

# Usages of Technology to Deliver Health Education Programs to Enhance the Health Status of Bangladesh

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## Abstract

Health education is a broad, multi-dimensional and well-discussed issue in developing countries. The ultimate goal of development is to improve the quality of life and to providing education for all. Bangladesh is a populated country and the number of qualified doctors is 53063, registered nurse 26899 and several thousand allied health professionals have been serving about 160 million people of Bangladesh. The doctor-population ratio is 1:4719 and nurse-population ratio is 1:8226. It is unfortunate that the formal health education system and existing manpower is not enough to provide health services to the large segment of population, particularly the poor and the deprived.

Long-term health manpower planning is lacking and manpower strength is inadequate in Bangladesh. Whereas, limitation of infrastructure and resources are an important problem for health educational program. It assumed that health education and family welfare makes important contribution to poverty alleviation, developed the individual and community's health status. Distance education and online learning is therefore, considered as supplementary, complementary, supportive and alternative to formal education. The nature of the information age and communication are changing rapidly. Interactive distance and online learning can reach more learners in more locations with fewer instructors. This paper focuses on health education program that is offering successfully by Bangladesh Open University (BOU) such as "Bachelor of Nursing Program" which has tremendous effort in the health sector of Bangladesh. Around 2000 nursing graduates from BOU have been engaged in teaching, policy-making and holding higher position in health sectors whom are contributing a lot to enhancing the health status of Bangladesh.

The success of nursing program encourages BOU to offer "Primary Health Care" and "Masters in Public Health" programs as well as delivering a "Non-Formal Health Education Program" by using technology/e-Learning to change the view of mass people concerning the several health issues.

**Keyword:** Health Status, ICT, Formal and Non-Formal health education, BOU.

## Introduction

Bangladesh is a low-middle income country with around 6% economic growth. It has around 160 million population where population density is 1,203 people per Km<sup>2</sup>. (<http://www.worldometers.info/world-population/bangladesh-population/> dated 26<sup>th</sup> Sep, 2015). It improved in many fields like in health sector, compulsory participation of girls in education, combating natural calamities, women empowerment, and rapid growth of internet connectivity and ICT etc. Bangladesh has been consistently improved in the education sector that reflect the status of mass literacy. Still we have the common situation like over population, low literacy rate, inadequate infrastructure, less number of resource personnel, and lack of awareness about health and nutrition.

Development of any country depends on its educated and skill manpower. To improve the development of the country there should need to be fulfill the fundamental needs like education, health, nutrition, housing, social welfare and to safeguard the environment for every citizen in time (Numan, 2001). It is proved that human resources development through education, better health and family welfare makes important contribution to poverty

alleviation. Female education, family planning and welfare services contribute to decline infant and maternal mortality that leads to improve the maternal and child health status.

In 2013, the World Health Organization estimates that the world will be short of 7.2 million health-care workers and it would be raised at 12.9 million by 2035 (WHO, 2013). There was also a huge shortage of public health professionals. Trained health care professionals like doctors, nurses, midwives, and community health workers, and policy makers leading and influencing health status which would enhance the countries development. If these situation is not addressed properly then these will have serious implications for the health of billions of people across the world.

Illiteracy and lack of infrastructure facilities minimize skill manpower and opportunity to take general education in traditional education system. Distance education is considered as possible alternative of expanding mass education in the shortest possible time. Where teaching learning takes place at a distance by the use of pre-prepared self-instructional materials (SIM). The SIM package is composed of variety of educational materials which includes print materials, audio-tapes, video-tapes, broadcasting radio and television program, combined with some face to face counseling and guidance and group learning (Numan and Kamrunnaher, 2011). Meanwhile, with the advancement of information communication technology (ICT), online learning might me another alternative system for the advance learners. The education scheme is designed to meet the varied requirement of the learners as to what, where, when and how to learn.

