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Integrating Web-based e-Learning in TVET to Enhance the Literacy and Socio-economic Condition for Sustainable Development of Bangladesh

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Abstract

The purpose of the research is to use the technologies to shift the emphasis from teaching to learning. The ultimate goal of Web-based e-Learning is to bring the learning to the learners, not to bring the learners' to learning. The teaching-learning phenomena of developed countries have changed from Brick to Click approaches (e-Learning). However, Web-based e-Learning is still new paradigm in developing countries like Bangladesh. Web-based e-Learning is absent in technical and vocational education and training (TVET) system. TVET in Bangladesh is depriving from the benefit of Web-based e-Leaning. Thus, the aims of the research are to illustrate the residence with mode of internet use and internet services with level of education; to explore the current literacy rate (%) by different economic classes in rural and urban areas; to identify the physical facilities of TVET classrooms; and to assess the infrastructural conditions of TVET institutions for providing the suggestions to Web-based e-Learning integration in Bangladesh. The researchers have visited 45 TVET institutions and observed 210 live classrooms in Bangladesh. The infrastructural conditions of 30 TVET institutions in urban areas were also observed with the structured questionnaires to get the results for applying the concept of Web-based e-Learning integration. The expected outcomes of the research are, once the e-Learning system can be introduced in TVET in developing countries like Bangladesh, there will be a breakthrough in the education system. More students will be enrolled, outreach will go further, better learning material will ensure quality output, ICT based technology will be adopted in the process of and finally bring an integrated benefit to the society.

Keywords: Web-based e-Learning, TVET, Literacy rate and Socio-economic development.

1. Introduction

Rural population (% of total population) in Bangladesh is 71.90% in 2010 (World Bank report, 2012). There have 3,116 + technical and vocational education and training (TVET) institutions in Bangladesh (Education Sector in Bangladesh, 2012). Most of the TVET institutions are located in the rural areas. The rural and urban has enormous information gaps in terms of teaching-learning in Bangladesh. e-Learning, the recent trends can bridge these gaps by providing need-based or competency-based educations. In the field of Technical and Vocational Education and Training the last decade is characterized by a growing interest in ICT, e-Learning, Online learning with a recognizable trend of enhanced application of e-Learning technologies. The process has been accelerated by ever increasing scarcity of trainers, escalation of cost of education and rapid growth of technology. Particularly the growth of Computer and Internet technology has enabled e-Learning to evolve into a feasible alternative learning paradigm. Commensurate with the evolution, concepts like Virtual Universities and Twenty-Four Hour learning have become reality (Confod, 2000; Daniel, 1998).

This article refers e-Learning to the utilization of information systems and information technology in educational services. Various applications and processes that could be delivered in synchronous or asynchronous format, like Web-based learning, Computer-based learning, virtual classrooms, digital collaboration etc. are the examples of e-Learning methodologies. The e-Learning has become a widely accepted concept mostly in the developed countries. Adoption of e-Learning in many of the developing countries, however, has become a real challenge (Bose, 2003; Asia-Pacific e-Learning Alliance, 2002). Being a developing country with limited access to the current advanced technologies, Bangladesh is not an exception.

There have no substantial e-Learning framework in technical and vocational education and training (TVET) in Bangladesh. TVET is one of the main sources for capacity building and empowering the people of the

developing country like Bangladesh. Thus, education and capacity building are now being considered as the critical steps for entering into the new global economy. For a developing country like Bangladesh, e-Learning could be considered as a critical facet of basic development, an alternative medium of capacity-building and a means to people's empowerment (Sehrt, 2003).

The e-Learning integration concept is the new beginning phenomena for the developing countries. The e-Learning has a very distinct role to play in the context of scarcity of resources in developing countries. The most significant limitation of educational framework in these countries is the dearth of educational institution and qualified trainers for higher studies. There exist only few institutions facilitating continuing education for the professionals. But, the need for such facilities for professional development of the technologists is well recognized. Its demand is further enhanced by rapid evolution of technology and role of the technologists in socio-economic development of the country. Despite having the potential to contribute in the educational advancement of developing countries, e-Learning needs to be designed carefully to overcome the technological and infrastructural limitations (Alam, Kabir, & Elizabeth, 2003).

The integration of Web-based e-Learning in TVET is worthy in the sense that e-Learning or distance learning is not supplementary to conventional learning methodology rather complementary to the conventional system. In fact, it facilitates continuity of marginal development in profession technical expert in the most cost-effective manner. The e-Learning is expected to facilitate the following: (i) enable dissemination of expertise and state of the art knowledge to the field level technologies in an efficient and cost-effective way; (ii) facilitate continuing education for the technologists, researchers and academicians at a very low cost through arrangement of advanced lectures provided by the international experts (Alam, Kabir, & Elizabeth, 2003).

