MASTER OF SCIENCE IN TECHNICAL EDUCATION
(ELECTRICAL AND ELEETRONIC ENGINEERING)

A COMPARATIVE STUDY ON S.S.C (VOC.) AND DAKHIL (VOC.) STUDENTS' PERFORMANCE IN BANGLADESH

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RECOMMENDATION OF THE BOARD OF EXAMINERS

08 November 2017

We hereby recommend that the thesis prepared by **Abdullah Al Mamun (Student No. 153603)** entitled **"A comparative study on S.S.C (Voc.) and Dakhil (Voc.) students' performance in Bangladesh"** has been found as satisfactory and accepted as partial fulfillment of the requirement for the award of Master of Science in Technical Education (M.Sc.TE) with specialization in Electrical and Electronic Engineering on October 2017.

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This project work is authentic, and it is an outcome of the investigation carried out by **Abdullah Al Mamun** under the supervision of **Dr. Md. Aktaruzzaman,** in the Department of Technical and Vocational Education (TVE), Islamic University of Technology (IUT), Organization of Islamic Cooperation (OIC), Gazipur, Bangladesh. It is hereby declared that this thesis/report or any part of it has never been submitted elsewhere for the award of any Degree or Diploma. All literatures and contributions cited are fully acknowledged.

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DEDICATED

I dedicate my thesis work to my parents who brought me into this nice world and spouse for her encouragement, wisdom and uncountable assistance in one way or the other, which enabled me to stay strongly and sharply focused throughout the entire masters' program.

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ACRONYMS

ADB	**Asian Development Bank**
BANBEIS	**Bangladesh Bureau of Educational Information and Statistics**
BTEB	**Bangladesh Technical Education Board**
BMET	**Bureau of Manpower, Employment and Training**
GPA	**Grade Point Average**
DTE	**Directorate of Technical Education**
GPA	**Grade Point Average**
ILO	**International Labor Organization**
IUT	**Islamic University of Technology**
M.Sc.TE	**Master of Science in Technical Education**
MPO	**Monthly Payment Order**
NGO	**Non-Government Organization**
NSDC	**National Skills Development Council**
NSDP	**National Skills Development Policy**
NSC	**National Skill Certificate**
NSS	**National Skills Standard**
OIC	**Organization of Islamic Cooperation**
PC	**Practical Continuous**
PF	**Practical Final**
PhD	**Doctor of Philosophy**
SPSS	**Statistical Package for Social Science**
S.S.C	**Secondary School Certificate**
TC	**Theoretical Continuous**
TSC	**Technical School and College**
TTC	**Technical Training Center**
VET	**Vocational Education and Training**
TVE	**Technical and Vocational Education**
TVET	**Technical and Vocational Education and Training**
Voc.	**Vocational**

ABSTRACT

The social, economic and cultural development of any country largely depends upon education, especially technical and vocational education. Governments have taken different various steps to improve quality and to increase the quantity of Technical and Vocational Education and Training (TVET) graduates in Bangladesh. Vocational Training course at the secondary level school follows a compulsory formal curriculum combining general skills with occupation-specific education. The success of the school-based training crucially depends on the alignment of skills taught in the schools and application of the skills to the labor market both local and global, and hence requires close collaboration of employers, unions, educational institutions and all other relevant stakeholders. The objectives of this study were to compare student academic performance, identify the problems and prospects of integrated curriculum and other issues at the secondary level S.S.C (Voc.) and Dakhil (Voc.) of High School and Madrasah education respectively in Bangladesh.

The null hypotheses were tested by analyzing the data relating to the academic achievement of the selected two groups. Independent sample t-test was applied to determine the significance difference between SSC (Voc.) and Dakhil (Voc.) students as well as to the male and female students. From the analysis it was observed that mean score of SSC (Voc.) students was higher than Dakhil (Voc.) and females had higher mean score than male in both cases. However, there was significance difference between male and female in SSC (Voc.) High Schools, where female students had higher achievement than the male students. Dakhil (Voc.) Madrasah cases same results were found between male and female with respect to their academic achievement. In the statement-wise category percentage, weighted average and Mann-Whitney-Wilcoxon tests, it was found that majority of students were not facing difficulties to understand the subject matter except English and competent level of trade subject. They also faced problem with labs, equipment's and raw materials during their study. The findings of the study may provide useful information to the authorities of TVET as well as to the secondary level executive committee, administrator, teachers of SSC (Voc.) in High Schools and Dakhil (Voc.) in Madrasahs in order to improve student performance and teachers' technical skills. The study may also help to identify the problems and throw some light on how to overcome the problems related to implementing integrated curriculum and other related institutional facilities.

CHAPTER I

INTRODUCTOIN

1.1 Introduction and Background of the Study

The social, economic and cultural development of any country largely depends upon education, especially technical and vocational education. Bangladesh is progressing from least developing country to mid-level economic country. It has taken different steps to improve quality and to increase the quantity of Technical and Vocational Education and Training (TVET) graduates in Bangladesh. According to Aktaruzzaman and Clement (2010), school-based Vocational Education and Training (VET) is delivered at training centers at the secondary level compulsory school following a formal curriculum combining general skills with occupation-specific education. Though the provision of technical skills aims at direct entry into the labor market, it requires only little on-the-job training by employers, and hence might be perceived as creating incentives for employment. The success of the school-based training crucially depends on the alignment of skills taught in the schools and application of the skills to the labor market both local and global, and hence requires close collaboration of employers, unions, educational institutions and all other relevant stakeholders.

According to BTEB Website (2017), there are 31 trades are in operation at SSC (vocational) in High school, Technical School and College (TSC), Technical Training Center (TTC) and Dakhil (Voc.) in Madrasah. This is the first level of vocational education in Bangladesh under the Bangladesh Technical Education Board (BTEB). Students who pass Grade-8 under certain categories of education system in Bangladesh, are allowed to get admission in S.S.C (vocational) program. BTEB introduced S.S.C (Voc.) and Dakhil (Voc.) in 1995 in order to meet the demand of local job market and overseas employment opportunities. These certificate level programs are designed through integrating general education subjects with vocational trade subjects in order to (i) ensure high level of effectiveness of vocational graduates in education, industry, self-employment sectors; (ii) transform educated graduates into skilled manpower as per need of the domestic and overseas job market; and (iii) ensure social value and equal job opportunities for the vocational graduates in Bangladesh.

A number of studies recognized students' personal characteristics as one the factors affecting academic performance. These include sex, age, ability, parenthood, housing expenditures, social background, time spent on studies, time spent on paid work and motivation (Bugge & Wıkan, 2012).

Gender is an important issue in explaining academic performance of students. Likewise Islam (2014) confirmed gender of the students depicted significant independent effect on CGPA. Institutional academic factors that have been identified to affect performance include physical facilities, institutional policy on class attendance, library facilities, enrollment percentages, availability and qualification of institutional academic staff, teaching methods and evaluation system (Ali, 2013). The institutional variables such as unfavorable learning conditions, interrupted water supply, poorly equipped library, overcrowded exam time table, incessant strike and closure of school among other variables.

1.2 Statement of the Problem

In order to fill above stated gap, this study aimed at identify the students' academic performance at secondary level SSC (Voc.) in High Schools and Dakhil (Voc.) in Madrasahs and also compared the male-female academic performance of the respective institute. Identifying various constraints in this study encountered by students and teachers in implementing the respective vocational curriculum and institutional facilities had also significant impact on the students' academic performance.

1.3 Objectives of the Study

1.3.1 General objective: The main objective of this study was to compare student academic performance between S.S.C (Voc.) and Dakhil (Voc.) of High School and Madrasah education respectively in Bangladesh.

