Smart Bangladesh and Higher Education.

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ABSTRACT

ESD is the field of knowledge, skills, values to address interconnected global challenges including climate change, loss of biodiversity, unsustainable use of resources, and inequality. Higher education institutions have an essential role in sustainability. This is the key in the education of future leaders who will contribute to the implementation of Sustainable Development Goals.

The Higher Education institutions can find the solution about how education, research and professional practice can strengthen each other to provide for high-level professionalism to build up the student's skill for communication and collaboration, creativity and critical thinking, digital literacies, intercultural competence.

Innovation helps to understand the forms of socioeconomics by developing technological products and processes. Innovation is the key enabler of most of the SDG goals. ICTs have the potential to increase innovation. ICT is capable of strengthening the means of implementation for the SDGs by fostering international cooperation.

Information and Communication Technologies influence growth of economies and facilitate innovation, and have a direct impact on growth and competitiveness. According to the World Bank, the digital economy makes up more than 15% of the global GDP and has grown 2.5 times faster over the previous ten years than the GDP of the physical world. Sustainable growth means maintaining the growth rate without causing other economic problems.

"Digital Bangladesh: Vision 2021" was declared by the government of Bangladesh on December 12, 2008. The government has implemented a large number of projects relating to digital technologies and a number of these are already underway to develop the country as middle-income status by 2021 and developed status by 2041.

Dec 12, 2022 the honorable Prime Minister of Bangladesh announced 'Smart Bangladesh' by 2041. Smart Bangladesh is to mean the power of technology and innovation to improve the quality of life, enhance economic growth, and protect the environment.

Digital Bangladesh and Smart Bangladesh are two different concepts with different objectives and implications. After an evaluation of Digital Bangladesh, Smart Bangladesh is a step further by using emerging technologies to create a smarter and sustainable society.

SMART stands for Specific, Measurable, Achievable, Realistic, and Timely. The goals of Smart Bangladesh must incorporate all of these criteria to achieve by 2041.Higher Education Institutions can set the clear goals as the basis of building a vision or mission statement, as well as short-term and long-term action plans to achieve Smart Bangladesh.

This paper examines an observational methodology and evaluation to find a solution about how ICTs in higher education can be used to develop course material, delivering content and sharing content, communication between learners, teachers and the outside world. This will build up the teachers and learners ability to lead with purpose, communicate and prove value, analyze and use data, and maintain a big-picture mindset for a Smart Bangladesh and SDGs.

Key Words: Technology, ICT, Smart, Bangladesh, ESD

JEL Code: O1, O2, O3, O4, O5

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Introduction:

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Background Information

Before covid19 pandemic the world was under a growth slowdown crisis. Covid19 pandemic lost global growth at a higher percentage. Post covid19 economy needs more productivity with less pollution. The government of Bangladesh has taken a development planning named "Smart Bangladesh" where digital transformation and 4th industrial revolution will take place to build a developed nation by 2041. Highly skilled educated people are required to achieve the goal, but in Bangladesh, there are some obstacles for the faster development of human skill in the higher educational institutions.

Methodology

This paper examines an observational methodology and evaluation to find a solution about how ICTs in higher education can be used to develop course material, delivering content and sharing content, communication between learners, teachers and the outside world.

Objectives of this Study

Technological innovations are having a significant impact on educational systems at all levels. Online courses, teaching aids, educational software, social networking tools, and other emerging technologies are changing the traditional teaching and learning system. Objective of this study is to find the linear development situation of ICT at different levels of education to build a Smart Bangladesh.

Digital Bangladesh and Smart Bangladesh:

The primary goal of Digital Bangladesh was to use ICTs to create employment opportunities, reduce poverty, accelerate economic growth and improve the citizen's quality of life.

The goal of Smart Bangladesh is to transform Bangladesh into a developed nation by the year 2041. The Smart Bangladesh Vision 2041 is more comprehensive, goal-driven, inclusive, and effective than the Digital Bangladesh Vision 2021. The goals of Smart Bangladesh include building smart cities, advancing smart education, establishing a smart government, and generating a smart economy. According to the government of the country, the "SMART Bangladesh" ecosystem stands on the four pillars are Smart Citizen, Smart Government, Smart Society, and Smart Economy.

Smart Society:

In 2014, Charles Levy and David Wong described a smart society as a society that successfully harnesses the potential of digital technology and connected devices and the use of digital networks to improve people's lives.

First, it was the hunting society, second was the agrarian society, third the industrial society, and fourth the information society. The fifth stage will be an Imagination Society. The combination of diverse people's digital transformation, imagination, and creativity will solve society's problems and create new values. There is a transition to Society 5.0 and the 4th Industrial Revolution. Both the concepts refer to the transformation of the world towards a new paradigm.