The research objectives of the article are (i) to illustrate the residence with mode of internet use and internet services with level of education; (ii) to explore the current literacy rate (%) by different economic classes in rural and urban areas in Bangladesh; (iii) to identify the physical facilities of TVET classrooms for integrating Web-based e-Learning; (iv) to assess the infrastructural conditions of TVET institutions for Web-based e-Learning integration.

The World Bank Policy Paper on TVE (1991), says that to get the maximum benefit to national development from TVE certain factors must be considered: (i) Well - timed modern courses linked of local and global demand; (ii) relevant and up - to - date TVE courses need to be developed; (iii) proper justification in respect of individual country that at which level of schooling is best in offering TVE courses; and (iv) wider range of TVE courses need to be developed in terms of demand and cost effectiveness (not only for offering various courses but also for duration of the courses, for student classification in terms of their merit, ages, job market, etc.). Lewin (1993, p. 14) claims that TVE seems to allow us to "kill several birds with the same stone." Akyeampong (2002) points out that TVE in national educational system not only for its economic contribution but also for its cultural, social and political contribution. International Labor Organization (ILO) (2001) claims that TVE is intended as a bold and courageous step to undertake, with the changing scenario for economic life by developing human capital (Alam, 2008).

2. Country context: challenges and prospects for e-Learning integration

Bangladesh is estimated to have a population between 140 to150 million (Population estimation report, 2008) with a correspondingly extreme population density of more than1000 persons per square kilometer (Population estimation by UN stats, 2008). 40% of the population of Bangladesh is estimated to continue to live below the national poverty line. Bangladesh is one of E9 countries and a Least Developed Country with deep-ridden and inherited extreme poverty and hunger, growing social and economic disparities (UNESCO, 2012). Challenged with such a magnitude of development issues, the country has made progress over the past decades. This was noted, that Bangladesh is one of the countries that have made the greatest progress in recent decades as measured by a new version of the Human Development Index (HDI) (Human Development Report, 2010), According to the report, Bangladesh's HDI has increased by 81% in the past 30 years (United Nations Development Programme, 2010). In 2011-2012 the education sector was allocated almost 2% points less than the previous fiscal year, ending at a mere 12.4% of total budget (UNESCO, 2012).

The World Bank (2002) described Bangladesh as lagging behind the economic growth of technical and technological modernization, but went on to note that "Bangladesh's greatest strength is its people. Ethnically homogeneous and firmly wedded after much turmoil to the intuitions, they are well known for hard work and resilience under stress" (World Bank, 2002, p. 6). The World Bank also noted that Bangladesh has no more alternatives in order to gain development, except properly utilizing its population. The World Bank (2002), United Nations Development Programme (UNDP) (1999), United Nations Educational, Scientific and Cultural

Organization (UNESCO) (2001) all suggest that Bangladesh urgently needs to utilize its over-crowded population and large labor market. To improve the quality of employees, Bangladesh's people need to be trained in modern professional-based and job-oriented technical, technological and vocational programs.

Again the World Bank (2002) report suggests that Bangladesh's economy and human development could have grown faster than its actual progression in the last 25 years (i.e., since independence in 1971), if it had earlier taken substantial steps in educational development. For example, the economy of South Korea, Thailand and Malaysia reached upper middle-income status within about 25 years after achieving political stability. This outstanding improvement in living standards and quality of life for the citizens was achieved by securing an appropriate educational atmosphere in order to provide high quality education in different technical and professional fields (Alam, 2008).

Although with the technological innovations and increased availability of resources the popularity of e-Learning has been increasing in Bangladesh, it is still widely used as a complementary tool for teaching purpose. In fact Web-based e-Learning is used to enhance the scope of students to learn more, get access to the resources whenever possible and required, and use technology for understanding the mechanism of the problem more comprehensively. The Bangladesh Government is giving priority to establish a minimum of one technical education institute per Upazila (sub district) for the expansion of the TVET sector and there have the vision 2021 goals pertinent to educational development, namely, Building Digital Bangladesh through extensive use of and capacity development in digital technology (National Education Policy, 2010).

The recent growing trend of Web-based e-Learning is mostly benefiting the developed countries due to some predominant facilities like infrastructure, technology, relevant content and responsive learner community. However, the Web-based e-Learning scenario in developing countries like Bangladesh is still a new era for the learner communities. Due to reverse economic and social conditions of developed countries, countries like Bangladesh could not yet establish a reliable e-Learning system or institution. The acceptance of such learning facilities is not yet accredited or even accepted by the local authorities in most of the times. The integration of new technologies like Web-based e-Learning into Bangladesh education system will itself create many challenges, including financing, skills, capacity and many others. Though the goal of integration Web-based e-Learning system is to reach to all communities of the society but in reality only the privileged community of the society will benefit from such learning mechanism due to the existing national strategy, infrastructure and social condition. In fact, though the challenges facing Bangladesh are significant, the challenges of old, low and uneven education participation, poor quality education, low per capita incomes, and a rapidly growing population have been joined by new and more daunting challenges, including corruption, globalization, lack of political commitment, and rapidly advancing technology (Akber, 2005).

