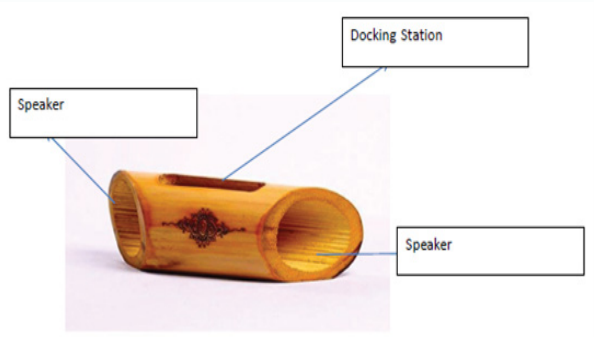

Figure 1: Showing Parts of bamboo sound enhancer.

Figure 2: Showing use of bamboo sound enhancer in medical education.

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Table 1: Details of Feedback

Question	Feedback from student 1	Feedback from student 2	Feedback from student 3	Feedback from student 4	Feedback from student 5	Feedback from student 6
Was the quality of sound better?	Yes	Yes	Yes	Yes	Yes	Yes
Were you able to utilise the expertise of remote faculty in your clinical discussions?	Yes	Yes	Yes	Yes	Yes	Yes
Did this enhance the experience of learning?	Yes	Yes	Yes	Yes	Yes	Yes
Did you find any limitations?	No	Yes	No	No	Yes	No
Would you recommend its use to your peers for medical education?	Yes	Yes	Yes	Yes	Yes	Yes

rupees. It is provided with a docking station for the mobile phone and hollow speakers on both the ends. The students listened to the teaching and clarified their doubts through telemedicine. Feedbacks were taken from them at the end of the classes and were included in the study.

Results

Table 1 describes the feedback received from 6 students who participated in the study. On the analysis of the feedback form it was found that use of Bamboo sound enhancers enabled the students too clearly and loudly hear the faculty teaching them over phone or participating in the clinical discussions thus enabling them to attain a better learning environment.

Discussion

Telemedicine is the use of electronic information to communicate technologies to provide and support healthcare when distant separates the participants [1]. The World Health Organization (WHO) defines Telemedicine as, "The delivery of healthcare services, where distance is a critical factor, by all healthcare professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation and for the continuing education of healthcare providers, all in the interests of advancing the health of individuals and their communities [2]. Telemedicine has variety of applications in patient care, education, research, administration and public health. To date medical education has not taken full advantage of advances in telehealth. Despite its impressive growth, information about this mode of healthcare delivery remains noticeably absent from the medical school curriculum. Traditional medical education consists of two components: Basic science and clinical education. Most medical students receive most of their first two years of training in classrooms, laboratories, with Standardized Patients (SPs), and through clinical encounters. Yet, telemedicine has the potential to transform professional health education at all levels. While the merger of telemedicine and medical education is in its infancy, there have been several experimental applications demonstrating a wide range of effects in terms of promoting the learner's knowledge, attitudes, skills and behaviors, as well as advancing patient care [3]. Various modalities of telemedicine are used ranging from conventional telephonic conversation, email, bulletin board, computer telephonic integration, telemonitoring and telecare and video conferencing. Technology enhanced learning has made many advances in the field of medical education over the past twenty years [4]. There has been the advent of e-learning, simulation, and multimedia resources to name but a few. Many of the advances made in technology enhanced learning, however, have followed traditional technologies in media and education [5,6].

Here we describe our experience with the use of bamboo enhancer in medical education. The sound enhancer acts as amplifier as well as stand for the phone. It is light weight and portable, easy to transport and no cords or cables or batteries required. The handmade sound enhancer enables you to share sound through passive sound amplification. It is incredibly durable, renewable and rich in tonal variation. The sound enhancer is made from eco-friendly and sustainable bamboo. Its 100% green and uses no electricity. It can be used for hands-free calls and Skype. It has an Anti-tilting inclined stand and precise mobile slot for minimum leakage. It is cost effective from prices ranging from 350 Indian Rupees to 550 Indian Rupees. Teleconferencing and video-conferencing can be done with enhanced sound using mobile phone and bamboo sound enhancer. This mode of telecommunication and telemedicine helps medical students in learning from remote faculties without the use of sophisticated technologies. It can also be used as a modality for music therapy for patients. There are certain limitations to the use of bamboo sound enhancer such as use in a noisy room may impair its sound clarity and loudness. Usually it can be used in phones with bottom speakers only and part of the mobile screen may not be visible after keeping the mobile on the stand, hence it may not provide very good video clarity compared to sound enhancement.

Conclusion

The use of bamboo sound enhancer is a simple, cost-effective, environmental friendly, sustainable method in imparting medical education to the students. Used as a type of telecommunication mode through mobile phone videoconferencing it helps in imparting education to remote areas by the distant faculty and it is an innovative approach towards telemedicine. The present study is a preliminary study and it requires randomized controlled multicentre trials with statistical analysis to further substantiate the role of bamboo sound enhancer in medical education.

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