Industry 4.0 can be efficiently used to control and improve vital resources, energy, water, and waste by connecting and automatically exchanging information through an interconnected communication system. The well-being of our future will be dependent on how we can produce technology that can govern our climate, health, social equity and stability. Technology 4.0 can be used to mitigate and provide a solution for enhancing our way of life by producing sustainable products and services.

In Society 5.0, any product or service will be optimally delivered according to people's needs. Society 5.0 will help to overcome significant social challenges such as an aging population, social polarization, depopulation, and energy and environment constraints. "Society 5.0" was presented as a core concept in the 5th Science and Technology Basic Plan, adopted by the Japanese Cabinet in January 2016. It was identified as a growth strategy for Japan.

The Japanese government and business community want to seize the golden opportunity to reverse lingering adverse trends. They aim to create a society where they can resolve various social challenges by incorporating the fourth industrial revolution innovations like IoT, big data, artificial intelligence, robots, and the sharing economy into every industry and social life. By doing so, the future society will be one in which new values and services are continuously created, making people's lives more conformable and sustainable. This is Society 5.0, a super-smart society. [Md. Anisur Rahman, Bangladesh Journal of Political Economy, Vol 38, No. 1, June 2022]

Smart Citizen:

A digitally literate person takes advantage of technology in a society. A smart citizen must be a law-abiding citizen with basic civic sense. Smart citizens produce and use information through systems in an efficient and sustainable way; they support the creation of an accessible and inclusive environment to increase prosperity and innovation within a city or community. The main goal of a smart city is to optimize city functions and promote economic growth. Smart citizens are active in the process of city design and are important for the success of the Smart Cities Mission.

Smart Government:

The use of innovative policies, business models, and technology to address the financial, environmental, and service challenges facing public sector organizations. The concept of Smart Government relies on consolidated information systems and communication networks.

Smart Governance is the use of technology and innovation to facilitate and support decision-making and planning within governing bodies to transform the ways that public services are delivered.

The goal of smart governance is to use technology to improve the efficiency and effectiveness of government operations by making it easier for citizens to access government services and information, and by helping government employee's work more efficiently.

Smart Economy:

Smart economy is based on technological innovation, resource efficiency, sustainability and social welfare; it refers to policies that stimulate innovation and creativity combined with scientific research, superior technology and care for the environment, through the concept of sustainability.

Smart Bangladesh Ecosystem:

An ecosystem consists of all the organisms and the physical environment with which they interact. The central role in the four pillars of Smart Bangladesh, ICT and digital technologies is a wave of global digital transformation. The digital transformation is changing the system of global production and process for global sustainability; it is changing the manufacturing, business and service system over the world and impacting the global value chain.
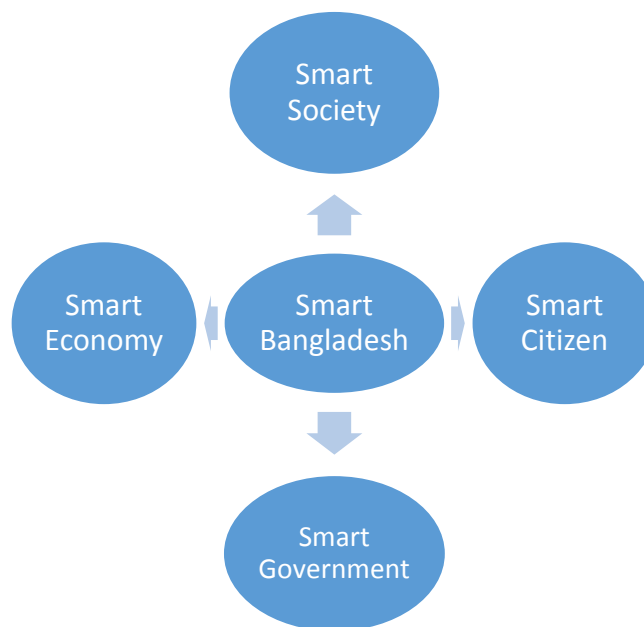
Smart Bangladesh Ecosystem.

Covid19 pandemic and Russia-Ukraine war shows a great loss of productivity and growth over the world including Bangladesh. To reach at the next normal of the world, there are no alternatives to grow the economy except the faster pace of increased productivity than ever before. Increase in productivity to raise the income of individuals and the country is the first condition to reach at the previous level of

growth and to minimize the average level of intended growth for the world to reduce poverty and inequality. Industrial production and services will have to run together to achieve GDP growth.

The 4th industrial revolution is an interconnected manufacturing and service system by using automation and digitalization technologies. This can increase productivity, lower waste and use of alternative environment friendly energy. The government of Bangladesh has already adopted the 4IR policies as national industrial development policy.