The knowledge and skill have become the currency for future. The 'Anytime, Anywhere and by Anyone' nature of Web-based e-Learning makes it an attractive tool for dissemination of skills and knowledge of the developed countries to the developing countries. It could also be useful for the portion of the population in Bangladesh, where cannot enroll in the formal educational programs. In primary education, the Gross Enrolment Ratio (GER) 95%, secondary education 47% and the tertiary education the enrolment is 8% (2009) (UNESCO, 2012). In Bangladesh, the teaching resources in the TVET sectors (secondary level) are very limited compared to the number of students and the number of teachers. In this situation, Web-based e-Learning could be a very effective way to deliver quality learning-materials to all the learners. The literacy rates are 55.90% (adult 15+) and 75.5% (youth 15-24) in 2009 in Bangladesh. The pupil/teacher ratio in primary level is 1:46 (UNESCO, 2012). So, the numbers of teachers are not sufficient in all levels of education to teach the students in a formal ways. Even, the scarcity of good teachers followed in the rural areas in Bangladesh.

When illiteracy is one of the major issues in Bangladesh and the goal of 'Education for All' is being vigorously pursued (Education of Bangladesh, 2012). Thus, the integration of Web-based e-Learning could be a good solution for attracting the learners for ensuring attendance from the primary schools. While attracting the learners is necessary mainly for the primary level; for secondary and tertiary level, e-Learning is sometimes more than necessary to ensure the quality of education (Pathan & Hassan, 2005).

The Internet access in Bangladesh is still limited for several reasons like poor electricity networks, high cost of computers, weak telephone networks, lack of knowledge of Internet etc. Internet connections are available mostly in the major towns and cities with limited penetration to the rural or sub-urban areas of the country. The positive aspect is that, Internet usage in Bangladesh has increased rapidly over the last few years. The numbers of Internet Service Providers (ISPs) and Cyber Cafes have also increased (Rahman, 2004). As a result of their competition, prices have fallen greatly and several ISPs are now offering flat monthly rate. Browsing habit among the learners for learning various topics from the Internet has also increased to a great extent (Pathan & Hassan, 2005).

Due to a lot of constrain, the integration of Web-based e-Learning in TVET in the rural areas are difficult but possible in Bangladesh. The audio-video tapes and CD-ROMs could be some handy alternatives to Internet for delivering e-Learning materials. In particular, the use of audio cassette players is quite wide spread in Bangladesh. Many people also use video technology. Again many of them have computers without Internet access. In this situation, audio-video tapes and CD-ROMs could be considered as the primary tools of e-Learning especially in the rural area in Bangladesh. It is consider that, e-Learning is basically the technology driven or technology based learning. So, involvement of the Web or the Internet may not always applicable, rather use of the information and communication technologies (ICTs) for learning purpose could be termed as e-Learning in this case. Recently, the 'Modem' is available and widely uses by the students' for browsing Internet in all the parts of Bangladesh.

Poverty and illiteracy are interwoven in Bangladesh. Each is the cause and effect of the other. Thus the socio-economic conditions will not be elevated without improving the system of teaching-learning. At the inception of Bangladesh in December 1971, the literacy rate was only 16.8%, in 1974 25.9%, in 1991 35.3%, in 2001 47.9%, in 2008 48.8%, and in 2010 59.82% (15 and above age) (UNESCO, 2012). Bangladesh has since made remarkable advances in championing the causes of education and making it a serious public purpose. According to the latest estimation, almost 59.82% of the total population in Bangladesh is literate. However, very small portion of this literate population is aware of the technologies. Though the first main frame computer came to Bangladesh in 1964, the usage of PCs became popularized very late to the common people (Rahman, 2001) and also Internet came late with UUCP (Unix to Unix Copy Protocol) email beginning in 1993 and IP connectivity in 1996 (Press, 1999). Computers and other technical devices are still accessible mostly by the middle, higher middle, and rich class of the total population. Nevertheless, proper technical knowledge will be often missing among the major portion of the overall population. It is in fact, a great hindrance for introducing Web-based e-Learning in larger scale.

On the other hand, in Bangladesh, the major portion of the learners comes out from Bengali medium (native language). As a result, most of them have been suffered from poor knowledge in English. Hence, even if the Web-based e-Learning contents are made very much available to them, it will be very hard to get the maximum benefit from it. A good solution to this could be the use of the native Bengali language. In fact, use of native language is preferable for any kind of learning (Best Practices, 2001).