1.3.2 Specific objectives: The specific objectives of this study were to:
1. investigate any difference in academic performance of male students between High School and Madrasah education;

2. investigate any difference in academic performance of female students between High Schools and Madrasahs;

c) find out any significant difference in academic performance between male and female students in S.S.C (Voc.) of High Schools;

d) find out any significant difference in academic performance between male and female students in Dakhil (Voc.) of Madrasahs.

e) identify the impact of integrated curriculum and environmental factors at the secondary level High Schools and Madrasahs experienced by SSC (Voc.) and Dakhil (Voc.) students.

1.4 Significance of the Study

Bangladesh is a developing country and its economy basically depends on the garments industry and agriculture. There are large number of public and private vocational institutions such as TSC, TTC, School (Voc.), Madrasah (Voc.) scattered all over the country. The S.S.C (Voc.) and Dakhil (Voc.) Program of BTEB is implemented through High School and Dakhil Madrasah institutions, where both male and female students get technical and vocational education, which is referred to as co-education system (both male and female students learn in a same class).

There is a need to conduct a comprehensive study to compare the performance SSC (Voc.) and Dakhil (Voc.) students as well as male and female students. It is also needed to identify what type problems faced by the students in integrated curriculum and regarding environmental factors in the institute. Researcher hopes that finding of this study may provide useful information to the authorities of Technical and Vocational Vducation (TVE) as well as to the secondary level teachers of TVE in order to improve student performance and teachers' technical skills. The study may also help to identify the problems and throw some light on how to overcome the problems concerning existing teaching learning process in TVE sector. From these findings policy maker, planner, administrator, and researcher can get valuable information about the certificate level vocational education in Bangladesh.

1.5 Research Hypothesis

The study was carried out with the hypotheses as given bellow:

  i)   Is there any significant difference in academic performance of male students between High Schools and Madrasahs?

  ii) Is there any significant difference in academic performance of female students between High Schools and Madrasahs?

  iii) Is there any significant difference in academic performance between male and female students in Dakhil (Voc.) of Madrasahs?

  iv) Is there any significant difference in academic performance between male and female students of both High Schools?

  v)   What are the difficulties of integrated curriculum and environmental factors faced by the students at the secondary level High School and Madrasahs?

1.6 Assumptions

The researcher assumed that, there are so many constraints to the students of SSC (Voc.) in High schools and Dakhil (Voc.) in Madrasahs for performing better results in public examination in Bangladesh. BTEB has implemented curriculum and other institutional environment in order to minimize difficulties faced by the students and thereby, producing better academic performance. The researcher also assumed that the problems vary from institution to institution on the facilities and resources available to them. The researcher further assumed that respondents were aware of the constraints and they could be provided sufficient information.

1.7 Delimitation

The research was delimited to students and teachers from five High Schools and seven Madrasahs having vocational courses alongside general education located in Dhaka, Mymensingh, Rangpur, Barisal and Chittagong division only. The study was conducted in MPO High Schools and Madrasahs, which may not be generalized to other public institute populations. The study covered only rural area as Dakhil (Voc.) institute was not found in urban area.

The study used grade point averages as a measure of academic achievement. The use of other measures such as standardized testing may yield different outcomes. Another issue was evidenced during the study that SSC (Voc.) and Dakhil (Voc.) institutes were not bearing equal facilities for the participating students.

1.8 Definition of the Terms and Concepts

Madrasah: Arabic for "school", English madrassa, Turkish medrese, and in Muslim countries, any type of educational institution where secular or religious subject are taught. In the West, it usually refers to a specific type of religious school or college for the study of Islamic religion (with a curriculum centered on the Quran and Hadith), though this may not be the only subject studied. In countries like India it can be a secular, vocational, religious or technical school and also includes a modern curriculum.

Vocational Education: Vocational education is a type of education that encompasses both the teaching and learning of knowledge, proper conduct, and technical competency. It is education and training which aims to equip people with knowledge, know-how, skills and/or competences for a specific vocation in industry or agriculture or trade. Okorie (2001) defined vocational education as any kind of education with the main purpose being to prepare one for employment in recognized occupations. The author believed that any education that is essential for effective employment in an occupation is vocational education. Therefore, any education that will provide skills knowledge and attitudes necessary for effective employment in specific occupation is vocational education. Nwachukwu (2003) also share the same view with the Okorie by defining vocational education as educaton for work. Nwachukwu also believed that the education that prepares individuals to be gainfully employed is vocational education. These two scholars have explained vocational education separately from technical one as education that prepares someone to be gainfully employed to a work.

Curriculum: A plan incorporating a structured series of intended learning outcomes sequenced and organized as a related series of units, modules or subjects and associated learning experiences. A curriculum usually contains a statement of aims and specific

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objectives. It indicates some selection and organization of content; it either implies or manifests certain patterns of learning and teaching…finally it includes a program of evaluation of the outcomes. (Taba, 1962, p. 10). D'Hainaut (1981) defined curriculum as a training design or plan that defines aims, goals and objectives of an educational activity.

Performance: Performance means the academic achievement of the students in terms of Grade Point Average (GPA) and justifies confidence level of math, science, English and it may also include competency of trade subject.

Trade: Every technical subject for SSC (Vocational) and Dakhil (Vocational) curriculum is known as a 'Trade'. The trade subjects are emphasized on practical job or skill for a particular specialization.

Qualified technical teacher: A teacher who has acquired teaching skills (methods and techniques of teaching) and sufficient knowledge and skills of his subject curriculum and content, particularly the technical aspects.

CHAPTER- II

LITERATURE REVIEW

2.1 Introduction

Bangladesh is one of the developing countries in the world. Its per capita income is not like developed or mid-level developed countries. It covers an area 147570 square kilometer and the population is 160 million. Average life span at birth is 67.57 years; Gross National Income (GNI) comes from Agriculture -48.4%, industries – 24.3%, and other services-27.3% (Source-Bangladesh Bureau of Statistics-BBS). Countries GDP per capita (US $) - 1,538, GDP rate of growth (%) - 7.24, which are important factors for the any national development (National Accounts books_2017 p-7,BBS).

According to ILO report on "World Employment and Social Outlook" (2017), working poverty is still remained a problem in 2016, with nearly half of workers in Southern Asia and nearly two-thirds of workers in sub-Saharan Africa living in extremely working poverty (i.e. living on less than US$3.10 per day in purchasing power terms). Working poverty rates have been declining over the long term and this trend is expected to continue in 2017. In emerging and developing countries, the share of workers living in moderate or extreme poverty is expected to fall from 29.4 per cent in 2016 to 28.7 per cent in 2017. However, progress in reducing working poverty rates is going relatively slow. The absolute number of working poor has also been declining over recent years, but the rate of that reduction is now also slow, and in developing countries the number is on the rise. While both the rates and numbers of working poor have been falling rapidly in emerging countries, progress in developing countries has been too slow to keep up with employment growth.

Education has a tremendous impact on all segments of society. In the modern age of society and technology, the foundation of development cannot build by general education only. So the technical education (all branches of technical, vocational and engineering education) is considered as a vital aspect of education system. Therefore, vocational education has a much broad application in a society that prepares for a job in domestic and overseas market. Since the main barrier of all sorts of development like human resources, social, economic,

industrial etc. are illiteracy and less enrollment of technical and vocational education. Government of Bangladesh is trying to increase the literacy rate as well as expansion of technical vocational education and training to produce skilled manpower. According to Frykholm & Nitzler (1993), vocational education is characterized more by effective behavior than by qualification. It is more emphasis on transmitting an inclination and attitudes than of giving the knowledge required for specific tasks.

In TVET, issues range from insufficient teachers and trainers, weak quality assurance mechanisms, low employment rate of graduates, lack of information about demand (leading to a mismatch between training and available jobs), expensive and long-term training that excludes the poor and marginalized group of the society, weak institutional arrangements, and inadequate provision of high-quality training programs (Asian Development Bank [ADB], 2015).