There are several factors to assess a country's development such as crude birth rate, crude death rate, expectancy of life, infant mortality rate and per capita calorie intake are the commonest and closely related to the health issues. Economical and development status of Bangladesh is changing day by day. It is now facing the transitional shifting of developing to low-middle income developing country. The country is now experiencing a demographic transition. Access to safe water and sanitation are basic determinants of better health. Limited access of safe water and poor hygiene are associated with skin diseases, acute respiratory infections and diarrheal diseases, the leading preventable diseases in Bangladesh. Households without proper sanitation facilities have a greater risk of diseases like diarrhea, dysentery and typhoid (DHSB, 2014). With the government and non-government initiatives there are lot of development has been occur in health sectors. As Bangladesh has huge number of population, if there are small changes happen at anywhere it might impact a lot in a total. So, there are lot of scope to enhance the health status of the country by imparting education especially health education in a distance learning mode or online learning system. To attend at a respectable status and to prepare for the globalization we have to improve the essential health indicators. Major social development indicators and health indicators are shown in Table 1.

**Table 1:** Major Demographic and Health Indicators

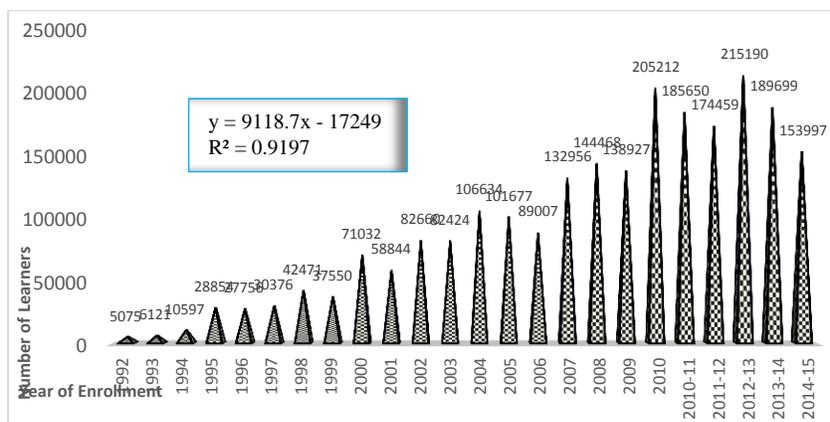
Category	Indicators	Unit	Value	Year	Sources
<b>Demography</b>	Population	million persons	160.0	2015	DHSB
	Annual Growth rate of Population	Percentage	1.37	2014	DHSB
	Average Life Expectancy at Birth	Year	71.8	2015	WHO
	Crude Birth Rate	Per 1000 persons	19.2	2014	DHSB
	Crude Death Rate	Per 1000 persons	5.5	2014	DHSB
	Childhood (under 5) mortality rate	per 1000 live birth	47	2014	DHSB
<b>Educational</b>	Enrolment Ratio in Primary Schools	Percentage	90.0	2011	
	Enrolment Ratio in Secondary Schools	Percentage	52.0	2011	UNESCO
	Enrolment Ratio in Universities	Percentage	14.0	2011	
<b>Human Resources</b>	Registered Physicians	Number	65,767	2014	DHSB
	Physician	per 1000 population	0.356	2011	WHO
	Person per Hospital bed	Number	1860	2010	DGHS
	Registered Nurses	Number	35,570	2014	BNC
	Registered Midwives	Number	23,472	2010	BNC
	Population per nurse	Number	5782	2010	DGHS
	Physician to Nurse ratio	Ratio	2.1:1	2014	BMDC
	No. of MOHFW's nurses	per 10,000 population	1.2	2014	DHSB
	No. of medical technologists	per 10,000 population	0.3	2014	DHSB
	No. of Community health workers	per 10,000 population	3.8	2014	DHSB
	Access to safe water	Percentage	97	2016	UNICEF

*Source: Bangladesh Bureau of Statistics, 2014; UNESCO, 2011; BNC, 2014; BMDC, 2014; DGHS, 2014,*

Health Bulletin 2014 stated that the number of doctors under Government Health Services is 23,066 and Nurses is 18,366. The number of registered diploma nurses is 33,183 and registered physicians is 65,767 and the number of registered dental surgeons is 6,034 (<http://www.observerbd.com/2014/10/28/51368.php>). The current doctor-nurse ratio is over 2:1 and it is highly unsatisfactory situation. Moreover, health related personnel who are employed are not adequately trained in their own profession. The improvement of physical quality of life implies achievement of good health and longer life as well as reduction in mortality and morbidity, more particularly among infants, children and women (DHSB, 2014, published in 2016). The health sector is one of the most labor-intensive sectors requiring a larger variety of skills to support and manage wide range of services. Besides the medical, dental and nursing professions and the health technologists there are still shortage of health allied personnel. At present, Bangladesh requires a large number of health and paramedical profession to work at the field level to support the health service programs to the community. It is the time to develop networked based health education facilities along with distance education that would be expanded the opportunity of mass education in the shortest possible time and provided the interactive mode teaching-learning facilities that takes place at a distance by the use of e-Learning system.