The wealth or poverty of nations depends on the quality of higher education (Akpomi, 2009). This therefore means that the quality of graduates pushed into the workforce by higher education set pace for national growth and development (Oseni, 2011). Thus the main concern is to prepare the Web-based e-Learning contents. The Web-based e-Learning contents could be expensive, especially when they are customized. A country like Bangladesh, where poverty is one of the major issues, the high cost of using Web-based e-Learning would discourage the learners to use Web-based e-Learning. The success and developmental advancement in technical and vocational education which have been actualized over the years has been frustrated to failure as a result of poor funding (UNESCO, 2004). So, the costs should be minimized to an acceptable level for the common users, while the content is expected to be of high quality for attraction. If the people find them useful within an affordable cost, it certainly would get the popularity in Bangladesh. It has been strongly believed that the objectives of job creation and poverty reduction can only be realized through appropriate education which empowers the products of the education system with skills and competencies to become self-employed. These hope, can only be true and realized only if the vocational subjects are taught successfully in the secondary schools and tertiary institutions (Osuji, 2004).

The e-Learning integration is a kind of great challenge for Bangladesh. However, it can be smoothly happened if have the good number of the Internet users in the country. The study on Bangladesh Literacy Survey (2010) revealed that, Internet usage by the population 15 years and over is only 1.49% used internet at the national level, and the corresponding figures were 2.00% for males and 0.97% for females. In the rural areas, only 1.13% used internet (1.52% males and 0.73% females) compared to 2.61%, 3.50% and 1.72% for both-gender, males and females in the urban areas.

According to Bangladesh Literacy Survey, (2010) as regards mode of using internet 63.80% used internet at the national level through mobile phones 33.22% used computers, and 2.99% used both media. There exists no significant variation in the use of internet by different modes among males and females. Among males, 63.90% used cell phone, 33.30% used computer and 2.80% used both technology for using internet compared to the corresponding figures of 63.57%, 33.05% and 3.38% among females. There exist significant urban-rural variations in the mode of use of internet (in figure-1) in the rural and urban area. More than 80% rural people used internet through mobile phone compared to less than 50% for the urban people.

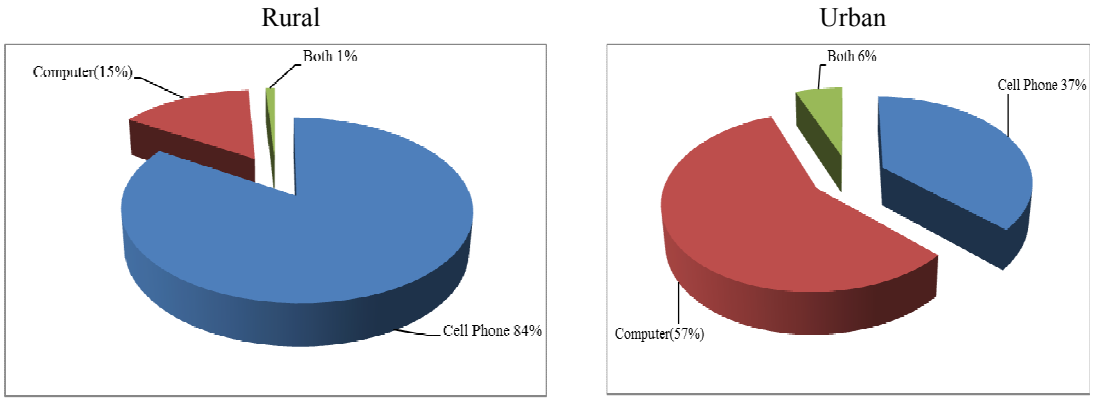

Figure. 1 Percentage distribution of population aged 15 and over by place of residence and mode of internet use in, 2010

Recently, the use of internet by level of education has been presented (Bangladesh Literacy Survey, 2010). There exists positive correlation between use of internet and level of education. The higher the level of education, the higher is the use of internet facility (in figure-2). While only 0.48% having education level VI-VIII used internet, 17.76% among those having Master's degree and 27.35% having Engineering/Medical degree used internet. There exists gender variation in the use of internet where male used it at higher proportion than females in all educational levels.