2.2 Necessity of Vocational Education.

The term vocational, the move is from education-driven to a functional model of skills development within secondary schooling as an inclusion of vocational (trade subject) content into schooling to a broader interpretation than the general education stream at school. (Pavlova & Maclean, 2013). George (2012) observed that it can be delivered at different levels of sophistication meaning that TVET can respond, not only to the needs of different types of industries, but also to the different training needs of learners from different socio-economic and academic backgrounds and prepare them for gainful employment and sustainable livelihood. The 1997 UNESCO international standard classification of education defined TVET as education and training to acquire the practical skills, know-how and understanding necessary for employment in a particular occupation, trade or group of occupations. TVET therefore is not only about knowing how to do things but also understanding why things are done. The International labor organization (ILO) is committed to make sure that change a political constitution would provide evidence-based advices on policies that are effective in improving employment and a social consequence. (Stated the agenda for research agreed by the Governing Body of ILO in November 2014)

Bangladesh has identified that TVET will be one of the major areas for developing quality human resource to increase the effectiveness of productive effort. The main priority areas are a formal assessment with instituting change in the institution and strengthening TVET policies, systems and collectively considered at the central and decentralized levels, strengthening the capacity of key institutions (DTE, BTEB, BMET) which play important role in the management and quality assurance of TVET sector (UNESCO office in Dhaka). Vocational education also plays vital roles in reducing unemployment, through creating employment in the fields of pre –vocational specialization. It can improve productivity and consequent resulting in higher graduate earnings. It can establish a close relationship between vocational school graduates and the world of work. Vocational education will promote equity by bridging gap between urban and rural in education that serves the needs of relatively poor people.

2.3 An Empirical Works or Decision

The main aims of the expansion of vocational education during this century were to meet the demands for a technically proficient labor force, integrating children from the lower socio-economic background and transform them to a loyal and disciplined workforce.

After the mid-twentieth century, independent nations started expanding post-primary education and many vocational training programs were introduced at the secondary level (Benavot, 1983). During the post-World War II period, many international agencies, such as the International Labor Organization (ILO) and UNESCO, played major roles in the development of vocational education. It has been opined that after the Second Industrial Revolution at least three 'ideal models' of the vocational system emerged. One is a market-led system in which a labor market characterized by substantial mobility provides much of the vocational training. Another is a school model, where most of the VET takes place in schools. And third is a dual model with the presence of an apprenticeship system (Nilsson, 2010). These models continue to distinguish today's national systems.

In recent years, creation of a skilled labor force has been a challenge in many countries, where there is a growing demand for a skilled labor force which has remained unfulfilled. To

meet the requirement for a skilled labor force, more emphasis has been given to the VET programs. This issue has been at the center of the policy agenda of many national governments, particularly in the South Asian countries. Governments in these countries have initiated various steps towards building a sound VET system (Agrawal, 2013). According to Persey (2016), trade is a means to support the implementation of the 2030 Agenda for Sustainable Development and the Addis Ababa Action Agenda. With appropriate supporting policies, adequate infrastructure and an educated and trained workforce, it can also help to promote productive employment, youth and women's empowerment, food security and reduced inequality. A large body of empirical literature has developed over the past 25 years which argues strongly, on cost-benefit grounds, against vocational schooling at the secondary level.

TVET is generally more expensive than general education due to factors such as smaller classes, the cost of equipments and supplies. As specialized secondary schools and vocational schools cost $660 and $350 per student, respectively, whereas $240 per student in ordinary secondary schools (Copenhagen Development Consult A/S 2005: 41). In Indonesia, vocational secondary schools cost 25% more per student than general secondary schools (ADB 2009b). Despite these higher costs, in some countries, TVET graduates do not receive higher wages than general education graduates. The results of a World Bank tracer study in Bangladesh indicated that overall, only 10% of TVET graduates were employed, whilst in the case of female graduates, this was just 5%. About 45% of graduates were unemployed and 45% were pursuing further education (World Bank 2007: p. 29). In addition, those with vocational qualifications who were employed received lower wages than did graduates of the general education system (World Bank 2007: p. 33), suggesting low returns on investment in TVET that is supply-driven.

2.4 TVET Scenario in Bangladesh

BANBEIS stated the Gross Enrollment Rate and Net Enrollment Rate of secondary level education are 69.23% and 62.25% respectively. (Bangladesh Educational Statistics-2014). The Directorate of Technical Education under the Ministry of Education is trying to increase the enrollment rate of technical education and recent academic year 2017-18 enrollment is

17.45%. Similarly, it has also been found in the table 4.5 namely course, total student percentages and male- female percentages shown.

Table 2.1: The table statistics and percentage gathered from Directorate Technical Education (DTE) website.

Courses	Male student	Female student	% of female	Total Student
SSC (Vocational)	207279	97543	32%	304822
Dakhil (Vocational)	28600	8000	21.85%	36600
HSC (Business Management)	182000	78000	30%	260000
HSC (Vocational)	17526	3093	15%	20619
Diploma in Engineering	315770	31230	9%	347000
Basic Trade (360 Hr.)	170411	80193	32%	250604
Total	170411	298029	24.45	12,19,645

Female enrollment is vital issue for the technical education especially for the vocational education comparatively they are very poor than the male student. The scenario of female student's access in the technical education is shown in the figure below:
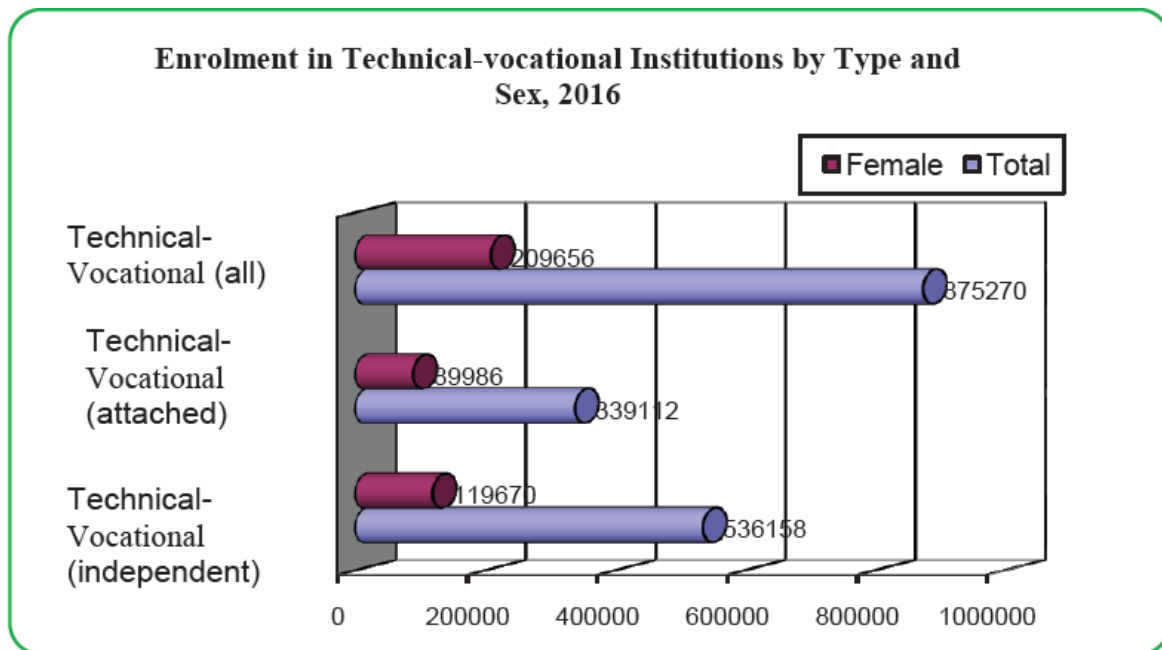
Figure-2.1: Adopted from A Report of BANBEIS "Bangladesh Educational statistics-2016"

Moreover, the National Skills Development Policy (NSDP)-2011 represents a key commitment to strengthening and further growth of skills development in Bangladesh aligning with the targets of National Strategy for Accelerated Poverty Reduction II (NSAPR-II). It is mentioned in the article 22 "Future Growth of the Sector" of NSDP-2011 (p.37) that:

a. Total proportion of TVET participants need to comprise 20% of the students enrolled in the secondary stage by 2020.;

b. Total enrolment in TVET should increase by 50%;

c. Women's enrolment should increase by 60%.