Smart Bangladesh by adopting 4IR technologies can increase productivity and growth in a sustainable way. This transformation will migrate the people in the city areas, because cities are now the heart of economic activities, the citizens now have to be able to adjust with the transformative socio economic activities in a sustainable way and the monitoring and service of these activities is changing the governance system. Data and information and its evaluation and monitoring both in government and private sectors depend on digital technologies and digital skills for timely, faster and accurate decision support for short and long term action plans.

Smart Bangladesh is a Knowledge Based Socio Economic Structure:

The world economy is transforming towards knowledge based economy and society is transforming towards knowledge based society as a whole the global socio economic structure is changing very fast based upon knowledge. This transformation of the world is not always maintaining the sustainable standard. Education, training and skill development can ensure increased productivity and sustainability.

Higher educational institutions can ensure the ethical innovation for sustainability by acting as entrepreneurs of sustainable development. Technology can play a crucial role in changing the traditional methods of teaching and learning by using digital technologies to build a Smart Bangladesh.

The world socio economic structure is transforming very fast and depending upon different disruptive technologies. The local and global job market is at risk, there need more advanced skilled workforces both in developing and developed countries including Smart Bangladesh. Covid19 affects almost all the targets of SDGs. The world needs urgent data and information to take action at the right place at the right time to survive SDGs. Digital technologies can connect all the 17 goals of SDGs through data and information for new initiatives. The skill upon disruptive technologies mainly the digital technologies is an urgent demand in the local and global job market. Higher educational institutions can improve student skill at a global level.

Higher education also includes teacher-training schools, colleges, universities and institutes of technology after passing secondary or higher secondary school certificate courses. Innovation is the key feature of sustainability. Sustainability can drive innovation by introducing new design constraints that shape how key resources like, energy, carbon, water, materials and waste are used in products and processes. Sustainable innovation is a rational and collaborative way to maintain socio economic values for present and future generations. A key role of higher education institutions is to drive innovation, with the aim of finding solutions to global challenges in areas that matter to socio economic development. The role of higher education for sustainable development involves changing the means and processes of knowledge production and the way in which students are trained, making students more socially responsible, critical and sensitive towards sustainability. [Md. Anisur Rahman, 1st International Academic Conference on the SDGs, UN-UVU, 7 October 2022]

Technology and Innovation: A Global Evaluation on Bangladesh.

1.	Human Capital development Index	Bangladesh ranked 129th out of 191 countries in the 2021/2022 human development index (HDI), placing the country in the 'Medium Human Development' category.	UNDP, Sep 8, 2022
2.	Global Innovation Index	The statistical ranking of Bangladesh in the Global Innovation Index 2022 is between ranks 93 and 110. Rankings for Bangladesh. 2020 – 116, 2021 – 116, 2022 – 102.	Global Innovation Index GII-2022.
3.	Digital Ranking.	Bangladesh has ranked 96th among 113 economies in the Global Index of Digital Entrepreneurship system.	Asian Development Outlook 2022, ADB.
4.	Technology Maturity Index.	"Gov Tech Leader" placing 29th among 198 countries.	World Bank's GovTech Maturity Index, Nov, 2022.
5.	ICT Development Index.(An Evaluation of USA)	Bangladesh ranked 147 out of 176 on the most recent ITU's ICT Development Index a report that captures the level of ICT development.	International Trade Administration. US Department of Commerce, 20 July, 2022.

GDP growth of Bangladesh in 2019- 7.8%, 2020- 3.45%, 2021- 6.94% and 2022-6.2% is a good percentage during and after Covid19 pandemic in comparison with the other countries in the region. During rapid technological and digital transformation of the world, the related index of the country is not as good as it needs to adopt the transformation. Post covid19 economy requires a huge amount of educated skill manpower around the world. Appropriate action and initiatives can fill this demand to build Smart Bangladesh and can distribute educated skilled manpower around the world for a sustainable transformation is helpful to achieve SDGs. This shortage of skill around the world and in the country is due to a combination of required skill and education.

Resilient Education for Smart Bangladesh:

Resilience is the ability to bounce back from adversity. It is a necessary skill to bounce back and to bounce forward. It is the process of successfully adapting and adjusting to external and internal demands.

In teaching, Resilience means understanding and motivating what we cannot change or control and focusing on the positive impact we can bring with the areas in which we can control and change to achieve a goal.

In learning, Resilience is the ability to withstand, address, adapt and adjust to changes and to bounce back from failure. A student learning to handle hurdles will have lasting impact in their future careers and relationships.

Higher education is in the era of digital transformation. Teaching and learning through digital technologies make the digital platform in education globally. The Covid19 pandemic forced colleges, universities, instructors, and students to shift online rapidly.

College, Universities, Research and Training centers can be more productive, effective and efficient by using digital technologies. Students can use these cutting edge technologies and can access various learning medias as they need. Teachers can use it to discover and develop tools for their teaching to add value in teaching.