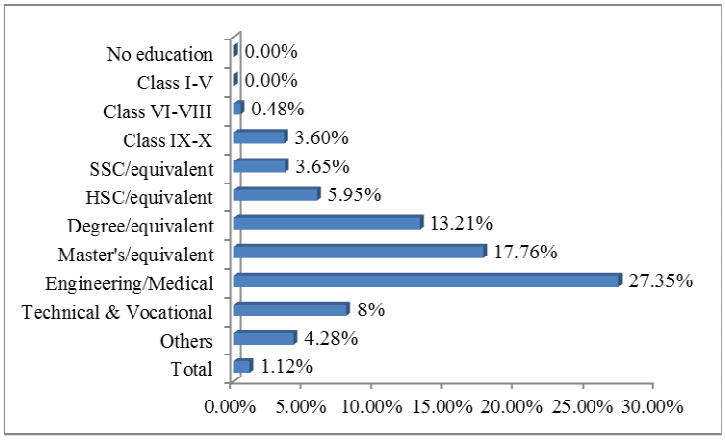

Figure 2. Percentage distribution of population aged 5 years and over by use of internet services and level of education, 2010

The latest study (Literacy Assessment Survey, 2008) revealed that socio-economic correlates of literacy. The statistical techniques are used to estimate the wealth index in Bangladesh. The individual household wealth index is constructed for overall country, rural and urban areas including gender differentiations. The study subdivided the households into five equal groups as shown in Figure 3. Poorest indicates the one fifth of total households which carried the lowest number of household wealth scores, Poor indicates the next one-fifth, and so on. The Richest group includes the one fifth of total households which are carried highest number of household wealth index/level.

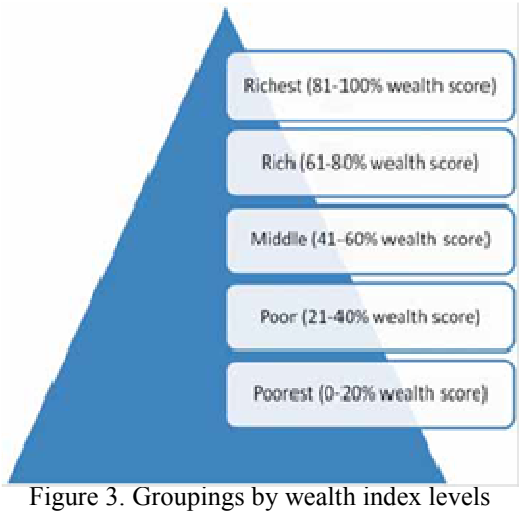

Figure 3. Groupings by wealth index levels

The literacy rates according to household wealth status are revealed in Table 1, Table 2, and Table 3.

Table 1. Literacy rate (%) by different economic classes (Literacy Assessment Survey, 2008)

Wealth Level	Overall Bangladesh	Sex	
		Male	Female
Poorest	28	28	29
Poor	39	38	40
Middle Class	51	51	51
Rich	64	64	64
Richest	76	76	75

Table 2. Literacy rate (%) of different economic classes in rural areas (Literacy Assessment Survey, 2008)

Wealth Level	Overall rural areas	Sex	
		Male	Female
Poorest	25	25	25
Poor	34	34	34
Middle Class	48	47	49
Rich	58	58	58
Richest	69	68	70

Table 3. Literacy rate (%) by different economic classes in urban areas (Literacy Assessment Survey, 2008)

Wealth Level	Overall urban areas	Sex	
		Male	Female
Poorest	32	30	36
Poor	47	46	48
Middle Class	57	59	55
Rich	71	71	70
Richest	83	83	84

For overall Bangladesh, (in table-1) the literacy rate among the household wealth level varied by 20% (standard deviation observed the percent); the literacy rate by household wealth status between male and female is very close. In table-2, in rural areas, the literacy rate was 48% for middle class families this rate was observed higher in female household than that of male; the literacy rate is observed 64% lower in poorest family compared to the

richest family in rural areas; this rate was found 25% for poorest family and 69% for richest family; however, among the household wealth status the variation of this rate was found around 18%; in rural areas the literacy rate of female was somewhat higher than that of male. In table-3 indicates the literacy rate by household status for urban population; among the urban people, the literacy rate for middle class family was 57%, however such rate was shown 32% and 83% for the poorest and the richest family respectively; this rate was observed 51% point lower in poorest family compared to richest family; the variation of this rate among the household wealth level groups' people in urban area was found around 20 % (standard deviation of observed percent); in urban area the literacy rate was found somewhat higher for female compared to male; this rate was observed 53% and 48% lower in poorest family compared to richest family for male and female respectively.

Most elite parents think that their children should not become a laborer. Even if their children are less academically able, parents try to push their children into higher education - disobeying the law. Social elites and political leaders in Bangladesh do not bother much about the law. They also send their children to study abroad. In such circumstances, poor parents become disappointed about their children's education (Alam, 2003, 2007); the quality of TVET is poor and cannot provide sufficient significant knowledge for jobs. Most of TVET schools are also located far from rural areas; meaning village students cannot have access to them easily (World Bank, 1991).