## 1. Bangladesh Open University

Bangladesh Open University (BOU) is the only public institution in the country that provides education in distance and flexible mode. BOU currently serves over 410,694 learners nationwide and delivered through 32 formal and 19 non-formal academic programs. BOU's education is flexible, cost-effective and comparable standard to the conventional universities (Islam and Selim, 2008). By imparting knowledge and skill to them, the university is contributing to human resource development in the country. Instead of off-campus-based teaching, this university uses several types of technology to extend education to every community, even to the most remote and rural areas, thereby contributing to the alleviation of poverty. From the begging of 1992 and up to 2015, BOU has enrolled 23,21,636 learners (SSS, 2015). The student enrollment trend analysis showed that student's enrollment rate is increasing more than 9118 in each year and 92% explained this increasing trend (Figure 1).



**Figure. 1:** Students Enrolment Trend of BOU

## 2. B.Sc.-in-Nursing Program of BOU

The nursing profession in Bangladesh has increased and reached at sustainable level. Due to huge demand and requirement at home and abroad, it is not possible to create conventional institutes of nursing to fulfill the needs and desire of this large force. B.Sc.-in-Nursing Program of BOU has been launched in 2003. It was one of the successful program of BOU where more than 90% learners have been participated in all scheduled activities. There are about 2760 diploma holder's nurses were enrolled and more than 2000 were graduated from BOU. Most of them are working in Bangladesh and some are working abroad. With personal communication, it is expected and acknowledged that graduate nurses of BOU are become more confident and are contributing a lot in their respective field. They are now take part in sectoral development and their performance has been accepted and evaluated successfully. Most of the BOU's graduates were promoted in higher post. Some of them have joined in nursing teaching profession as instructor; some of them are completed Masters of Public Health (MPH) and PhD degree. It is the great achievement of BOU that directly contribute to the development of the country's health status. By the

success of the nursing program, BOU is now planning to offer more health educational programs by using educational technology to change the views of mass people concerning the several health issues.

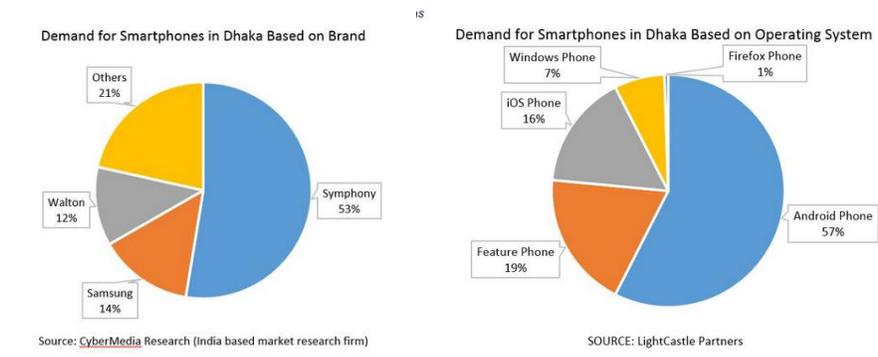
### 3. Development of ICT and its Prospect in Health

There have been tremendous development and expansion in the field of information and communication infrastructure at Bangladesh. Government has given importance to ICT for development in economic growth and poverty reduction (Nessa *et. al.* 2010). It has installed fibre optic link to the remote areas but the bandwidth speed is not enough. According to Bangladesh Telecommunication Regulatory Commission (BTRC), there are 131.376 million mobile phone subscribers at the end of June 2016 (Table 2).

**Table 2:** Number of Mobile Phone subscribers in Bangladesh

Operators	Active Subscribers in Millions
Grameen Phone Ltd. (GP)	56.909
Banglalink Digital Communications Limited	31.941
Robi Axiata Limited (Robi)	27.442
Airtel Bangladesh Limited (Airtel)	9.892
Pacific Bangladesh Telecom Limited (Citycell)	0.702
Teletalk Bangladesh Ltd. (Teletalk)	4.490
<b>Total</b>	<b>131.376</b>

Global ICT village is changing very rapidly and new technologies are replaced the old one. Internet connectivity and uses of smart devices are almost affordable for the teachers and learners. Figure 2 shows that the demand of android (57%) based smartphone is higher than other devices. At the same time, the cheapest and user friendly smartphone like Symphony (53%) is the most demanded phone for the people of Bangladesh.



