

An Evaluation of the Curriculum of Electronics Trade Courses in Bangladesh

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Abstract

The aim of the study is to evaluate the curriculum of electronics trade courses in Bangladesh to find the cause of trainee shortage in these courses and the gap between courses on offer and the most demanded competencies by industries in the subsector. Among the responsive electronics firms in this study, 78% were involved in assembling, repairing and servicing jobs, rather than in one specialized activity. Their demand for service oriented workforce (77%) is higher than the production oriented workforce (23%). The workforce at present is predominantly male (80.53% male against 19.47% female). The education level and training for the largest group of the employed workforce are HSC and below HSC with some skill training (44%). The next largest groups comprise Diploma in Engineering (25%) followed by Degree in Engineering or above (6%) and General Degree and above (3%), respectively. In respect of new workforce recruitment, a significant number of workers (22%) are employed without any prior technical training, but are given in-house or unstructured apprenticeship training in the workplace after recruitment.

According to frequency of mention by employers, gaps in skills identified at initial recruitment were the lack of core skills (25%), which was ranked as the largest skill gap, followed by the lack of common/sector specific skill, basic/generic skill and work experience with 20%, 15%, and 17% frequency of mention respectively. In both the public and private TVET providers' trade courses, it appears, the curriculum format, course contents and clustering of competencies do not match the demand of the industries. The existing trade courses are not designed according to the changing demand of the industry. The clustering of the competencies in the trade courses does not appear to be responsive to employers' needs. The combination of core, common and basic competencies in training courses in terms of knowledge, skills and attitude does not reflect the employers' expectations.

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An extensive analysis of the supply and demand data, comparative features of the curriculum, and an FGD with employers indicated a profile of job-specific skills in demand, which included: (1) Mobile phone and consumer electronics servicing (2) Solar system installation (3) Printing machine servicing (4) TV & multimedia servicing and (5) General electronic servicing.

Key words: Electronics trade courses, Mismatch of skills demand and supply, Employers' expectations.

I. Introduction

The electronic trades workforce in Bangladesh is an important contributor to productivity and services in various private companies and public organizations. The sub-sector is significant in spurring economic growth. Yet, there appear to be gaps between demand and supply in knowledge, skills and attitudes in this sub-sector. Government organizations such as Bangladesh Technical Education Board (BTEB), Directorate of Technical Education (DTE), Bureau of Manpower Expatriate Welfare and Training (BMET), Bureau of Non-Formal Education (BNFE) and other 19 Ministries and agencies are involved in skills development directly and indirectly. Some NGOs and international organisations including Under-privileged Children's Education Program (UCEP), Mirpur Agricultural Workshop and Training School (MAWTS), Dhaka Ahsania Mission (DAM) and others also play important roles in the field of training courses at the certificate level with duration from 3-6 months to 1 year (Faruq, 2010).

At present training providers under BTEB and other non- accredited institutions are facing shortages of trainees in some specific electronics trade courses, though these courses were popular and enjoyed good employment prospects in recent past. At the same time, employers complain of workforce shortage in terms of both numbers and quality. In these circumstances it is important to understand the paradox of supply and demand in this sub-sector.

Basic Trade Courses under BTEB are popular vocational training courses in Bangladesh. These are at the pre-NSS or basic level of National Skill Standard (NSS). According to the self-supporting evening trade programme manual of Dhaka Polytechnic Institute (1977), the evening trade programme was introduced in Dhaka Polytechnic Institute from January, 1976. The then first trade course was general mechanics of 2 years' duration and the number of trainee was 93. By July 1977, the total trainee enrollment shot up to 2,391 in 30 different trade courses under 7 different engineering departments. Dhaka Polytechnic Administrative Council was the certificate issuing authority. Later in 1992, BTEB took the authority for controlling, evaluating and issuing certificate of this program and integrated these courses with the National Skill Standard (NSS). Initially the duration of these courses under BTEB was 6 months and were implemented mainly by various technical training centers under BMET and Polytechnic Institutes. (Mia, 2010)

The Basic Trade Courses under BMET now have been restructured as 360-hours courses to be completed within 3 or 6 months. Polytechnic institutes run these courses in the evening shift as self-financed short courses. Basic Trade Courses became popular after the introduction of Computer and Information Technology courses in 5 different trades. Beside these BTEB affiliated basic trade courses there are a number of NGOs which are also offering training courses of 3 or 6 months' to 1 year duration. Bangladesh Knit and Textile Training Centre (BKTTTC) under BMET also provides one year skill certificate courses on 6 different trades, affiliated with BTEB (BTEB, 2012).