One survey (methodology) was conducted by the researchers on December 2011. The purpose was to investigate the physical facilities of the live classrooms of TVET to guess the possibilities of introducing Web-based e-Learning in future in Bangladesh. In the same time the infrastructural conditions of TVET institutions were also observed. The two structured questioners (tools of the research) were used and followed by five categories 'Likert-Scale' such as 5(Excellent) = EX, 4(Good) = GD, 3(Average) = AV, 2(Poor) = PR and 1(Very Poor) = VP. The Weighted Average has computed for each item of the questionnaire using the following formula (Gay & Airasian, 2003).

$$WA = \frac{N_1 + 2N_2 + 3N_3 + 4N_4 + 5N_5}{N_1 + N_2 + N_3 + N_4 + N_5}$$

Weighted average	Responses
5≥ WA>4.5	Excellent (5)
4.5≥ WA >3.5	Good (4)
3.5≥ WA >2.5	Average (3)
2.5≥ WA >1.5	Poor (2)
1.5 ≥ WA >0	Very Poor (1)

Table 4. Physical facilities of TVET institutions (Classrooms) in Bangladesh

(No of observed institutions, N=45 and Classrooms=210) in December 2011

Physical facilities in	Observation	EX (5)	GD (4)	AV (3)	PR (2)	VP (1)	WA
Classrooms	Internet facilities	3 7%	14 31%	27 60%	1 2%	-	3.38 (Avg)
	Intranet facilities	-	-	-	-	45 100%	1.00 (v.poor)
	Multimedia	26 58%	16 35%	3 7%	-	-	4.51 (Excl)
	PDF files and PPT uses	41 91%	4 9%	-	-	-	4.91 (Excl)
	Computer set-up	18 40%	6 13%	14 32%	1 2%	6 13%	3.64 (good)
	Web-based e-Learning	-	-	-	30 67%	15 33%	1.67 (poor)
	Update Software installation	41 91%	4 9%	-	-	-	4.91 (Excl)

The classrooms observed results have revealed that teaching facilities with Multimedia, Computer, PDF and PPT are excellent in Bangladesh. However, the e-Learning conditions are poor and Intranet facilities are very poor in situation. The teaching facilities with Multimedia, Computer, PDF and PPT are excellent. So, those are the good indicators for integration of Web-based e-Learning in TVET in Bangladesh.

Table 5. Infrastructural conditions of TVET institutions in Bangladesh

(No of observed TVET institutions, N= 30) (Rich-type: Urban Area, December 2011)

Conditions	Observation List	EX (5)	GD (4)	AV (3)	PR (2)	VP (1)	WA
Infrastructural	Buildings, lands and properties	25 83.33%	5 16.67%	-	-	-	4.83 (Excl)
	Human resources (number of teachers)	-	5 16.67%	25 83.33%	-	-	3.16 (avg)
	Economy (funding)	-	30 100%	-	-	-	4.00 (good)
	Internet connectivity	-	-	30 100%	-	-	3.00 (avg)
	Electricity	-	-	25 83.33%	5 16.67%	-	2.83 (avg)
	Availability of Computer operating software	25 83.33%	5 16.67%	-	-	-	4.83 (Excl)

The observed TVET institutions have the excellent infrastructural conditions in terms of the buildings, lands, properties, and availability of Computer operating software. The economic conditions are also good. The internet connectivity, number of teachers′ and the conditions of electricity in TVET institutions are average-type. The overall, infrastructural conditions of TVET are good for Web-based e-Learning. Thus, initially Web-based e-Learning can be introduced from the urban (big cities) areas and it can be connected with the sub-urban and rural institutions.

3. Conclusions and Recommendations

Scholars argue that countries need a well-diversified education system in order to gain sustainable development through education (Alam, 2008). Bangladesh needs local, relevant and user friendly Web-based e-Learning system, not only high tech solutions. This could be the major point to make Web-based e-Learning acceptable to all in a developing country like Bangladesh. Another critical challenge still remains. By its very nature, Web-based e-Learning is easy to sign up but the completion rate is not always satisfactory (Martinez, 2003). However, in consideration of the recent growth in the Information and Communication Technology (ICT) tools all-around, the opportunities are now promising to introduce Web-based e-Learning program in Bangladesh at broader aspect.

The rural areas of Bangladesh are inhabited by several semi-literate and illiterate people. e-Learning is the suitable ways to bridge the rural-unban gaps in terms of online learning habits. Furthermore, it can be reduced the effect of digital divide. It is an enormous challenge to enhance the basic education, literacy and livelihood of rural people for improving the socio-economic condition. It is worldwide expected that ICT can provide real value of life to such populations through ICT development within different information domains (Akther, 2010).

The literacy survey in 2010 shows that 57.53% population (aged 7 years and over) of Bangladesh are literate and that they can read and write. The total removals of illiteracy from the country are still far ahead and have to go a long way to reach the goal of 100% literacy. However, it is encouraging that the gap between males and females are narrowing down over the years. There have no exception of the expansion of ITCs and e-Learning to minimize the gap. The highest literacy rate for the age group 15-19 suggests that attainment of literacy is a recent phenomenon, and if the present trend continues, the substantial improvement in literacy will happen in course of time (Bangladesh Literacy Survey, 2010).