**Figure 2:** Demand for Smart device and Phone

It is believed that ICT based e-Learning especially health education enhance the quality of life and improve the teaching-learning quality. It also creates the opportunity to teach learners and mass population by engaging and participating in health education for their personal and social wellbeing. It would be possible when a patient in remote place can consult the doctors over internet by audio-video conferencing or any interactive teaching-learning way (Nessa *et. al.* 2010). It has a scope to educate mass people by providing health awareness program through interactive, animated and/or viewing any drama that is related to human wellbeing. There are many countries cannot provide minimal health service to their people due to insufficient number of doctors, health care professionals and medical services. It is due to most of the hospitals and health care providers are often ill-equipped. This is particularly true for the health care systems at rural area, which are normally beyond the reach of general mode of communications. These insufficient infrastructures make it more challenging to provide health care in rural and remote areas. Alternatively, to educate the people and to increase the awareness of health issues, it is obviously provided e-Learning courses for the mass people.

To offer health educational program there should be required two types of readiness that is (a) infra-structural readiness and (b) user-end readiness. To achieve the optimum goal of e-Learning on health education; it requires maximum ICT-based infra-structure within minimum resources; motivate the faculty and learners to adopt the new

approaches. It is important to upload the lesson content in the native language context to set the stage for future development (Musawi, 2010). Online facilities have scope to create a real-time telemedicine that spread to door steps of the patients.

There is a good initiative has been taken by the Bangladesh Knowledge Management Initiative (BKMI) is developing an e-Learning courses that aims to increase the knowledge and skills of community health care workers, educators and other health influencers for the effective delivery of essential health services (Al-Masum and Chowdhury, 2013). Knowledge and skills gained by community healthcare workers, educators, and other health influencers will aim to improve the adoption of healthier behaviors by families and communities, and increase utilization of healthcare services, ultimately improving overall health and well-being. BKMI is developing e-Learning courses for low-literate health workers at the community level and other outreach workers.

With the rapid growth of technologies, Bangladesh Open University is planning to offer its tertiary level programs through online and interactive based e-Learning format. After successful development of tertiary level e-Learning programs it will turn to develop certificate or diploma level programs according to the learners and the country's needs. BOU has a well-equipped e-Learning Center to develop and offer e-Learning courses.

Now, BOU would like to offer e-Learning based interactive health and allied health education and training courses which would be more effective and beneficiary for the mass people of Bangladesh. The health education or allied health education through e-Learning have to increase the mass awareness of different health issues. It can create a skilled health professional by delivering interactive blended and e-Learning based "Primary Health Care" and "Masters in Public Health" programs as well as delivering a "Non-Formal Health Education Program". The graduates of health education program can contribute to develop the health policy and enhance the health status by contributing a lot in the health issues.

#### **4. The current e-Learning Status of BOU**

To foster the e-Learning at BOU, it has taken some initiatives (Mannan, 2015). These are as follows:

1. *Establishment of Interactive Virtual Classrooms (IVCR):* There are three IVCRs established with the assistance of KOICA those are situated at main campus and two regional center of BOU. These centers are functioning where 50 learners can accommodate in each center with full online support.
2. *Creation of skill human resources:* e-Learning center is providing on job training (OJT) to create skill faculty of Instructional Designer (ID), Subject Matter Expert (SME) and Content Developer (CD).
3. *BOU's E-Learning Platform/BOU's LMS:* It was developed with the assistance of KOICA and CEMCA for complete learner's management. On pilot basis, we have developed course content that has been uploaded into the Moodle of BOU LMS.
4. *Educational Resources:* All the text books of BOU has been converted to PDF format as E-books and uploaded to BOU website: [www.bou.edu.bd](http://www.bou.edu.bd).
5. *Video and Audio lectures* have been uploaded time to time in YouTube, Face Book and Twitter ([www.youtube.com/user/bdopenuniversity](http://www.youtube.com/user/bdopenuniversity); [www.twitter.com/user/bdopenuniversity](http://www.twitter.com/user/bdopenuniversity)) as OER resources.
6. *Development of BOU Apps:* Apps have been developed for all courses of all academic programs and other BOU information.