BNFE is a public non-formal education agency under the Ministry of Primary and Mass Education (MoPME), which also has some projects on TVET for youth with limited formal education. The electronics related trade course of BNFE are: radio-TV servicing, computer & mobile phone servicing, printer & photocopier servicing of different duration from 6 months to 9 months. They offer these courses in urban and rural areas through selected NGOs.

UCEP is one of the major training providers in this sub sector and is comparatively more structured and organized than the other NGOs. The electronics related trade courses of UCEP are Electronic Technology and Industrial, Electrical and Electronic Control of one year duration comprising two semesters (Ahmad, 2012)

There are some training centers in Dhaka city which also provide training in electronics mostly for underprivileged children financed by Save the children in Bangladesh. In most cases they follow the curriculum of UCEP but recently they have also developed their own curriculum for the electronics technology and mobile phone servicing. Besides this, Dhaka Ahshania Mission, Muslim Aid Institute and MAWTS provide training in electronics trades courses. Some government owned non formal training institutions run by the Social Welfare Department, Youth Development Directorate and Women Affairs Directorate are also providing short training in different electronics courses in Bangladesh.

Another source of training is the informal sector, where the trainees, specially the underprivileged children, are attached with a commercial engineering workshop or industry as an informal apprentice, working as helpers. After 6 months to 2 years of attachment with these workshops, they acquire skills, but without recognition from any formal accreditation body/agency. There are hundreds of such small electronics workshops in Dhaka city and all over Bangladesh. This is one of the prime sources of skilled workforce even for some established electronics industries like Rangs Electronics.

II. Research Objectives and questions

In order to meet the competencies and qualification requirements of the national and international job markets, the TVET curricula should be responsive, effective, realistic and relevant. The objectives of this research are to:

- i) Identify the job competencies that are most in demand in the electronics sub-sector;
- ii) Carry out an analysis to determine the gap between the existing curricula and industry demand; and
- iii) Prepare a map of potential market-responsive trade courses to be offered by vocational training centers in the electronics sub-sector

The background, issues and objectives presented above lead to the following specific research questions:

- 1) Are the skills/competencies of the existing trade curriculum relevant for industry requirements?
- 2) What are the causes of trainee shortage in existing electronics trade courses in Bangladesh?
- 3) What are the deficits/gaps in the present curriculum of electronics trade courses?
- 4) What are the most demanded trade courses in the electronics sub- sector?

III. Research Methodology

The study was conducted in Dhaka city and adjacent areas. A purposive sampling method was used for the study. A total 40 large, medium and small electronics enterprises were identified in Dhaka city and adjacent areas. Competencies demanded in these industries and other relevant primary data were collected from 13 different enterprises ensuring that at least three belong to each of the large, medium and small categories. At the same time, 6 in-house training providers and 17 training institutions offering electronics trades courses under BTEB were identified. Among these 10 training providers/institutions responded to invitation to join in a focus group discussion (FGD). A questionnaire was used for primary data collection from the training providers. Secondary data were collected from contacts with different training providers and their websites. Collected data were analyzed combining both quantitative and qualitative methodologies.

IV. Result and Discussion

Analysis of Primary data

The study focused on three major issues regarding the skill gap: (1) skills and competency requirement/demand of the industry; (2) quantitative and qualitative gap between the curriculum contents and industry requirement – mismatch of demand and supply, and (3) appropriateness of the trades courses and their contents. Data collection focused on type of services/products of the enterprises; characteristics of their workforce including education and training; status, type and levels of skills required on the job; duration of the required training; criteria and difficulties in selection and recruitment of workers; and identifying deficits in required basic, common and job-specific skills/competencies.