Digital Transformation in higher education can be benefited in the following areas.

a)   Increase availability of learning materials electronically.
b)   Improve the learning environment.
c)   Improve research data availability.
d)   Improve Innovation capacity for students and teachers.
e)   Increase the use of digital technologies.
f)   Increase interconnection with the world of education.
g)   Increase operational management capacity.
h)   Reduce overall cost.
i)   Increase connection with the communities.
j)   Increase intellectual Properties.

ICT is a compulsory course for the students of class six to twelve in Bangladesh, that are helpful for the students in their higher education and research, but there are some obstacles in gaining full potential of ICT from the academic institutions in the country at school and college level.

a)   At the school level students are not trained as good computer users.
b)   In many schools there are very minimum facilities for computer laboratories.
c)   In (10+2) level the student cannot learn computer browsing and using different software as early as they need to be efficient due to lack of previous experiences.
d)   Teachers are not well trained about their academic curriculum.
e)   Shortage of computers in proportion with the students at the institutions.
f)   Student's parents at a higher percentage in the rural areas are not able to buy a computer at their home for the homework of a student.
g)   Insufficient academic infrastructure for a computer laboratory.
h)   Higher teacher student's ratio.

There are 53 public universities and 109 private universities in Bangladesh are UGC (University Grant Commission) approved. 2,254 affiliated colleges under National University. The Government of Bangladesh with the support of the World Bank intends to improve the quality and relevance of tertiary college education in Bangladesh for enhanced employability of graduates and to strengthen the management system of the college education sub-sector through the proposed College Education Development Project (CEDP). There are 120 colleges in the country under CEDP. The CEDP aims to strengthen the strategic planning and management capacity of the college education subsector and to improve the teaching and learning environment of participating colleges. The CEDP is under the Ministry of Education and co-executed by the National University and the University Grants Commission of Bangladesh. Other key partners include Directorate of Secondary and Higher Education (DSHE), Bangladesh Open University (BOU), National Academy for Educational Management (NAEM), University of Nottingham Malaysia Campus (UNMC). Their major focus is to develop the,

a)   Teaching and learning environment.
b)   Increase the quality of education and its management.
c)   Use of digital technologies in teaching and learning.

The following actions at a higher percentage in a rapid manner can achieve the objectives of the project to make a teacher and student skilled.

a) Training of trainers.
b) Teacher training.
c) Capacity building of college management staff.
d) Development of training contents and materials.
e) Distance learning through online platforms.

Challenges to Overcome:

CEDP is trying to solve the problem of making a teacher and student innovative and digitally skilled, but the students coming from the SSC and HSC level are not much efficient in a higher percentage to take advantage of CEDP projects at their institutions. CEDP is working only with 120 colleges out of 2254 colleges is a f percentage, if it cannot increases the percentage of colleges under the project, there will be very minimum possibilities to make a teacher and student innovative and digitally skilled for the whole nation. There are some specific challenges to overcome this situation.

a) In class 6-10, the student must be digitally literate and a good user of computers.

b) In class 10+2 the teachers and the student must be efficient on digital teaching and learning materials to gain knowledge on curriculum.

c) In class 12+4+1 the teachers must be efficient in creating new innovative ideas on curriculum and students must be able to understand the innovation, because in all levels of education, curriculum correction is a delay process.

d) In class 12+4+1 in all levels of education there must be a new inclusion in their curriculum for all faculties about Digital Transformation, 4IR, Digital Bangladesh, Smart Bangladesh and sustainability in a very simple method.

e) Increase of training, research, seminar and workshop funds on Digital Transformation, 4IR, Digital Bangladesh, Smart Bangladesh and sustainability.

f) Increase of teachers and trainers training on their subjective curriculum with the combination of digital technologies and education materials in all levels of education.

g) Increase of global cooperation to promote SDGs in the academic and research institutions for a shared and mutual benefit.

h) Special initiatives to build a reasonable number of Digital Economists in the academic and research institutions, digital transformation are changing the global economy.

i) Increases the percentage of colleges under the CEDP project.

j) Increase of financial cooperation between Bangladesh and other nations for higher education to achieve SDGs.

Conclusion

The world socio economic structure is transforming very fast and depending upon different disruptive technologies. Smart Bangladesh is a socio economic transformation. The global job market is at risk, there need more advanced skilled workforces both in developing and developed countries. Covid19 affects almost all the targets of SDGs. Digital technologies can connect all the 17 goals of SDGs through data and information for new initiatives. Higher educational institutions can make a student skill at a global level. Higher educational institutions and their global interconnection and cooperation both technologically and financially can make the students ethically innovative to adopt socio economic transformation for a sustainable country and the world.

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