At present, Bangladesh needs skill human resources to support rapid industrial growth and earnings remittance. TVET is the only source in Bangladesh by which economic developments can be strengthened, therefore, need to make a manpower having global competitiveness. We need to introduce courses to match industry need and opportunities of demographic dividend to be harnessed. In this regard strategic planning is required to develop TVET system. A large number of people of Secondary and Higher Secondary Schooling group are out of School. Technical and Vocational Education and Training (TVET) is the one and only educational mechanism to convert these population to employable workforce in order to contribute to the national economy of our country. The major targets of expanding TVET in Bangladesh as follows-

• Skilled workers to satisfy the growing needs of industry;
• A high level means to facilitate job for unemployed youth and widespread underemployment;
• Competencies need to find employment;
• Match the requirements of the private sector;
• Skills for the job market in line with labor market demands;
• Understand the attitudes expected in the industry area;
• Gain insights into the kind of career;
• Make informed decisions about further training and study;
• Become more employable;
• To be better equipped for business and employment opportunities;

• Aims to improve socio-economic conditions create jobs and alleviate poverty as a key
  element of any policy initiatives

• Promote industrial linkages in the skill training delivery to produce young skilled workforce
  for the market needs;

There are mainly two types of TVET in our country, such as-

    A. Formal Training

    B. Informal and Non-Formal Training

Formal Training under BTEB

    1. Short Course

    a. Basic Trade Course (360 hours, 95 trades) - Institutes Namely:

    i. Govt. Technical School and Colleges;

    ii. Govt. Technical Training Centers;

    iii. Govt. Polytechnic Institutes;

    iv. Private Polytechnic Institutes;

    v. Private Training Institutes;

    b. CBT&A Course (51 Occupations) - Institutes Namely:

    i. Govt. Technical School and Colleges;

    ii. Govt. Technical Training Centers;

    iii. Govt. Polytechnic Institutes;

    iv. Private Polytechnic Institutes;

    v. Private Training Institutes;

    2. Secondary Level

    a. SSC Vocational Course (31 trades) - Institutes Namely:

    i. Govt. Technical School and Colleges;

    ii. Govt. Textile Vocational Institutes;

    iii. Govt. Technical Training Centres;

    iv. MPO secondary schools;

    v. Non MPO secondary schools;

    vi. NGOs;

    b. Dakhil (Vocational) offered by Madrasah

2.5 Vocational Education in Bangladesh

The educational programs, which are aimed to produce skilled workers and craftsmen, are known as vocational education, UNESCO definition of vocational education states as

- ❖ Vocational education for orientation as a part of general education;
- ❖ Vocational education for skill development through the formal and non-formal education;
- ❖ Vocational education as continuation education mostly for the employed skilled worker.

The vision for skills development shared by government, industry, workers and civil society is that: "Skills development in Bangladesh will be recognized and supported by government and industry as a coordinated and well-planned strategy for national and enterprise development. The reformed skills development system will empower all individuals to access decent employment and ensure Bangladesh's competitiveness in the global market through improved skills, knowledge and qualifications that are recognized for quality across the globe" (BTEB Website, 2017).

The aims and objectives of vocational and technical education are to:

- increase competent manpower in diverse sectors including Information and Communication Technology at a fast pace keeping in mind the national and international demands;
- build up skilled manpower at a fast pace to create opportunities of economic development and to increase dignity of labor;
- to create wide-ranging employment opportunities through export of skilled manpower and to enhance foreign currency earnings.

The Constitution of the Government of the People's Republic of Bangladesh states that: "The state is responsible for development of human resources of the country irrespective of gender, and to assist in employment as per the capabilities of every citizen." In the National Strategy for Accelerated Poverty Reduction II (NSAPR II), emphasis is given to the

enhancement of workers' skills for "Improvement of the percentage of vocational and technical graduates obtaining employment both in the domestic and international markets. This percentage is targeted to 20% by 2020".

Policies and strategies are to be undertaken to build up competent manpower in view of national and international demands. In this situation information regarding enrollment in TVET is crucial. Steps taken for enrollment analysis has attempted to map the sources of TVET related data and assess their availability and reliability. Results of the analysis will contribute to the development of a database on TVET for better planning and resource allocation decisions, introducing programs, assess progress in the TVET sector and future programming for TVET. This is the first time development works have been taken in the enrollment assessment to design and implement a system of TVET related data in Bangladesh. (Source: Enrollment analysis on TVET in BTEB, P-13)

2.6 SSC (Vocational) and Dakhil (Vocational) Program in Bangladesh.

The SSC (Voc.) and Dakhil (Voc.) program has been designed by integrating general and vocational program. Students enrolled in class IX with schooling groups covered 8(eight) grade from General Education Boards. Students of class X schooling groups covered of class IX (Vocational) examination from Bangladesh Technical Education Board; those will participate in SSC (Voc.) and Dakhil (Voc.).

Students enrolled for National Skill Standard Basic (360 hours) course considered for class IX schooling group. The SSC (Voc.) and Dakhil (Voc.) both the courses are of two (2) years long, 36 working week, 6 days in a week and additional 6 weeks for industrial attachment in a year.[Source. SSC (Voc.) and Dakhil (Voc.) probidhan – 2017 BTEB in Bangla version]

Course structure of SSC (Vocational)

Table 2.2: Subjects of IX, period per week and marks distribution are shown.

Sl. No.	Period & mark / Subject	Subject code	Period			Marks				Total
						Theory		Practical		
			T	P	Total	TC	TF	PC	PF	
1	Bangla-1		2	0	2	40	60	0	0	100
2	English-1		2	0	2	40	60	0	0	100
3	Mathmatics-1		2	0	2	40	60	0	0	100
4	Religious Education-1		2	0	2	40	60	0	0	100
5	Bangladesh & world -1		2	0	2	40	60	0	0	100
6	Physics-1		2		2	30	45	12	13	100
7	Chemestry-1		2	2	2	30	45	12	13	100
8	Computer application-1		0	2	2	00	00	25	25	50
9	Engineering Drawing		0	2	2	00	00	25	25	50
10	Physical education - 1		0	2	0	00	0	25	25	50
	Total of compulsory subject		14	8	22	260	390	99	101	850
11	Trade -1		3	9	11	40	60	50	50	200
12	Trade - 2		3	9	11	40	60	50	50	200
13	Industrial attachment 6 week		0	0	0	0	0	25	25	50
Optional subject any one from below			20	26	44	Total compulsory marks				1300
14	Higher math-1		2	2	4	30	45	12	13	100
	Agricultutre-1		2	2		30	45	12	13	
	House hold science-1		2	2		40	60	0	0	
	Total Periods				48	Total marks				1400

After successful completion of Board final examination of class IX certificate are awarded on basis marks obtained both continuous assessment and in board final examination.

Table 2.3: Subjects of X, period per week and marks distribution are shown.

Sl. No.	Period & mark / Subject	Subject code	Period			Marks				Total
						Theory		Practical		
			T	P	Total	TC	TF	PC	PF	
1	Bangla-2		2	0	2	40	60	0	0	100
2	English-2		2	0	2	40	60	0	0	100
3	Mathmatics-2		2	0	2	40	60	0	0	100
4	Religious Education-2		2	0	2	40	60	0	0	100
5	Bangladesh & World-2		2	0	2	40	60	0	0	100
6	Physics-2		2		4	30	45	12	13	100
7	Chemestry-2		2	2	4	30	45	12	13	100

8	Computer application-2		0	2	2	00	00	25	25	50
9	Self-employment		2	0	2	20	30	0	0	50
10	Physical education-2		0	2	2	0	0	30	20	50
			16	6	22					
11	Trade -1 (1st paper)		3	9	11	40	60	50	50	200
12	Trade – 2 (2nd paper)		3	9	11	40	60	50	50	200
13	Industrial attachment (6 week)		0	0	0	0	0	25	25	50
Optional subject any one from below			22	18	44					
14	Higher math-2		2	2		30	45	12	13	100
	Agricultutre-2		2	2	4	30	45	12	13	
	Home economics - 2		2	2		40	60	0	0	
					48	Total marks				1400

[SSC (Voc.) Syllabus– 2013, BTEB in Bangla version]

Course structure of Dakhil (Vocational)

Table 2.4: Subjects of IX, period per week and marks distribution are shown.