General findings

Out of the 13 responsive electronics firms, 8 are private limited companies and 5 are proprietary in their nature of ownership. Among these, 3 are involved in production, 6 are service oriented and 4 are involved in both production and servicing. The main jobs of the firms include assembling, servicing and repairing and maintenance. Only two are involved in manufacturing including design and development of products. Out of the 13 firms, 7 are mainly concerned with assembling and servicing TV, DVD, IPS, UPS and Voltage Stabilizer. Some of them are also involved in distribution and support of consumer electronic products and home appliances. One is working on solar system distribution and servicing and another is engaged in designing, developing and manufacturing microcontroller based system for selected products.

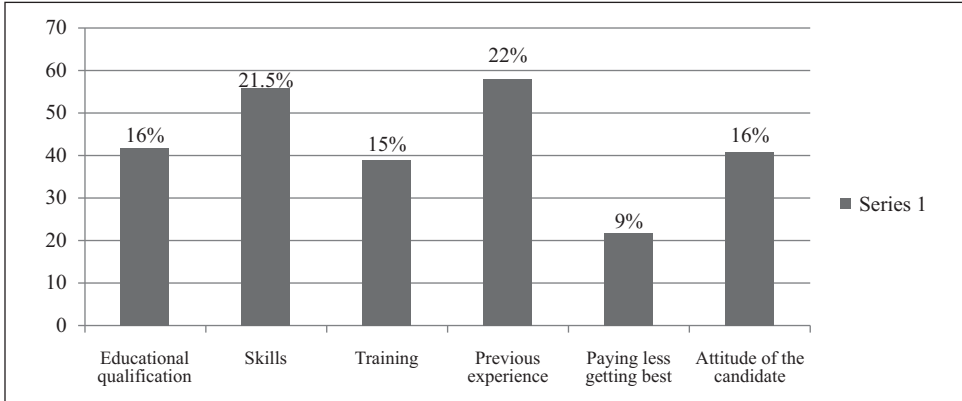
The education qualification levels of the employed workforce are as follows (Table 1).

Table 1: Percentage distribution of education and training levels of workers in electronics industry in Dhaka city and suburbs (N=1,200)

Education and Training level	Percentage of the workforce
Below class 8 without training	2.6
Below class 8 with training	1.3
Below SSC or equivalent without training	13.5
SSC/equivalent without training	2.7
SSC/equivalent with training	14.2
HSC/equivalent without training	3.2
HSC/equivalent with training	28.5
Diploma in Engineering	25.6
Degree Engineering/above	5.6
General Degree and above	3.4

According to the newly adopted National Technical and Vocational Qualifications Framework (NTVQF) skill level classification, among the employed workforce in electronics sector, only 1% are considered unskilled. The supervisors/employers ranked their workers including themselves under following skill levels : basic skilled – 3%; medium skilled – 6%; semi – killed – 16%; skilled – 43%; highly skilled/ supervisors – 18%; and mid-level managers/supervisors – 7%. The remaining 7 percent were considered high level professional managers.

In the case of workforce recruitment criteria, highest value was assigned by employers to previous work experience (22.5%), followed by skills level, educational qualifications, attitudes, and skills training. A small proportion of employers (9%) seemed only to be interested in paying the least to workers. This seems to be the pattern especially in the growing electronic printer and photocopier servicing firms. (See Figure 1)

Figure 1. Criteria followed by employers in recruiting workers in electronics industry