The use of internet facility in Bangladesh is very low and only concentrated among the higher educated group, which is extremely low for achieving the target of switching over to a digital Bangladesh by 2021. This, therefore, needs special attention. Use of electronic media and use of public places for literacy skill are still very low. Use of literacy skill in everyday life through reading and writing habits are not encouraging, which indicates that even the literate persons do not use their skills for further improving their skill (Bangladesh Literacy Survey , 2010). In Web-based e-Learning the roles of the Computer are three (i) Computer as tutor, (ii) Computer as Teacher, and (iii) Computer as Tutee. Thus, these mechanisms will be helpful to improving the kills through day to day activities.

No meaningful poverty alleviation by socio-economic development can be achieved by any nation without effective and efficient technical and vocational education system, since the level or nature of development in a country is often considered to be an offshoot of the nature of her educational program and system. Meaningful poverty alleviation through technical and vocational education cannot take place without adequate funding (Oseni, 2011). The Web-based e-Learning has become a feasible tool for facilitating education for a wide spectrum of participants using a variety of technologies. This study recommends to arrange the suitable technologies and to provide adequate fund to ensure electronic way of learning to cope up the demand needed for TVET in 21th century.

Despite technological limitations, Web-based e-Learning might be successfully implemented in Bangladesh and possesses the capabilities for overcoming many problems associated with traditional classroom based learning framework. Considering the rapid expansion of the usage of mobile communication devices in the country, development of technology and reduction in cost, well designed Web-based e-Learning framework is expected to contribute significantly in educational development and thereby having a long term effect on poverty alleviation (Alam, Kabir, & Elizabeth, 2003). The initiative can further be enhanced by exploring newer technologies like m-Learning to be incorporated into the program.

In a time of continuous economic, social and technological change, skills and knowledge become quickly out-of-date. And so need to take help from Web-based e-Learning. In the present circumstances, it is seems that

drop-out rate at the secondary level is quite high in Bangladesh. Furthermore, it is clear that inadvertently and haphazardly offering TVET programs not only increases the use of scarce educational resources, but also raises questions about the achievements of education, and may well make barrier to achieving national and individual educational aims (Alam, 2008). All the problems can be overcome by the proposed Web-based e-Learning integration.

According to Akber, (2005) to bring the e-Learning benefits to the people in Bangladesh, some important issues to be addressed and the key role of the players are identified as follows – (i) National strategy and plan for e-Learning where government has to play the lead role in partnership with academician; (ii) Ensuring access to the local communities i.e., development of ICT infrastructure, both government and private sector have to contribute in the process; (iii) Developing expertise on e-Learning teaching modalities for professional development, require more integrated approach and support for different stakeholders; (iv) Building partnership and cooperation among the stakeholders like academician, promoters etc. and between the regional and international networks to share the best practices, challenges and explore solutions; (v) Ensuring quality of the e-Learning materials, government institutions and academicians have to play an important role; (vi) Certification of the programs, academicians and government has to set the national strategies and criteria; (vii) Developing local relevant contents for local communities, government and development partners have direct role to play; (viii) Ensuring copyright and IPR issues; (ix) Promotional campaign to make aware of e-Learning facilities among the learners; (x) Developing organizational capacity of the developing countries, all stake holders have to contribute in the process.

References

Akber, M.S.U. (2005), "e-Learning in Developing Countries: Challenges and Opportunities Bangladesh Perspective", *Proceedings of the Second International Conference on eLearning for Knowledge-Based Society,* Bangkok, Thailand.

Akpomi, M. E. (2009), Entrepreneurship education for all students in higher education institutions in Nigeria: A means to sustainable development. *Journal of sustainable development in Africa* 11(1).

Akther, F. (2010), "ICT-Based Informal Learning Approach for Semi-Literate and Illiterate People in Rural Areas of Bangladesh", *Proceedings of the 7th International Conference on Networked Learning,* 2010, Edited by: Dirckinck-Holmfeld L, Hodgson V, Jones C, de Laat M, McConnell D & Ryberg T.

Akyempong, A.K. (2002), "Vocationalization on secondary education in Ghana". Washington, DC: World Bank.

Alam G.M. (2008), "The role of technical and vocational education in the national development of Bangladesh", Research and Evaluation Division, BRAC, Dhaka, Bangladesh , Received 23 May 2007; accepted in revised form 27 March 2008.

Alam, G.M. (2003), "The impact of students' involvement in party politics on higher education and national development in Bangladesh", Dhaka, Bangladesh.