Sl No.	Period & mark / Subject	Subject code	Period			Marks				Total
						Theory		Practical		
			T	P	Total	TC	TF	PC	PF	
1	Bangla-1		2	0	2	40	60	0	0	100
2	English-1		2	0	2	40	60	0	0	100
3	Arabic - 1		2	0	2	40	60	0	0	100
4	Quran Majid & Tasbid -1		2	0	2	40	60	0	0	100
5	Hadith & Fiqua - 1		2	0	2	40	60	0	0	100
6	Mathmatics-1		2	0	4	40	60	0	0	100
7	Physics-1		1		4	20	30	12	13	75
8	Chemestry-1		1	2	2	20	30	12	13	75
9	Computer application-1		0	2	2	0	0	25	25	50
10	Engineering Drawing		0	2	2	0	0	25	25	50
Total of compulsory subject			14	8	22	280	420	150		850
11	Trade -1		3	9	11	40	60	50	50	200
12	Trade - 2		3	9	11	40	60	50	50	200
13	Industrial attachment (6 week)		0	0	0	0	0	25	25	50
Optional subject any one from below			20	26	46	360	540	300		1300
14	Higher math-1		2/0	0/2		30	45	12	13	
	Agricultutre-1		2/0	0/2		30	45	12	13	
	Bangladesh & world-1		2	0	2	40	60	0	0	100
	Islamic Histiry-1		2	0		40	60			
			Total period		48	Total marks				1400

[Dakhil (Voc.) Syllabus – 2013, BTEB in Bangla version]

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Table 2.5: Subjects of X, period per week and marks distribution are shown.

Sl. No.	Period & mark / Subject	Subject code	Period			Marks				Total
						Theory		Practical		
			T	P	Total	TC	TF	PC	PF	
1	Bangla-2		2	0	2	40	60	0	0	100
2	English-2		2	0	2	40	60	0	0	100
3	Arabic - 2		2	0	2	40	60	0	0	100
4	Quran Majid & Tasbid -2		2	0	2	40	60	0	0	100
5	Hadith & Fiqua - 2		2	0	2	40	60	0	0	100
6	Mathmatics-2		2	0	4	40	60	0	0	100
7	Physics-2		1		4	20	30	12	13	75
8	Chemestry-2		1	2	2	20	30	12	13	75
9	Computer application-2		0	2	2	0	0	25	25	50
10	Self-employment		2	0	2	20	30	0	0	50
	Total of compulsory subject		14	8	22	280	420	150		850
11	Trade -1		3	9	11	40	60	50	50	200
12	Trade - 2		3	9	11	40	60	50	50	200
13	Industrial attachment (6 weeks)		0	0	0	0	0	25	25	50
	Optional subject any one from below		20	26	46	360	540	400		1300
14	Higher math-2		2/0	0/2	2	30	45	12	13	100
	Agricultutre-2		2/0	0/2		30	45	12	13	
	Bangladesh & world-2		2	0		40	60	0	0	
	Islamic Histiry-2		2	0		40	60	0	0	
	Total period				48	In total marks				1400

2.7 The structure of SSC (Voc.) and Dakhil (Voc.) in Bangladesh

The Financial policy Express (2009) recommends for some form of technical and vocational education to be introduced at all secondary level institutions. Accordingly, Madrasah education will be restructured by including information technology and vocational training among compulsory subjects. It has also recommended formation of a non-government teachers' commission. Such broad proposals are to be welcomed, specially the one requiring all students to be taught certain compulsory subjects such as science and mathematics at the primary and secondary levels. The students who were successfully completed their Junior School Certificate (JSC) or Junior Dakhil Certificate (JDC) examination are allowed to be admitted into SSC (Voc.) or Dakhil (Voc.) class IX level. Their age limits from 12 to 18 years and time duration is continuously four (4) years. However, they can extend this duration by maximum one year upon taking permission from BTEB.

Figure 2.1: Flow chart structure of SSC (Voc.)
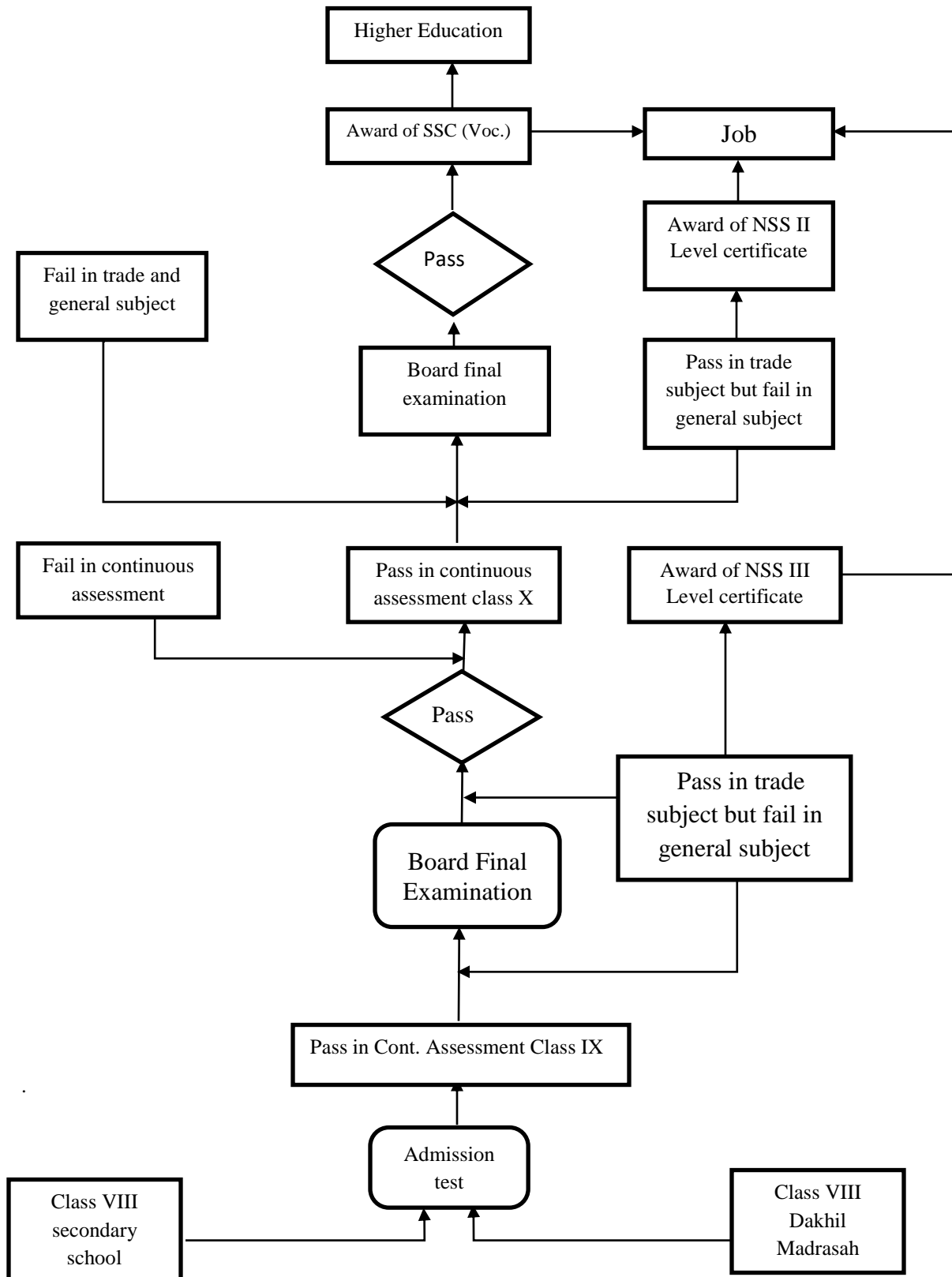
On the completion of SSC (Voc.) program a student along with general subject will achieve the level of National Skill Standard (NSS) II. Students passing only the Trade portion of class IX and X, but failing the general subjects, will be awarded NSS III and II certificate respectively by the BTEB. Furthermore, all the detailed information about curriculum and syllabus are illustrated through a flow chart in the previous page.