V. Skills Gap

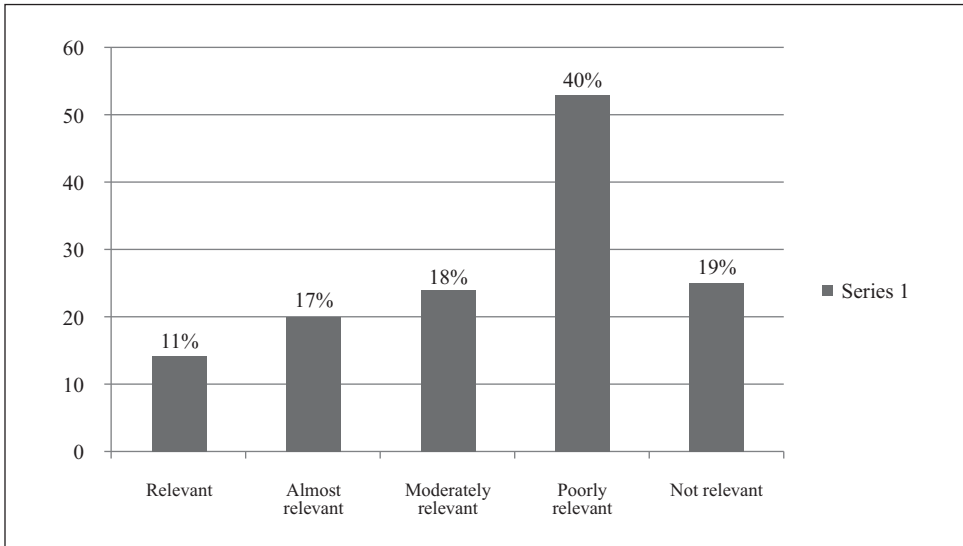
One of the important relevant findings from this research is the type and cause of skills gap. The lack of core skills (ability to handle a range of tasks specific to electronics trades) ranked as the highest type of skills gap as noted by employers during initial recruitment. Common skills, on the other hand, refer to ability to handle common tasks across jobs in the industrial trades such as common mechanical, electrical and chemical applications as well as handling of materials, and safety and security at work. Deficiencies in common skills among job seekers were the next serious gap after core skills according to employers. Basic or generic skills refer to basic competencies required in all work-related situations such as, reading, writing, counting, basic knowledge of science and basic social interaction. This was also seen as a significant deficiency.

The lack of common skills, basic skills and work experiences was mentioned by 20%, 15%, and 17% respondents, respectively. On the other hand, overall lack of skills ranked as 16% and insufficient applicant information ranked as 7%. These data suggest that the training centers/providers do not produce workforce with sufficient core and common skills, and they do not do enough to remedy the basic/generic skills deficits of trainees. The employers do not seem to have confidence in the training provided by the training providers.

Relevance of the curriculum

When employers were asked to give their views about the relevance of the training curriculum in vocational and technical training and trades courses, the responses were not positive. Almost 60 percent thought that the training curriculum and contents were either not relevant at all or poorly relevant for the job market (Figure 2).

Figure 2: Employers views about relevance for job market of training in electronics trade courses (Percentages of responses; n= 13 employers)



Analysis of job requirements/competencies demand

The main objective of this research was to ascertain the most demanded skills of workers in the electronics enterprises. Aiming at this objective, prospective core job requirements /competencies were listed in a questionnaire and employers were asked to rank the competencies according to their perception of requirements, as shown below (Table 2).

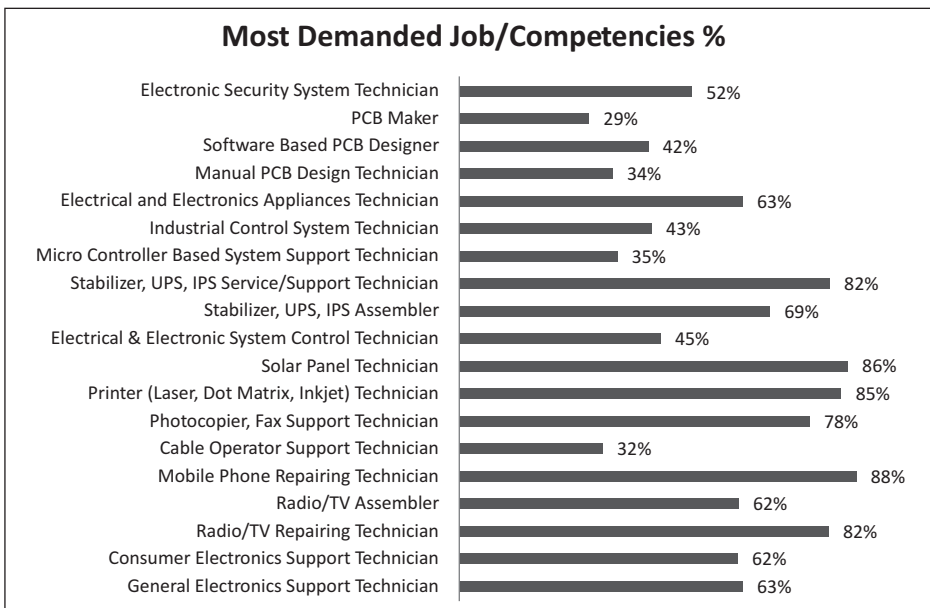
Table 2: Demand of core competencies in electronics jobs as perceived by employers (Expressed by ranking highest to lowest, 5 to 1, respectively)