Alam, G.M. (2007), "Private HE in Bangladesh: the impact on HE governance & legislation. *PhD thesis,* University of Nottingham, United Kingdom.

Alam, M.J.B.I; Kabir, S.M.L.I.; & Elizabeth (2003), "e-Learning in Bangladesh: implementation and evaluation" *a Pilot Project*.

Asia-Pacific e-Learning Alliance (2002), "e-Learning and Best Practices", Technical Report.

Bangladesh Literacy Survey (2010), Report on the "Bangladesh Literacy Survey", June 2011, Industry and Lobour Wing, Bangladesh Bureau of Statistics, Statistics Division, Ministry of Planning.

Best Practices (2001), *The Use of Native Language During Instructional & Non-Instructional Time*, 1-4.

Bose, K. (2003), "An E-Learning Experience: A written analysis based on my experience with primary school teachers in an *e-Learning pilot project, IRRODL*, 4,(2).

Cornford, J. (2000). "The virtual University is... the university made concrete?", Information, Communication and Society, 3(4), 508-525.

Daniel, J.S. (1998). "Mega-universities and knowledge media: Technology strategies for higher education", Kogan, London, 1998.

Education of Bangladesh (2012), Website: http://www.discoverybangladesh.com/meetbangladesh/education.html (Last accessed Jan. 2013).

Education Sector in Bangladesh (2012), Vocational Education Institutes: Website: http://www.ukti.gov.uk/export/countries/asiapacific/southasia/bangladesh/sectorbriefing/356900.html (Last accessed Jan. 2013).

Gay, L. R. & Airasian, P. (2003), *Educational Research,* Person Education, Inc., Upper saddle River, New Jersey 07458,131-132.

Human Development Reports (2010), The Real Wealth of Nations: Pathways to Human Development Website: http://hdr.undp.org/en/reports/global/hdr2010/(Last accessed Jan. 2013).

International Labor Organization (ILO)(2001), "Revised recommendation concerning technical and vocational education - 2001".

Lewin, K.M. (1993), "Education and development: The issues and the evidence research for the development for international development" (No. 6). London: Department for International Development.

Literacy Assessment Survey (2008), "Literacy Assessment Survey", Report, Bangladesh Bureau of Statistics; UNESCO; November 2008, Chapter-4, 37-42.

Martinez, M. (2003), High Attrition Rates in e-Learning: Challenges, Predictors, and Solutions, *The eLearning Developers' Journal,* July 14, 2003, 1-9.

National Education Policy (2010), "Education Policy of Bangladesh", Ministry of Education; Government of the People's Republic of Bangladesh.

Oseni, A. I. (2011), Technical and Vocational Education: Key to Poverty Alleviation in the Third World with Particular Reference to Nigeria, *Journal of Education and Practice*, ISSN 2222-1735 (Paper), ISSN 2222-288X (online), 2 (6), 64-68.

Osuji, F. (2004), Text of 2004 Ministerial Press briefing, Abuja: 29th June.

Pathan A.S.K. & Hassan M.M. (2005). Website: http://irep.iium.edu.my/591/1/EBPAT.pdf (Last accessed Jan., 2013).

Population estimation by UN stats (2008), "Estimate by UN stats" , Report-2008.

Population estimation report (2008), "Estimate 144,5 million by UN Stats", Report-2008.

Press, L. (1999), "Against All Odds, The Internet in Bangladesh", The MOSAIC Group, Fairfax, VA, March,1999.

Rahman, H., (2001), "Internet in Bangladesh: A Millennium Perspective", *Nepal IT Conference : Kathmandu,* Nepal, Jan 27 - 28, 2001.

Rahman, S. (2004), "An Overview of ICT and OSS in Bangladesh", *3rd Asia Open Source Software Symposium, Hanoi, Vietnam*, March, 2004.

Sehrt, M. (2003), "e-Learning in the Developing Countries; UN Chronicle, Digital Divide into Digital Opportunities".

UNESCO (2004), "meeting of higher education partners", Final Report, *World conference on higher education, Paris, UNESCO*, 23 – 28 June 2003.

UNESCO (2012), "Country Programming Document for Bangladesh" 2012-2016.

UNESCO, Actions Plan (2012), "Reaching the 2015 Literacy Target: Delivering on the promise" High level International Round Table on Literacy, UNESCO, Paris, 6-7 September 2012, 2.

United Nations Development Programme (2010), "HDR 2010 recognizes Bangladesh~s great progress over time".

United Nations Development Programme (UNDP) (1999), "Human development report". New York.

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2001), *Statistical yearbook.* Paris: UNESCO.

World Bank report (2012), "BTI 2012", Bangladesh Country Report in 2012.

World Bank. (1991), "Vocational and technical education and training", Washington, DC.

World Bank. (2002), "Economic growth and public policy: The East Asian miracle", Washington, DC.