Table 2.6: Course offered by Bangladesh Technical Education Board (BTEB) for SSC (Voc.) and Dakhil (Voc.)

SSC (Vocational) or Dakhil (Vocational)	JSC or JDC for SSC (Voc.) and JDC for Dakhil (Voc.)	1	Agro based Food
		2	Architectural Draft with CAD
		3	Automotive
		4	Building Maintenance
		5	Ceramic
		6	Civil Construction
		7	Civil Drafting with CAD
		8	Computer and Information Technology
		9	Dress Making
		10	Dying, Printing and Finishing
		11	Electrical Maintenance Works
		12	Farm Machinery
		13	Fish Culture and Breed
		14	Food Processing and Preservation
		15	Fruit and Vegetable Cultiva
		16	General Electrical Works Technology
		17	General Electronics
		18	General Mechanics
		19	Glass
		20	Livestock Rearing and Farming
		21	Machine Tools Operation
		22	Mechanical Drafting with CAD
		23	Knitting
		24	Patient Care
		25	Plumbing and pipe Fitting
		26	Poultry Rearing and Farming
		27	Refrigeration and Air Conditioning
		28	Shrimp Culture and Breeding Preservation
		29	Weaving
		30	Welding and Fabrication
		31	Wood Working

2.8 Determinants of Student Academic Performance

The development of student performance depends on many factors. Among others, it depends on social, political and economic systems, on the macro level. TVET Act, guidelines/directives, technical and vocational institution law/ regulations, teachers'/ trainers' qualification, curricula, organizational structure, educational science/ didactic related theories on the meson level, and various other factors such as the individual learning ability of the students (cognitive, non-cognitive), individual learning activities, process characteristics of teaching and industrial training/attachment, classroom context, school/enterprise context, on the micro-level (Nickolaus, 2008, p. 10).

Large-scale studies have repeatedly found a close link between educational achievement and family background in Germany. Ballerd (2004) identified that family is one of the most important out-of-school contexts for achieving competences. Institutional and individual context factors are fundamental for competence developments, and can be concluded that student performance is determined in a complex manner by individual, school and family condition factors equally. However, it remains unclear how these different determinants interact and/or mutually influence each other (Vogt & Rogalla, 2009).

Intelligence and prior knowledge are particularly significant determinants for competence development. Research results support that the human brain has an excellent adapting ability. However, the perception differs from person to person, depending on individual learning history and prior knowledge. Learning depends on prior knowledge during solving knowledge rich problems. On the basis of studies of research literature, Frykholm (1993) estimated that contributions of prior knowledge for the various explanation of success in learning are 30 to 60%. Beaumont-Walters & Soyibo, 2001 elaborated further as student performance is very much dependent on SEB (socio economic background) as per their statement, "high school students' level of performance with statistically significant differences is linked to their gender, grade level, school location, school type, student type and socio-economical background".

It has been proved empirically that motivation and interest factors correlate notably with student performance (Pekrun & Schiefele, 1996) explain that the interest in learning content affects positively, since a learner applies in-depth and comprehensible learning strategies here, for example, organization and elaboration. On the other hand, he or she applies superficial learning strategies if there is a lack of interest. The interest varies through with the course of schooling time, depending on the learner's interest in subject matters (curriculum content). For example, there can be an increased interest in a particular subject or topic that makes other subjects less interesting. Research results show that learners are not motivated 'to learn everything' regardless of the personal importance of learning contents, as an "omnivore" (Schiefeleet al., 1993, p. 139).

2.9 Some Findings of Research in Student Performance

Although student performance is a vital issue, only a few studies on performance of polytechnic students in Bangladesh were carried out at Diploma level. Rahman (2010, p. 44) studied the performance of students having SSC (Vocational) and SSC (others). He conducted a study on twelve polytechnics and found no significance difference in performance in their studies. Sarker (2010, p. 34-35) compared the academic performance of students of Polytechnics in Dhaka and Rajshahi Division. The student performance of this division was not statistically significant at 0.05 levels. A study of correlation between admission test result and Diploma-in-Engineering First Semester result of Polytechnic Institutes in Bangladesh was carried out by Shamshad, K. (2011). In his study he considered four Polytechnics and included students of Electrical, Civil, Mechanical and Power Technologies. Out of 15 groups of students 11 groups had statistically significant positive correlation between admission test result and first semester result. A similar study was carried out by Almaq, K.A. (2011). In his study he considered students of Islamic University of Technology (IUT) and found that there was a positive correlation between the admission test result and first semester result. A study on the students' performance throughout the course of study in polytechnic institute was carried out by Sarker (2013). In his study he considered five government polytechnics from three divisions in Bangladesh and included students of Power Technologies and found that there was positive relationship among the Board Final Exam results and Internal Exam results with some exceptions.

2.10 Previous Research Findings on Factors Affecting Student Performance

Numerous studies have examined the factors that influence academic performance in primary and secondary education as well as at tertiary level, with the purpose of enhancing learning at these stages and reducing drop-out rates. Understanding different parameters which contribute to low or high achievement is a frequent topic.

Personal characteristics have been recognized by a number of studies as one the factors affecting academic performance, these include sex, age, ability, parenthood, housing expenditures, social background, time spent on studies, time spent on paid work and motivation (Bugge & Wıkan, 2012). In addition, they were stated that gender is important in explaining academice performance of students. Likewise Islam (2014) comfirmed gender of the students showed significant independent effect on CGPA. However other results from different studies have been showed no significant effect on academic performance with regards to gender (Odeh, 2007;). Other studies identified students' attitude/interest in the course as one of the factors which have got a profound effect on the academic achievement. Fenollar et al. (2007), Kraft and Singhapakdi (1991) as cited by Osaikhiuwu (2014) confirmed that students with strong work ethics (which are influenced by attitude/interest) are strongly committed to their work, more dedicated, focused and tend to perform better than their peers. Furthermore, Thamavithya, n.d., identified other personal issues influencing academic achievement; (a) Financial difficulties, (b) physical illness, health problems, injury, (c) use of alcohol or other substance abuse, (d) pressure, stress, tension, anxiety, (e) loneliness, lack of emotional control, (f) can't find meaning for anything, no motivation and (g) conflicts with social obligations/activities. Social related factors have also been recorgonised by a number of studies to have noteable effect on academic perofrmance (Thamavithya, n.d., Umar, Shaib, Aituisi, Yakubu, & Bada, 2010)

Institutions are engines for economic growth dedicated to developing skilled workforce (Osaikhiuwu, 2014), the environment present at the institution, academic or non-academic has got a bearing on the academic performance of its students, if the institution provide an accomodating and conducive environment, it is most likely to improve the performance of its student, otherwise the performance will be negatively affected.

