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A Study to Explore the Practice of ICTs in TVET in Bangladesh and South Korea

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Abstract— *The purpose of the study was to review Technical & Vocational Education and Training (TVET) expansion with technologies, in particular to compare the present status of ICTs used in teaching-learning in TVET organizations both in Bangladesh and South Korea. The authors explored the current trends and issues of ICTs in teaching-learning in TVET mechanism on both of the countries. The structured questionnaires are used as data collection tools for knowing the current status of ICTs used in TVET in Bangladesh. Moreover, documents analysis techniques accomplished to compare the specific issues covered by the study. The issue ICTs in TVET is a broad phenomenon of comparison. Thus this study narrowed down five areas as specific criteria taken from the Survey report of UNESCO (2003) to pursue the study: (1) technology as curriculum, (2) technology as organizational mechanism, (3) technology as delivery mechanism, (4) technology as a complement to instruction, and (5) technology as instructional tools. The outcomes of the study revealed that the countries with more advanced economic should assist developing countries in establishing ICT infrastructure and capacity building in TVET; the open courseware initiative and public repository of learning objects must be encouraged to minimize the effects of the digital divide. Based on the findings and results of the document analysis the authors drew some recommendations to promote ICTs use in TVET in Bangladesh. The research theme would be beneficial for the scholars and practitioners of TVET of the countries.*

Index Terms— Information & Communication Technology, Technical & Vocational Education & Training (TVET).

I. INTRODUCTION

Globalization has created a new world order for doing business. New information and communication technologies (ICTs) have dramatically changed the way we live, learn, and work, and even think about work. The synergy of combining globalization with new technology has had dramatic economic and social impacts. It has created new opportunities as well as new challenges and uncertainty. Many workers have been dislocated, while a significant number of young people are structurally unemployed or underemployed. Skills polarization between so-called mind or knowledge workers and unskilled-low-knowledge workers has widened the gap in income inequalities. Youth, women, and older workers are the groups most affected. While these changes have brought about considerable challenges to Technical and Vocational Education & Training (TVET), they have created new opportunities for change and innovation. In the past the status and condition of vocational education did not match the importance of its potential contribution to society.

An ICT drives the new economy and human capital is its fuel. In fact, the ICT revolution makes knowledge a competitive resource. In this economic era, economic prosperity depends on brains rather than brawn and value is created by employing knowledge workers and continuous learning. ICTs can play a crucial role in removing distance from education and in developing a lifelong learning culture by TVET. In the contemporary era, a common underlying rationale is that changes in education of all levels and types are necessary to prepare citizens for life in the knowledge society, which is characterized by increasing globalization. This view is held not only in industrialized countries, but also in less developed countries [10]. Thus, the purpose of this comparative study is to increase collaboration between the countries and to creation and dissemination of knowledge and experiences in the common field of TVET.

Another prominent trend in education policy around the world is the increasing importance of, and changing perspectives on, the role of Information and Communication Technology. The introduction of computers in classrooms started around the early 1980s to give students opportunities for learning about ICT as a subject in the school curriculum. It was followed by an additional goal of bringing about more effective learning with ICT, including multimedia, the internet and the Web, as a medium to enhance instruction or as a replacement for other media. At this time, ICT did not significantly change beliefs about the approach to teaching and learning; but



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Volume 2, Issue 4, July 2013

during the early 1990s, policy priority for ICT use in schools began to shift towards learning through ICT. Moreover, ensure interactive and collaborative study environment to enhance learning. There is evidence from research that ICT can help students to learn and teachers to teach more effectively. However there is not a simple message in such evidence that ICT will make a difference simply by being used. The use of ICTs for administrative purposes, communication, curriculum development and assessment, career education and guidance, labour market information, job placement, and systems control, displaying specific features of various types of ICTs commonly applied in different spheres of technical and vocational education (TVE).