Demand of Core Competencies in electronics jobs/Survey respondents	Grammen Bitek Ltd	Rahim Afroz	Butterfly Marketing Ltd	Royal Power Company Ltd.	Limo Electronics Ltd.	Rangs Electronics	Solar Television	Rain Computers	JAN ASSOCIATES	PC DOT TECH	Queue Technologies	Microprocessor Institute	Allied Solar Energy Ltd	Total=13x5=65	Percentage
Support General Electronics appliances	3	5	4	3	4	2	3	4	3	3	4	2	1	41	63
Support Consumer Electronics appliances	4	5	3	5	5	3	3	2	3	2	3	1	1	40	62
Repair Radio/TV	2	4	5	4	5	4	5	5	4	4	4	3	4	53	82
Assemble Radio /TV	2	3	4	3	5	4	5	3	2	3	3	2	1	40	62
Repair Mobile Phone	4	4	4	4	4	5	5	5	4	5	5	4	4	57	88
Support Cable Operation	1	2	1	1	1	2	2	1	2	3	3	1	1	21	32
Repair Photocopier and Fax	4	4	3	4	4	3	3	4	4	5	5	4	4	51	78
Repair Printing Machine (Laser, dot matrix and Inkjet printer)	4	4	4	4	4	4	3	5	5	5	5	4	4	55	85
Support and service Solar Panel system	5	4	4	4	4	4	5	5	4	4	4	4	5	56	86
Support Electrical & Electronic system Control	2	4	2	4	2	2	2	1	2	3	2	2	1	29	45
Assemble Stabilizer, UPS and IPS	4	3	2	3	4	3	4	2	4	3	5	5	3	45	69
Service/Support Stabilizer, UPS, IPS	4	5	3	5	4	3	3	5	5	4	5	3	4	53	82
Support Micro Controller based system	2	1	1	2	2	2	1	2	2	3	2	2	1	23	35
Maintain Industrial Control System	2	2	1	3	2	3	2	2	2	3	2	3	1	28	43
Support Electrical and Electronics Appliances	3	5	4	3	3	3	3	1	2	3	4	3	4	41	63
Make Manual PCB	2	1	1	1	2	2	2	1	1	4	2	2	1	22	34
Design and make Software based PCB	4	1	1	1	1	2	1	2	5	3	2	2	2	27	42
Support Electronic security system	5	3	2	2	2	3	3	1	2	2	3	3	3	34	52
Others	1	1	1	1	1	2	1	1	3	2	2	2	1	19	29

The perception of core skills demand indicate that a range of core skills were demanded related to emerging markets – the highest demand being for mobile phone repair, support and service for solar panel, repair of photocopiers, and repair of radio and TV. The skills demands also suggest a degree of volatility and the need for acquiring a range of skills that may be transferrable to new and emerging tasks in the electronics trades.

The following Figure also shows graphically the demand level of specific jobs which indicate job-specific competencies required in the industry and a shifting employment market for which workers have to be trained and prepared. (Figure 3)

Figure 3: Most demanded job titles in the electronics industry



Curriculum Analysis

Empirical Analysis of Existing Curriculum using Secondary data

The data for this part of the study were obtained from 2 secondary sources-

- Existing curriculum of trade courses of electronics sector from BTEB, BNFE, BMET, UCEP, Society for Underprivileged Families(SUF) and Community Participation and Development (CPD)
- Selected training providers and institutions in Dhaka city and information about their present training provisions. An extensive comparative analysis has been done on 6 major training providers' curriculum and training contents.

Vocational Setup of Training providers and Institutions in Bangladesh

Bangladesh Technical Education Board (BTEB) is the formal government accrediting body and national skill development, monitoring and controlling authority. BTEB- approved and affiliated courses like General Electronics, Mobile Phone Servicing and Radio-TV Servicing are the 3 Basic Trade courses of 360 hours (within 6 months) run within a structured frame of curriculum. Fourteen such institutions have been identified in Dhaka City corporation area. However, it was found that most of these training centers had no trainee at all; only 3 had a few trainees only in mobile phone servicing trade. (Source: BTEB trade course final exam schedule, December, 2012).