Institutional academic factors that have been identified to affect performance inlcude physical facilities, institutional policy on class attendance, library facilities, enrollment percentages, availabilty and qualification of institutional academic staff, teaching methods and the evaluation system (Ali, 2013) . The institutional variables such as unfavourable learning conditions, interrupted water supply, poorly equipped library, overcrowded exam time table, incessant strike and closure of school among other variables do have any significant impact on students' performance (Osaikhiuwu, 2014). Romer (1993) as cited by Osiakhiuwu (2014), recognized the importance of class attendance in enhancing students' performance, stating that in his economics class, students who attended class regularly achieved better grades. The geographical location of the educational institution also influence academic performance where by institutions located in urban areas record students with a higher academic performance than their rural counterparts.

2.11 Future Challenges in Industry International Perspective

The vocational education should be concerned with the continuous arrangement of future requirements combined up-to-date technical competencies. Within a global environment, skill workers will need new lifelong learning schemes to assist in conformity with the pace of change in the industrial working skills.

Beside general education it is required to have technical education at the secondary level based on the needs. VET is influential because *firstly,* it appeals to numerous groups, especially in its more general forms. *Secondly*, it attracts students in hunt of jobs, businesses looking for trained workers for removing social and economic problems and educators searching students, who are considered to perform an important social function. *Thirdly*, it helps to serve several contradictory roles of education at the same time and this quality can be termed as the power of 'vocationalism'. *Fourthly*, it promises to reward individual students while still dealing with more combined goals like unemployment and national development. *Fifthly*, it can prepare students for successful and commanding great respect of professions while still facilitating a common core values and knowledge. Finally, it facilitates equality of opportunity through education within unequal societies where the forces to repeat inequality are even bigger (Tilak, 1988).

CHAPTER- III

METHODOLOGY OF RESEARCH

3.1 Introduction

The purpose of this study was to compare academic achievement between SSC (Voc.) in High School students' and Dakhil (Voc.) in Madrasah students as well as between male and female students of these institutions. The study also aimed to identify the impact of an integrated curriculum and others academic environmental factors towards the motivation of students, self-perception and academic achievement. This chapter describes methods used for data collection, analysis, and interpretation. A quantitative method was used in this research examination, which includes research design, area of the study, population, sample and work schedule.

3.2 Design of the Study

1. Research field: High Schools and Madrasahs, those are currently operating S.S.C (Voc.) and Dakhil (Voc.) programs in different parts of the country. The area of research study covered all the relevant institutes nationwide but samples were taken from rural area basically because it was difficult to find out Dakhil (Voc.) Madrasah in urban places. Division/district wise list was prepared like Rangpur-Dinajpur; Mymensingh-Mymensingh; Dhaka-Tangail, Gazipur, Manikgonj; Chittagong-Bramhanbaria; Barisal-Barisal.

2. Population: The study was conducted on the certificate level program of SSC (Voc.) and Dakhil (Voc.) students' and their academic performance and different types of difficulties faced by these students. There are 31 trades are in operation at SSC (Voc.) in High School, Technical School and College (TSC), Technical Training Center (TTC) and Dakhil (Voc.) in Madrasah. The researcher had taken only three (3) out of thirty one (31) trades. The population includes all 860 MPO or others non MPO High Schools and 13 MPO or others 74 non MPO Madrasahs under the Bangladesh Technical Education Board (BTEB). This study involved institutional information given by the administrators, teachers specially trade instructor who were closely involved with vocational students and graduated and regular students of respective trade and institution.

3. Sampling: To make the sampling process convenient, 5 out of 8 divisions and within these 5 divisions, 7 out of 64 districts in Bangladesh were considered first and then 5 High Schools and 7 Madrasahs having vocational courses in operation were chosen from the selected districts and divisions. Among the High Schools and Madrasahs, only Electrical, Computer and Dressmaking trades were considered. Purposive sampling was used to select the institutes from the districts/divisions. Two types' data were considered in this study, one was CGPA of graduated students who participated in SSC (Voc.) and Dakhil (Voc.) public examination held in academic year of 2017, another one was statement wise opinion of regular and few graduated students.

There were 203 students participated in the SSC (Voc.) and 198 students participated in the Dakhil (Voc.) exam 2017 from the selected institutes. The researcher had taken all the students as sample which is shown in the subsequent sections using separate tables.

Table-3.1: School reflected as institute wise SSC (Voc.) students' sample for CGPA analysis.

Division	Name of the institute	Name of trades			Total
		General electrical	Dress-making	computer	
Rangpur	Muradpur High School	21	17	-	38
Mymensingh	Uchakhila Ml High School	25		29	54
Dhaka	Singardak Ideal High School	23	09	-	32
Chittagong	Islampur Alhaj Kazi Rafiqul Islam High School	25	26	-	51
Barisal	Talukderhat Higher secondary School	22	6	-	28
Total		116	58	29	203

Table-3.2: Madrasah reflected as institute wise Dakhil (Voc.) students' sample for CGPA analysis

Division	Name of the institute	Name of trades			Total
		General electrical	Dress-making	computer	
Rangpur	Uthrail Seddikia Kamil Madrasah	-	11	20	38
Mymensingh	Issarganj DS Kamil Madrasah	22		20	54
Dhaka	Baliati Dakhil Madrasah	24	-	14	38
	Bibadia Islamia Dakhil Madrasah	21	23	-	51
Chittagong	Alhaj Amena Begum Darul Quran Dakhil Madrasah	-	17	20	37
Barisal	Baghia Al-Amin Multilateral Kamil Madrasah	06	-	-	06
Total		73	51	74	198

The comparison of School and Madrasah with respect to gender composition of the sample is illustrated in Table 3.3 below:

Table-3.3: Students sample of School and Madrasah and also reflection of male and female.

Institute	Male	Female	Total
School	138	65	203
Madrasah	155	43	198
Total	293	108	401

For the statement wise comparison, there were 292 students enrolled in class X of the SSC (Voc.) High schools and 318 students enrolled in class X of the Dakhil (Voc.) Madrasahs.

Students were selected based on stratified random sampling technique for statement wise opinion. Moreover, respective trade teachers' opinion also gathered from their institutes, which is shown at Table 3.4 below. The sample size for this study consisted of 100 students for SSC (Voc.) and 100 students for Dakhil (Voc.).

Table-3.4: Statement opinion sample calculated table for SSC (Voc.) students.

Name of the institute	Number of the trade teachers	Number of enrolled students	Calculation of sample size	Total sample
Muradpur High School	4	33	33*100/292	12
Uchakhila Ml High School	4	82	82*100/292	28
Singardak Ideal High School	4	67	55*100/292	23
Islampur Alhaj Kazi Rafiqul Islam High School	4	51	51*100/292	18
Talukderhat Higher secondary School	2	45	45*100/292	15
Tangail polytechnic (Graduated student)	-	14	-	04
		=292		=100

Table-3.5: Statement opinion sample calculated table for Dakhil (Voc.) students.

Name of the institute	Number of the trade teachers	Number of enrolled students	Calculation of sample size	Total sample
Uthrail Seddikia Kamil Madrasah	3	45	-	10
Issarganj DS Kamil Madrasah	1	60	60*100/318	19
Baliati Dakhil Madrasah	3	47	-	17
Bibadia Islamia Dakhil Madrasah	-	72	72*100/318	23
Alhaj Amena Begum Darul Quran Dakhil Madrasah	2	45	45*100/318	15
Baghia Al-Amin Multilateral Kamil Madrasah	2	27	27*100/318	09
Tarafpur Darussunna Multilateral Dakhil Madarasah	1	17	-	07
		=318		=100

Teacher sample-

    1.   Trade: Electrical, Computer and Dressmaking

    2.   Teacher's experience: minimum 2 years

    3.   Age: 20 to 50 years

Student sample-

    1.   Trade: Electrical, Computer and Dressmaking

    2.   Gender: male and female

    3.   Age: 13 to 20 years

3.3 Data Collection Tools.

Questionnaire was considered as one of the primary media for gathering data or information in education and social science research. In this study structured form of questionnaire was used as data collection tool. In consultation with supervisors, the researcher had prepared appropriate questionnaires to collect data from students, and teachers of the selected educational institutions in Bangladesh.