The article will focus particularly the use of ICTs in the arena of teaching and learning. The positive impact of ICT does not arise as an automatic consequence of IT adoption in the classroom. Rather, it requires significant change in pedagogical practice, including the roles of teachers and students [24],[4]. The Second International Information Technology in Education Study (SITES) introduced the concept of emerging pedagogical paradigm [20], to highlight the expectation that new pedagogical practices must accompany the implementation of ICT in teaching and learning if new goals of education are to be achieved.

II. ROLE OF ICTS IN TEACHING-LEARNING IN TVET

The increased use of ICTs in TVET has resulted in a major paradigm shift, from a total dependence on the objectivist paradigm to a growing adherence to the cognitivist and constructivist paradigms and the use of ICTs in distance education has resulted in a pedagogy, which is constructivist, collaborative and interactive [29]. ICTs are revolutionizing education by removing distance from education and making knowledge more accessible to all. Technology-enhanced learning will play a crucial role in the development of a lifelong learning culture and has the capacity to empower learners by providing them with multiple pathways that offer choices and channels to meet their education and training needs. Technology-based Learning (TBL) can enhance teaching and learning; it has the potential to become cost-effective as it offers greater flexibility regarding time and location of training delivery [9]. Additionally, it may facilitate institutional policy regarding access and equity [18].

Although ICTs are by far the most significant element undergirding the foundation of TVET, there is a paucity of literature and research regarding its implementation and use in this field of education and training. Attwell [2] noted: “whilst there is a wealth of studies and debate on the use of information and communication technologies (ICTs) in university and higher education, there has been only limited work on the potential impact for vocational education and training”. Even the database of UNESCO-UNEVOC International Centre for Technical and Vocational Education contained very limited information on the current use of ICTs in TVET. However, publications focused on general education were reviewed when no suitable TVET specific publications could be located.

III. SIGNIFICANCE OF THE STUDY

Besides the potential to providing education to anyone, anytime and anywhere, ICTs have encouraged new research and development in teaching and learning techniques in TVET system. As stated by Dean [7], Schank, the founder of Cognitive Arts, believes that educational institutions must adopt a new way of teaching. He claims that students “learn better through experiential and emotional learning rather than through memorizing names and dates” and thus educators must simulate real-world environments [7]. Technology can be used to facilitate these types of environments. An example of this is using flight simulators to train novice pilots. On the other hand, Aldrich argues that this type of learning is restrictive and instead believes in “the ant on the basketball model” where learners have the freedom “go wherever they want but stay in a finite world”. Courses would be customized to each user and provide a wide array of options, “like a computer game”.

As ICT is a new notion in the arena of Technical and Vocational Education. ICT tools had widely used in non-formal learning institutions with distance mode. The new ICT learning tools such as Notebook, SMART Phone with 3G, 4G, Pocket PC’s, etc. are expanding day by day. The Educationists' viewed that the arena of teaching-learning will be shifted quickly from the way of “Chalk & Talk” to “Touch & Teach” approaches. As today’s learners are rising up with computer in digital societies.

The comparative study is very essential in this regards to know the present status of ICT’s of developing country (Bangladesh) and developed country (South Korea). This study is focused the present status of ICTs in TVET of the two countries: the South Korea is one of the most famous countries in Asia in terms of its scientific and technological advancement. The science and technology education and ICT’s facilities of the country is enormous. On the contrary, Bangladesh is a dense populated country which is leapfrogging with the agenda of ICTs to



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implement the idea in the field of TVET. Thus, it is required to bridging the gap between the two countries with planning by digital information. It is very important in that sense of transferring knowledge and shear experiences by each other in the field of TVET. The outcomes of the study will help the curriculum specialist, instructional designer and policy maker to prepare the policy and program in future of the two countries.