BNFE offers some skills training for children with limited formal education, as noted earlier. The electronics related trade course of BNFE are of different duration from 6 months to 9 months, offered in partnership with selected NGOs.

The other major training providers in the electronics trades, noted earlier, are UCEP, training centers in Dhaka city supported by SUF and CPD, Dhaka Ahsania Mission, Muslim Aid Institute and a few others.

Major deficits/Gaps of different curricula

Table 3 shows the extensive comparative analysis of the existing curriculum of electronics trade courses in Bangladesh.

Table 3: A comparative Analysis of Curricular Contents for Electronics Trade Courses in respect of core skills

SL No	Electronics Job-related core/ skills/skills offered in courses	UCEP		SUF	CPD	BTEB		BNFE TVS+MPS+PPS	BMET
		ENT	EEC			GE	MPS		
1	Mobile Phone Repairing	×	NS	×	NS	NS	√	√	×
2	Solar Panel Installation and Maintenance	√	√	×	√	×	×	×	×
3	Printer Servicing	×	×	×	×	NS	×	√	×
4	TV Repairing	√	×	√	√	√	×	√	√
5	Stabilizer, UPS, IPS Repairing	×	×	√	√	NS	×	×	×
6	Photocopier, Fax Operation & Repairing	×	×	×	×	NS	×	√	×
7	Stabilizer, UPS, IPS Assembling	√	×	NS	√	NS	×	×	×
8	Consumer Electronics Appliances Repairing	√	√	√	×	NS	×	×	×
9	TV Assembling	×	×	√	√	×	×	×	×
10	Dish Antenna, Fiber Cable Installation and Operation	×	×	×	×	×	×	×	×
11	Electronic security system Operation	NS	×	×	×	×	×	×	×
12	Multimedia Device and Sound System Servicing	×	×	NS	×	NS	×	×	NS

SL No	Electronics Job-related core/ skills/skills offered in courses	UCEP		SUF	CPD	BTEB		BNFE TVS+MPS+PPS	BMET
		ENT	EEC			GE	MPS		
13	Industrial Control System (PLC) Operation	×	√	NS	×	×	×	×	×
14	Electronic/Microcontroller Based System Operation	×	×	×	×	×	×	×	×
15	PCB Making	√	√	√	√	√	√	×	NS
16	PCB Design	√	×	×	×	×	×	×	×
17	Medical Equipment Operation	×	×	×	×	NS	×	×	×
		6+1 NS	3+1 NS	4+3 NS	5 NS	1+8 NS	1 NS	4 NS	1+2 NS

Legend: √- Competency available, ×- Competency Not Available, NS-Not sufficient, TVS-Television Servicing, ENT-Electronics, EEC-Electrical and Electronic Control, GE-General Electronics, MPS-Mobile Phone Servicing, PPS-Photo copier Servicing.

For comparing the curriculum of BTEB, BNFE, BMET, UCEP, SUF and CPD, the main components and features are listed in the second column. The cells are filled for different training providers to indicate if the components or features are addressed by them.

It can be seen that in the courses offered, the curriculum format, course contents and clustering of competencies do not quite meet the demand of the industries. The existing trades courses are not designed according to the changing demands of the employers. The clustering of the competencies/job skills of different trades are not appropriate and in some case not properly inter-connected. The core, common and basic skills in terms of knowledge, competencies and attitude are not reflected well in the curriculum. Comparatively speaking, BTEB and UCEP curriculum are more structured and resourceful than the others.

A review of the curricular materials for BMET, BNFE, SUF and CPD indicated deficiencies of various types. The curriculum is presented as a list of contents (a syllabus) instead of indicating the rationale, structure and objectives and learning outcomes of the curriculum. Similarly, the entry qualifications and target groups, educational qualification and skill level of instructors/teachers, numbers of teachers/instructors required, target job market / employment area, and clear listing of basic, common and core competencies are lacking. Listing of required and up-to-date tools, equipment and raw materials, criteria for functional workshop/lab, number of required instructor and workshop personnel/staff, trainees per group, inclusion of industrial attachment, assessment criteria and condition, method of assessment are not spelled out. The use of proper action verbs to indicate competencies and competency elements, training methodologies, medium/language of instructions and prescribed/recommended references of books/ modules/website mostly not mentioned adequately or at all.