#### **5.1 Certificate in Primary Health Care (PHC) Program**

*"If you treat your patient, you have helped him for today; if you teach him, you have helped him for the whole life"* stated by World Health Organization. Education is an essential part of intervention because prevention is not only a matter of taking drugs but also of changing lifestyle (Nardini, 2000). The primary health care program is offering to increase the mass awareness of people regarding different health issues by providing community aspects of training to the mass population and untrained village quack whom are practicing at the rural areas in the country (Numan, 2001). Thus, this program increases the effectiveness of the worker and mass people in the health sector. BOU provides printed study materials guideline and an audio-video package to each learner along with face to face tutorial and ICT based online educational support with native language. The course structure of PHC is as follows in Table 3.

**Table 3:** Courses Comprising the Primary Health Care Program

First Semester	Credit	Second Semester	Credit
• Basic knowledge on Anatomy and Physiology	3	• Managing Health Services	3
• Mother and Child Health Care	3	• Food and Nutrition	3
• Community Medicine	3	• First Aid	3

## 5.2 Non-Formal Health Education Program

Education systems played a key role in changing attitudes and the societies. The objectives of BOU's non-formal programs are to create awareness and to motivate the mass people according to the situation demand. The awareness programs of BOU include health, environment, basic science, agriculture, food, nutrition and any other branch of knowledge for human development. The target groups of these programs are people from all walks of life, particularly those who intend to add further to their professional knowledge and skill without attending any institution or training center. BOU has produced about 450 non-formal programs, of those 72 episodes are health related programs. By the uses of technology, BOU has uploaded all its audio-video program at youtube, bou WebTV and broadcasting on air regularly at fixed times.

## 5.3 Master of Public Health (MPH) Program

The Master of Public Health (MPH) is a post-graduate level program that emphasizes the different areas of public health. It has been designing to prepare learners for their role in promoting community awareness on health issues, prevention of communicable diseases and other emerging issues that affect health and safety. MPH program would be the first time in Bangladesh that the curriculum and syllabus of the program has designed to synchronized and asynchronous mode of delivery system. All courses have been divided into 17 weeks of blended mode tutorials or e-Learning sessions based teaching-learning processes. Weekly sessions have been presented in a very lucid manner so that the learners can understand and assimilate by an average distance learner of the MPH program within the stipulated period of a semester. With the uses of technology, subject matters of a courses has been design as instructional materials using learning management system of Moodle. Carefully designed instructional tools could potentially enhance learners' motivation and participation. So, the learners can engage in off-line/online learning process.

MPH program is consisting of statistics/biostatistics, epidemiology, environmental health, health policy and behavioral sciences, maternal and child health, public health education, communicable diseases, disaster management, health services management and health economics courses. As it is a professional degree, learners are required to engage in work-related activities. This may take the form of an internship, or practical experience where the learners assumes job functions in the public health field. Most graduates find employment opportunities in health care settings. These settings are especially applicable for graduates that have an emphasis in health care policy, administration, epidemiology or communicable diseases. The nature of the program also provides opportunities for research and academic positions because graduates will have skills in statistics and biostatistics.

## 6. CONCLUSION

Health is wealth and a healthier population can be more productive that will improve the quality of life. The success of nursing program, it encourage the BOU to offer Primary Health Care and Master of Public Health program. Health education to mass people and allied health personnel will able to use their knowledge and skill to be a promoter of health care, and helping the people to make their own decisions regarding the health issues.

Health education is closely related to human life and hands-on activities. Delivery of health education through distance mode and online mode needs much care and devotion. To prepare the curriculum and syllabus in the blended and learner-centered format, it requires a set of skilled professionals, subject matter experts and instructional designer. To implement the ICT based online health education program successfully it also requires the readiness at the stakeholders and administrative levels.

Bangladesh has faces some constrain in ICT infrastructure, where shifting from "bricks to click" mode motivation is essential. To overcome the situation and delivery of online health education; we have to adapt ICT based educational media such as teleconference, audio-videoconference, and online communications for the learners. Moreover, this paper will pave the way for more research in future, in areas such as the use of modern technology which is in high demand in the Bangladesh.

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