IV. OVERVIEW OF TVET STATUS OF BANGLADESH AND SOUTH KOREA

The Pre-employment VET System: Primary responsibility for overseeing the pre-employment system rests with two agencies: the Directorate of Technical Education (DTE) and the Bangladesh Technical Education Board (BTEB). DTE is responsible for setting the overall policy framework of the entire vocational education and training system. BTEB, a statutory agency, is responsible for maintaining the qualifications framework for VET: setting training standards (and relevance to the labour market), student assessment, certification of results, and accreditation of institutions. BTEB covers all accredited institutions, both government and non-government institutions. The VET system is comprised of three levels. The first level, basic skills, is a two year course focusing on manual skills. It is offered both inside and outside of schools. Prospective students must have completed grade VIII. At the certificate level, the two-year Secondary School Certificate, SSC (Voc), covers a similar set of skills and also requires grade VIII completion. Students may proceed beyond the SSC (Voc) to the Higher Secondary Certificate, HSC (Voc), requiring an additional two years of secondary schooling after grade 10. At the post-secondary level, there are four-year diploma-level courses, which are offered through polytechnic and monotechnic institutions (such as the Textile Institutes). While such nomenclature is not commonly used in Bangladesh - the basic skills and certificate level courses can be classified as vocational education, while the diploma level courses are equivalent to vocational (postsecondary) training. Non-government agencies also provide non-accredited training, though there are no estimates of the size and scope of their operations nationwide. Several NGOs and private providers provide basic skills and training to target groups such as youth, the under privileged, and the rural population.

Training within Industry: The incidence of training among firms is low, especially as compared to other countries – particularly in East Asia. While data from Bangladesh show that training has a positive impact on productivity and worker wages, only 25% of manufacturing establishments in Bangladesh provide their employees with in-service formal training. Training ‘in-house’ and in vocational schools are the predominant sources of training. About 18% of enterprises report having in-house programs and 13% report external training. Firms tend to report vocational schools (31%) and private sector partner firms (26%) as the most important sources of external training. While the incidence of training remains low, some interesting initiatives have emerged. The Bangladesh Garments Manufacturers Export Association (BGMEA) has established a fully self-financed training institute of its own, the BGMEA Institute of Fashion and Technology (BIFT) to meet the requirements of its industry, including the need to “increase the efficiency, productivity and product value of the industry.”

Financing of Vocational Education and Training: The Government is the major financier of vocational education and training. Government funds are used to finance public sector institutions and to provide subsidies to private providers at the vocational education level. Students also contribute to TVET financing by paying tuition and examination fees.

Outcomes of the VET System: The quality of the system seems low as evidenced by low capacity utilization and low passes rates. In both vocational education and vocational training institutions, close to half the student capacity remains unutilized. At the same time, pass rates in standardized examinations have also dropped significantly over the past few years. They suggested that the government be more proactive in involving them in the management of the system to ensure that VET was responsive to their needs. Students feel that if employers were more involved in the design of training and use ICTs for this purpose they would find it easier to find jobs. The constraints faced by Bangladesh in TVET mechanism were the insufficient financial support to develop ICT facilities and the extension of internet access, some technology illiterate teachers, low incentives for teachers to take ICT training, low frequency of regular turn off electricity, and unavailability of computers used by students in learning.

VET of Republic of Korea: The strong performance of the economy in the Republic of Korea during the last thirty years has been well publicized. Technical and vocational education played a pivotal role in this rapid industrialization process. The government successfully restructured the vocational education and training system to meet the changing industrial demands. However, the country now faces new challenges posed by the changing global economic environment. In order to sustain its competitiveness, the Korea must now take active measures to reform its technical and vocational education programs. In the Republic of Korea, technical and vocational education programs within the formal education system are provided at both senior secondary schools and



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Volume 2, Issue 4, July 2013

post-secondary institutions (junior colleges). Out-of-school vocational training is provided as non-formal education.

Vocational senior secondary schools: Vocational senior secondary schools provide three-year programmes, preceded by six years of primary education and three years of junior secondary education. The programmes can be divided into six categories: agricultural, technical, commercial, marine and fisheries, vocational and comprehensive. The duration of field training varies, ranging from one to six months in agricultural and commercial schools, one to twelve months in technical schools and from three to twelve months in fishery and marine schools. Vocational senior secondary schools are the major institutions for training the craftsmen and skilled manpower in the Republic of Korea. In 1997 there were 771 technical and vocational senior secondary schools with a total enrolment of 960,037, which accounted for about 40% of the total senior secondary school enrolment.