BTEB and UCEP curriculum for electronics trades are better designed, but they follow different formats for presenting the curriculum. The UCEP curriculum is of modular type;

specific objectives (both theory and practice) under a learning unit are written together in modules, where theoretical approach are emphasized and use of action verbs helps to explain cognitive, psychomotor and affective domains of knowledge, skills and attitudes to be acquired, following Bloom's taxonomy of learning outcomes.(Anderson, et al., 2001)

The most demanded core jobs-related competencies derived from the responses of employers and the analysis of components and features of electronics sub-sector jobs have been taken into account in the second column of the following matrix to interpret and check the availability and sufficiency of core competencies in different trade courses so that the gap in the curriculum could be determined and remedial measures could be considered.

It is evident from the matrix in Table 3 that many of the industry demanded job-related competencies are not included in the trade curriculum of electronics courses and some of the competencies are not sufficient for or relevant to the current demand of the industries.

The common competencies for electronics sector jobs determined by a workshop under TVET reform project with the guidance of BTEB are indicated in the following matrix in Table 4 (BTEB, 2009).

Table 4: Comparative analysis of the curriculum of different training providers in respect of Common Competencies

SL No	Job/Common Competencies	UCEP		SUF	CPD	BTEB		BNFE TVS+MPS+PPS	BMET
		ENT	EEC			GE	MPS		
1	Using Electrical & Electronics Tools & Equipment	√	√	√	NS	√	√	√	√
2	Using Measuring Instrument	√	√	√	NS	√	√	√	NS
3	Simple Electrical Wiring	√	√	×	×	×	×	×	×
4	Soldering	√	√	√	×	√	√	NS	√
5	Measuring & Calculating Electric and Electronic quantities and units.	√	√	√	NS	√	√	×	√
6	Using Common Electrical & Electronic Devices	√	√	√	√	√	√	NS	√
	Total	6	6	5	1+3 NS	5	5	2+2 NS	4+1 NS

Legend: √- skill offered, × – skill not offered; NS – Not sufficient. TVS-Television Servicing, ENT-Electronics, EEC-Electrical and Electronic Control, GE-General Electronics, MPS-Mobile Phone Servicing, PPS-Photocopier Servicing.

In the case of common competencies it was found that the curriculum of UCEP and BTEB cover most of the competencies, whereas the other providers did not address sufficiently the common relevant competencies.

Table 5: Comparative Analysis of the curriculum of different training providers in respect of Basic/Generic Competencies

SL No	Job/Basic Competencies	UCEP		SUF	CPD	BTEB		BNFE	BMET
		ENT	EEC			GE	MPS	TVS+MPS+PPS	
1	Simple Arithmetic Calculation	×	×	√	×	√	×	×	×
2	Maintain Occupational Health & Safety	√	√	√	√	√	√	NS	√
3	Interpersonal and Communication skill (Life Skill)	√	√	×	×	×	×	×	×
4	English Language	√	√	√	√	√	×	NS	×
	Total Provision for Competency	3	3	4	3	4	1	2 NS	0

Legend: × – competency not included; √ - competency included; NS – content not sufficient. TVS-Television Servicing, ENT-Electronics, EEC-Electrical and Electronic Control, GE-General Electronics, MPS-Mobile Phone Servicing, PPS-Photocopier Servicing.

Considering the basic competencies , it can be seen that of the 8 types of courses offered, three fall short in addressing basic competencies These include BTEB’s mobile phone repair and servicing, BNFE’s electronics courses, and BKKTC courses under BMET. There may be an assumption that the trainees should have already acquired these basic skills before they join the trade course, which of course is not the reality. Lack of these basic skills hampers skills development of these trainees which affect adversely their preparation for job and performance in job, if they manage to get employed.