Junior vocational colleges: Junior vocational colleges provide two-year post-secondary programmes, with the exception of the marine and fisheries, and nursing courses which last two-and-a-half years and three years respectively. The purpose of junior college education is to produce middle-level technicians equipped with a solid base of theoretical knowledge and practical skills to meet the increasing demand for technical manpower following rapid industrialization. Specialized programmes are grouped into technical, agricultural, nursing, fisheries, health, commercial and business, home economics and so on. In 1997 there were 155 junior colleges with an enrolment of 724,741, about 28% of the total higher education enrolment.

Non-formal vocational training: Non-formal vocational training comprises public and private training. Public vocational training is undertaken by the Korea Manpower Agency (KOMA) under the Ministry of Labour and local governments. It aims to train semi-skilled and skilled workers through programmes lasting from three months to two years. KOMA manages institutes concerned with a broad range of occupations, while local governments concentrate on training in trades necessary for increasing the income of farm households.

Vocational training: Private vocational training is conducted by enterprises and corporations. Enterprises are required to pay employment insurance fees, the latter depending on the number of employees. The fees paid by the enterprises are pooled into a central fund, known as employment insurance funds that are used to finance the vocational competency development programmes. Private training is also carried out by corporations authorized by the Ministry of Labour. The vocational training courses are divided into 'basic training', 'upgrade training', 'job transfer training', and 'retraining,' according to the objective of the training. The programmes are provided in 477 fields covering 23 technical areas.

Present status of TVET in Korea: The Student enrolment in TVET system in Korea was 45% (1970-1980) in technical-vocational high school level. It decreased from 45% (1980) to 27.7% (2006). The employment rate of vocational high school graduates decreased from 76.6% (1990) to 25.9% (2006). Almost 69% of the graduates entered to tertiary education in 2006. The identities of vocational high schools were questionable. The demand has shifted from technical-vocational high school to junior technical college. The priority shifted (1980~2000) from TVET toward science technical education as Korean economy focus the new technology industry. The government budget for technical-vocational high school increases 18%~22% and in 2000's it was 20.2%. As Korean economy utilizes new technologies, technical-vocational high schools face identity crisis. As economy grows and develops, the demands of TVE and job competency are changing. The demand of simple, low level, technical competency decreased and the demand of higher level, multi-tasking job competency increased.

V. EXPLORATIVE ANALYSIS ON THE PRACTICES OF ICTS IN TVET

Research had conducted using ICTs in teaching-learning in TVET of Bangladesh in 2010. The *Likert Scale* Technique and *Chi-Square* test used to analyze the opinions collected from the TVET teachers' on the specific questions provided by structured questionnaires. The following tables (I-IV) are showing the results of determine the present condition of using ICTs in teaching-learning in TVET in Bangladesh. In this research, the total numbers of responses (TVET teachers) were 106.

Table I. Seeking the importance of ICTs in teaching-learning in TVET in Bangladesh

No	Description	5	4	3	2	1	W.A.	χ_0^2	Remarks
a)	ICT is very much helpful for improving the techniques of teaching-learning process in	75 (71%)	27 (25%)	3 (3%)	1 (1%)	0 (0%)	4.66	173.07	Strongly Agree



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Volume 2, Issue 4, July 2013

	TVET								
b)	Using ICTs, teaching-learning will be easier, interesting & time saving.	48 (45.28%)	53 (50%)	4 (3.77%)	1 (0.94%)	0 (0%)	4.40	149.79	Agree
c)	Students will be more motivated to learn if ICT tools are used in TVET.	60 (56%)	40 (38%)	6 (6%)	0 (0%)	0 (0%)	4.50	151.79	Agree
d)	ICT tools are too complicated to use in teaching-learning process.	10 (9.43%)	26 (24.53%)	12 (11.32%)	35 (33.02%)	23 (21.70%)	2.67	103.45	Undecided

At 0.05 Level of significance, $\chi^2_c = 9.49$ (df = 4)

Findings on the responses:

- “ICT is very much helpful for improving the techniques of teaching-learning process in TVE”* is Strongly Agree (WA= 4.66). Whereas $\chi_o^2 > \chi_c^2$ (173.07 > 9.49) which indicates that the response is significant.
- “Using ICTs, Teaching - Learning will be easier, interesting & time saving”* is Agree (WA= 4.40). And $\chi_o^2 > \chi_c^2$ (149.79 > 9.49) which indicates that the response is significant.
- “Students will be more motivated to learn if ICT tools are used in TVE”* is Strongly Agree (WA= 4.50). Whereas $\chi_o^2 > \chi_c^2$ (151.79 > 9.49) which indicates that the response is significant.
- “ICT tools are too complicated to use in T- L process”* is Undecided (WA= 2.67). Whereas $\chi_o^2 > \chi_c^2$ (103.45 > 9.49) which indicates that the response is significant.

Table II. Use of ICTs in teaching-learning in TVET (N=106)

No	Description	5	4	3	2	1	W.A	χ_o^2	Remarks
e)	ICTs are essential for improved TVET system in Bangladesh	62 (58.49%)	41 (38.68%)	3 (2.83%)	0 (0%)	0 (0%)	4.56	157.42	Strongly Agree
f)	Government has enough policy to improve the present condition of ICT in TVET in Bangladesh	18 (16.98%)	34 (32.08%)	41 (38.68%)	11 (10.38%)	2 (1.89%)	3.52	115	Agree

At 0.05 Level of significance, $\chi^2_c = 9.49$ (df = 4)

The responses regarding

- “ICTs are essential for improved TVET system in Bangladesh”* is Strongly Agree (WA= 4.56). Whereas $\chi_o^2 > \chi_c^2$ (157.42 > 9.49) which indicates that response is significant.
- “Government has enough policy to improve the present condition of ICT in TVET in Bangladesh”* is Agree (WA= 3.52). Whereas $\chi_o^2 > \chi_c^2$ (115 > 9.49) which indicates that the response is significant.

Table III. Present status of ICTs in TVET mechanism; (N=106)

No	Description	Yes	No	χ_o^2
g)	Do you think that ICT tools can be used for enhance learning in TVET?	1 (99.06%)	1 (0.94%)	102.04
h)	Do you use any ICT tools in teaching-learning?	69 (66.09%)	37 (34.91%)	9.66
i)	Do you encourage your students to use ICTs for their learning?	97 (91.51%)	9 (8.49%)	73.06
j)	Do you have any ICT based laboratories in your institution?	34 (32.08%)	72 (67.92%)	13.62

At 0.05 Level of significance, $\chi^2_c = 3.84$ (df = 1)



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Volume 2, Issue 4, July 2013

The majority TVET teachers in Bangladesh are motivated to use ICTs in education. The TVET teachers (99.06%) are very much inspired to introduce Information & Communication Technologies to enhance teaching learning. It's the encouraging move that will improve the quality of the TVE system in Polytechnic institutions in Bangladesh. Now a day's teachers are using ICTs in their teaching learning process and also exhilarated the students to use accordingly for improving their learning.

Table IV. The factors limiting the use of ICTs in TVET (N=106)

Factors	Teachers Opinion	Percentage
Lack of Knowledge	50	47.17%
Absence of skill	45	42.45%
Deficiency of training	80	75.47%
Shortage of modern ICT tools in Class	75	70.75%
Nonexistence of awareness	50	47.1%

N = 106

The information's of table- 4 reveals that no factor has the supreme majority for limiting the use of ICTs in teaching situation in technical & vocational education and training institutions in Bangladesh. That means all factors tabulated in the table have the greater role for limiting the use of ICTs in TVE sector of Bangladesh. However most of the teacher's opinions lack of training (75.47%) limits the use of ICT tools in education. This section is going for comparison the use of ICTs in teaching-learning in Bangladesh (developing country) and South Korea (developed country).

In fact, teaching learning in TVET organizations based on ICTs are an extensive case of exploration. Thus document analysis has taken place in this study. Moreover, this study has chosen the following criteria for comparison, cited by the *analytical survey report of United Nations Educational, Scientific and Cultural Organization (UNESCO) in 2003*[28]. A summary of results of the documents analysis provided with detail implications in the five specific areas of ICTs used in teaching-learning in TVET. (i) Technology as curriculum ; (ii) Technology as organizational mechanism; (iii) Technology as delivery mechanism; (iv) Technology as a complement to instruction; (v) Technology as an instructional tool.

Comparing: Technology as curriculum: When using technology as curriculum the focus is on developing ICT literacy skills. There are two types of ICT literacy skill sets. The first is *generic ICT literacy skills* such as keyboarding, word-processing, using databases, using spreadsheets, desktop publishing and using the Internet for research and communication [14]. The second ICT skill sets are the *occupationally specific ICT literacy skills*. In Bangladesh the TVE institutions learners have the generic ICT skills properly but there have the shortage in occupationally specific ICT literacy skills in some branches of TVET. But the Korean TVET schools are information richer and the learners as well as the teacher have the generic ICT skills and occupationally specific ICT literacy skills.

Comparing: Technology as organizational mechanism: Various approaches to research can be found in studies of innovations involving ICT use in TVE Schools. These include studies of enabling factors associated with success [1], [6], [26] and studies on barriers to implementation [30], [25]. Some studies have considered the implementation in the context of whole schools [23], [15] while others have examined the effects of government policies and other external influences [26]. Studies have also focused on the attitudes and needs of individual teachers in relation to using computer for teaching and learning [5], [22]. To improve the condition of ICTs in classrooms TVET organizations in Bangladesh require adequate time as it has many constrain like economy, infrastructure and electricity. At present, the simple ICT tools with widespread software like Graphics software, Presentation software, Desktop publishing, Discipline-specific programmes, Simulations, Authoring software are used in TVET organizations in Bangladesh. It may be defined as a tangible product or procedure that is new and intentional, and that aims to lead to benefit [3]. Reforms refer to innovations which are typically initiated from the top of organizations or from the outside [6]. Now-a-days Korean TVET organizations are broadly used the Productivity software, Word processing, integrated software, Spreadsheet, Database, Graphics applications. The administrative task of TVET organization in Bangladesh is not fully ICT-based. The administrative tasks are depending upon the use of different software's when it will be ICT-based and that have at TVET institutions in



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Volume 2, Issue 4, July 2013

South Korea.

Comparing: Technology as delivery mechanism: When technology is used as a delivery mechanism the focus is on packaging course content for digital delivery. Common approaches in current use include: computer-assisted instruction (CAI), computer-based instruction (CBI), and web-based or online instruction. Open and Distance Learning programmes make extensive use of technology as their delivery mechanism. The TVET in Bangladesh use CAI and CBI especially for skill training of the TVE trainers and also used those in the Laboratory classes. The Web-based or online instruction in TVET system in Bangladesh is leapfrogging. In Korean TVET institutions used CAI, CBI, e-Learning extensively. Till now, Bangladesh has no e-Learning system in TVET organizations. The Korea has the non-formal TVE organizations and they use Web-based and online instruction extensively.

Comparing: Technology as a complement to instruction: The power by technology, fuel by information and drive by knowledge is called ICTs. Both Bangladeshi and South Korean TVET system uses the ICTs to complement instructions as their demand increased. When teaching technologies are used to complement instruction the emphasis is on providing opportunities to practice skills taught and extending learning by working with specific software applications [14].

Comparing: Technology as an instructional tool: The learning process can be divided into two broad categories. The first *relates to learning conditions* that are internal to the learners. While this is the area where the potential to improve learning outcomes is the highest, it is undoubtedly the area that is most difficult to affect. The second condition of learning is *external to the learners*. People learn through the five senses and the contribution of each to the amount that the people learn varies. Following is estimated amount of learning from the five senses [17] Taste: 1% , Touch: 1.5% , Smell: 3.5% , Hearing: 11% , Seeing: 83%. Imel [13] proposed guidelines for using ICTs in TVET: (i) Let learning outcomes drive the process of technology choice-technology is only a tool therefore teachers must use technology as part of a total instructional plan; (ii) Strive to infuse and/or integrate technology into instruction and curriculum; (iii) Use the technology to shift the emphasis from teaching to learning; (iv) Be prepared to modify the role of the instructor- the teacher is not the only source of information; and (v) Use technology to move the focus away from low-level cognitive tasks to higher order thinking skills.