Table 6: Comparative analysis of competencies offered in different electronics trade courses at a glance

Training Provider Name	Trade Name	Number of Core Comp		Number of Common Comp		Number of Basic Comp		Total Comp		Net Comp
		Su	NS	Su	NS	Su	NS	Su	NS	Su+ NS
BTEB	General Electronics	1	8	5		4		10	8	18
	Mobile Phone Servicing	1		5		1		6		6
UCEP	Electronic Technology	6	1	6		3		13	1	14
	Industrial Electrical and Electronic Control	3	1	6		3		12	1	13
BMET	General Electronics	1	2	4	1	0		5	3	8
BNFE	Computer and Mobile Phone Servicing	4		2	2	0	2	6	4	10
	Radio –TV servicing									
	Photocopier and Printer Servicing									
SUF	Electronics Tech.	4	3	5		4		13	3	16
CPD	Electronics Tech	5		1	3	3		9	3	12

Legend: Su – Sufficient; NS- Not Sufficient; Comp - Competencies

From the above comparative analysis at a glance (Table 6) of different curricula, it is clear that none of the above TVET providers address fully and effectively the industry requirements, especially in respect of the core competencies.

Reform Proposal

Considering the overall findings, and based on views expressed by employers at FGD, a set of reforms in the electronics trade courses are proposed which is summarized in the following table (Table 7).

Table 7: Outline of reforms in electronics trade courses curriculum

Demand Priority	Existing Trades Course Name	Most Demanded Trades course Name	Reform perspective	Course Duration and Level in NSS	Level in NTVQF under CBT
1	Mobile Phone Servicing	Mobile Phone and Consumer Electronic Servicing	Reform required in existing course including to add a core competency -- Support Consumer Electronics	360 hours (3 to 6 month) Basic Trade	Level-1
2	---	Solar System Installation and servicing	New demanded course	360 hours (3 to 6 months) Basic Trade	Level-1
3	---	Printing Machine Servicing	New demanded course	360 hours (3 to 6 months) Basic Trade	Level-1
4	Radio-TV Servicing	TV and Multimedia Servicing	Reform required in existing course including to add a core competency -- Support Multimedia Devices and Software	360 hours(3 to 6 months) Basic Trade	Level-1
5	General Electronics	General Electronics & Control System Servicing	Reform required in existing course including to add 3 core competencies 1) Design and Make PCB 2) Support PLC system 3) Support Microcontroller System	360 hours (3 to 6 months) NSS-3 Pre requisite -- Basic Trade in Electronics subsector	Level-2 and Level-3

Note: NSS – National Skill Standard; NTVQF – National Technical Vocational Qualification Framework; CBT- Competency- Based Training

The reform outline takes in to account the need for a range of core and common competencies for trainees, the volatility of the employment market, and the capacity of the workers in electronics trade to take advantage of emerging job market opportunities.

VI. Recommendations

For implementing an up- to- date industry demanded standard and effective training for the electronics sector, a set of recommendations are offered.

- 1) A curriculum development team should be formed by BTEB involving various training providers, led by a curriculum specialist in the relevant trade area for developing the curriculum for meeting market demand and responding to changing and emerging skills needs in the electronics trades.
- 2) Trade courses and the clusters of competencies for the courses should be examined and restructured considering the changing technologies and current as well as emerging needs of the local industries and abroad.
- 3) The traditional training approach should be transformed to adopt the Competency Based Training approach so that quality in training and industry standard for the workforce can be ensured.
- 4) Curriculum should be developed with the involvement of the Industry with active participation of the industry employers and keeping in view the changing technologies and market needs..

VII. Concluding Words

The adequacy of the supply of skilled workers has become an issue of increasing importance to electronics firms. A general slowing down in the pipeline of workers' supply both in terms of numbers and their skills has become an obstacle to the development of the sub-sector. The increasingly high-tech nature of manufacturing, assembling, repairing and servicing in the electronics industries is making it increasingly difficult to find adequate numbers of skilled workers. Pro-active policy measures for addressing this situation are essential.

The empirical findings of this study have revealed that there are huge shortcomings in the current trade courses in the electronics subsector and their outputs. There are some non-accredited training organizations and industry-based skills development which may contribute to development in providing modern and need based training. The potential of informal apprentice training also must be given attention. A survey may be conducted for listing and finding their strength and weakness so that an integrated approach could be applied in developing the quality of training in Bangladesh. Industry standard council (ISC) in this subsector, BTEB, BNFE, UCEP, MAWTS, and others can join in this initiative. BTEB can lead this journey.

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