Why is South Korean' TVET system excellent than Bangladesh in terms of ICT practices?: After document analysis the study revealed some characteristics make a Korea' system superior such as the (1) excellent infrastructure of ICTs in TVET organizations, (2) sufficient financial assistance, (3) availability of Software for TVET learners, (4) excellent Internet speed for uploading and downloading e-Learning materials, (5) well-trained teachers and staffs in TVET organizations. The TVET organizations in Bangladesh suffered as: (1) 75% people lives in Rural areas and most of the TVET organizations are there, thus, infrastructure of ICTs are not up to the mark as the load shedding of Electricity, (2) a developing country financial crisis are not uncommon, (3) deficiency of updated software, (4) there have no broad band internet except some kinds of MODEM and CD-ROM used in TVET classrooms, (5) a lack of ICT skills of the instructional staffs, inadequate motivational techniques to increase the interest to learn. Also (6) lack of training of the teachers on ICT is a major barrier to improve the quality of TVET.

VI. RECOMMENDATIONS AND CONCLUSION

ICTs are to reduce the knowledge gap and disparities between developed and developing countries; there is a need for more developed countries to assist developing countries in implementing the use ICTs in TVET; UNESCO and ILO [27], [12], [8] acknowledged that international cooperation in TVET is critical "as a means of narrowing disparities between North and South and as a bridge to a more prosperous and peaceful future". Depending on the research findings as outlined in the Chapter-V and the discussion on emerging factors resulting from the evidence of gathered data, the researchers formulated recommendations for future actions to achieve greater impact in areas of teaching-learning in the TVET institutions of Bangladesh:

- 1) ICT tools should be provided to each polytechnic institution so that each of the teachers gets facility to utilize those in classroom;
- 2) Teachers should encourage the students to use ICTs for interacting and collaborating purpose to enhance learning;
- 3) Government should provide enough funds according to the requirement of ICT tools and machineries for each classroom. Every teacher should have at least one computer with internet connection;
- 4) Motivation is a critical factor in ICT adoption. Policies in this area should include measures raising the confidence levels of the teachers (by giving appropriate in-service and initial teacher training on ICTs)



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Volume 2, Issue 4, July 2013

and also by rewarding them for the use of ICTs. Government should take proper policy to train the teachers about ICTs.

South Korea hosts a UNESCO Centre of Excellence in TVET. Although the country has successfully reengineered TVET system to meet changing industrial demand and to sustain the competitiveness of the nation. Lee [1] also advocated the use of ICTs in TVET. Porter, Doszpot and Maxwell [21] also suggested that putting appropriate TVET course online should be a priority for South Korea. In Bangladesh most of the TVET institutions have no good access of Internet to facilitate learning; the investment must allow in Bangladesh in TVET to acquire machines and equipment that are used in the workplace; compulsory computer literacy must be implemented in TVET [19]. TVET teachers both in Bangladesh and South Korea need to keep up to date in order to maintain their occupational literacy skills. Those involved in the integration of ICT-mediated learning need training in the pedagogical applications of ICTs for teaching and learning. Students also need a set of ICT literacy skills in order to succeed in ICT-mediated learning environments. Countries with more advanced economies need to assist developing countries in establishing the necessary ICT infrastructure and capacity building in TVET. The open courseware initiative and public repository of learning objects must be encouraged to minimize the effects of the digital divide. There are many barriers that hinder the use of ICTs into teaching and learning in TVET system. The most significant are infrastructure, availability of suitable materials, job threat, appropriateness of the methods, and credibility of programme content. Although there are some anecdotal records of successful attempts regarding the use of ICTs for teaching affective and practical skills, there is no hard evidence in support of these claims.

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