SSC (Voc.) and Dakhil (Voc.) results were collected from BTEB website, which was already published. The questionnaire consisted of fill-up the gap, short answer type and statement wise opinion within the five-point rating scale. These items were supplemented by few open ended textual questions were provided on the best aspects of participants' educational experience and problems faced by them at their respective institutions. Statement wise data format were designed on 5 point rating scale for students and teachers as illustrated below:

    1. Strongly agree(SA)

    2. Agree(A)

    3. Undecided (U)

    4. Disagree(D)

    5. Strongly disagree(SD)

The researcher himself printed the hardcopy and distributed the questionnaire. In this regard, data from the selected institutes were collected by the researcher himself and few teachers from the relevant institutes extended their help to distribute questionnaire to other institutes.

3.4 Data Collection Procedures

The data collection procedures are given below:

1. List of the institute and mobile number of institute were collected by the researcher himself through www.moe.gov.bd website and requested the Head of the institute and relative trade teachers as per their schedule and willingness. Then researcher went to the actual field and distributed questionnaires to them for data collection.
2. Among 200 students sample, researcher himself and through his personally known teachers, and friends collected the data.
3. Among the 120 delivered questionnaires 50% were returned, then the researcher himself took the initiative to fulfill the targeted 200 sample.
4. CGPA data collected from BTEB website but male female students were identified by the respective institute teachers and authorities.
5. Sample respondents had realized and understood the statements of the questionnaire and given their opinion in the of 5-point Likert scale format. Researcher helped them to realize the statements of the questionnaire.
6. After compiling all data gathered and received, then the researcher conducted data analysis and interpretation with the assistance of SPSS 20 software.

3.5 Detailed Description of Questionnaires

Total of two hundred ninety three (293) male students' CGPA data were considered in the sample. Frequency of School and Madrasah students, their valid percent with cumulative percent is statistically illustrated in table 3.6 given below:

Table 3.6: Respondents Institute percentages for male participants

		Frequency	Percent	Valid Percent	Cumulative Percent
	School	138	47.1	47.1	47.1
Valid	Madrasah	155	52.9	52.9	100.0
	Total	293	100.0	100.0	

Total of one hundred and eight (108) female students' CGPA data were considered in the sample. Frequency of School and Madrasah students, valid percent with cumulative percent is statistically illustrated in table 3.7 given below:

Table 3.7: Respondents Institute percentages for female participants

		Frequency	Percent	Valid Percent	Cumulative Percent
	School	65	60.2	60.2	60.2
Valid	Madrasah	43	39.8	39.8	100.0
	Total	108	100.0	100.0	

Total of two hundred and three (203) SSC (Voc.) students' CGPA data were considered in the sample. Frequency of male and female, valid percent with cumulative percent is statistically illustrated in table 3.8 given below:

Table 3.8: Respondents Gender percentages for School participants

		Frequency	Percent	Valid Percent	Cumulative Percent
	Male	138	68.0	68.0	68.0
Valid	Female	65	32.0	32.0	100.0
	Total	203	100.0	100.0	

Total of one hundred ninety eight (198) Dakhil (Voc.) students CGPA data were considered in the sample. Frequency of male and female, valid percent with cumulative percent is statistically illustrated in table 3.9 given below:

Table 3.9: Respondents Gender percentages for Madrasah participants

		Frequency	Percent	Valid Percent	Cumulative Percent
	Male	155	78.3	78.3	78.3
Valid	Female	43	21.7	21.7	100.0
	Total	198	100.0	100.0	

A total of two hundred (200) respondents were considered in the sample and questionnaires were distributed to them. Total of two hundred (200), (100%) questionnaires were returned without missing questions as statistically illustrated in table 3.10 below:

Table-3.10: Statement wise respondents Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
A1. You have full confidence /understanding in Mathematics	200	100.0%	0	0.0%	200	100.0%
A2. You have full confidence/understanding in Science (Physics, Chemistry)	200	100.0%	0	0.0%	200	100.0%
A3. You confident in your English language proficiency	200	100.0%	0	0.0%	200	100.0%
A4. You feel you are competent in your Trade subject	200	100.0%	0	0.0%	200	100.0%
A5. Practical works are very much easy	200	100.0%	0	0.0%	200	100.0%
A6. You do practical work by yourself	200	100.0%	0	0.0%	200	100.0%
Institute based statement: B1. The institute has adequate number of labs.	200	100.0%	0	0.0%	200	100.0%
B2. The institute has sufficient tools, machines and row materials for practical job.	200	100.0%	0	0.0%	200	100.0%
B3. As a student you are properly motivated for practical class.	200	100.0%	0	0.0%	200	100.0%
B4. Teachers have sufficient skill for conducting practical class properly.	200	100.0%	0	0.0%	200	100.0%
B5. The institute has available special facilities (Toilet, female common etc.)	200	100.0%	0	0.0%	200	100.0%

3.6 Tools and Technique of Data Analysis

After data collection, the information was tabulated in the Statistical Package for Social Science (SPSS) version 20.0. This software was used for analyzing and interpreting the data obtained. Independent sample t test was used to find out whether there was any significant difference exists between the academic performance of SSC (Voc.) and Dakhil (Voc.) students as well as between male and female students in their respective institutions. The mean and standard deviation calculated but basically the sig. (p value) value was compared to the fixed value of 0.05 in SPSS. In this case, nothing else was required including critical value, significance level and degree of freedom.

To examine the hypothesis for each statement of the questionnaire, two-independent-samples test (non-parametric) was used, where Mann-Whitney-Wilcoxon (MWW) test were selected to generate MWW sig. value (p value) to compare with the fixed value of SPSS in order to make a decision regarding a particular statement. Category percentage for each opinion and weighted average were calculated and then tabulated, followed by its detailed interpretation. These tests were considered in the study basically for identifying problems and prospects of the integrated curriculum and institutional environmental factors experienced by the SSC (Voc.) and Dakhil (Voc.) students.

3.7 Ethical Consideration

Before starting any data collection, the researcher was seeking required permission from the participating High Schools and Madrasahs authority or administrative body. To make the process systematic an invitation letter signed by the Head, Department of Technical and Vocational Education, Islamic University of Technology (IUT), had been forwarded to the appropriate authorities of the participating institutions. Each and every participant was given a questionnaire and required time was also given to fill the questionnaire voluntarily. All the participants' information were used and kept confidential with utmost care.

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

In this section, statistical procedures are presented that were used to analyze both the continuous and categorical data collected from students and teachers of different High Schools and Madrasahs in Bangladesh. In order to investigate objectives 1 to 4, t-test were conducted on continuous data comprising GPA/CGPA obtained by the students of SSC (Voc.) and Dakhil (Voc.) in different final examinations, whereas statement-wise category percentage, weighted average and Mann-Whitney test were conducted on the responses collected using 5-point rating scale in order to examine objective 5. The subsequent sections of this chapter present a brief description of the used statistical tests, their rationale followed by the step by step process of computing test statistic with interpretation.

4.1 T-Test

The t-test assumes various conditions, which includes normal distribution, homogeneity of variances, symmetry related to characteristic distribution of the dependent variable. Should one or more of the conditions be violated, requires the use of alternative test procedures (Diehl & Staufenbiel, 2001). There are several kinds of t-tests, but two-sample t-test was used to compare the mean values of GPA/CGPA between High School and Madrasah and between male and female students. These tests are often referred to as unpaired or independent samples t-test, as they are typically applied when the statistical units underlying the two samples being compared are non-overlapping. This inferential statistic was used to verify if there is any significant performance difference among students of different groups.

It is to be mentioned that the academic performance of the students of both SSC (Voc.) and Dakhil (Voc.) is measured by final examinations (summative evaluation) and is recorded as individual grade point average (GPA) and, then cumulative grade point average (CGPA). : In order to examine this hypothesis CGPAs obtained by the students of five High School and seven Madrasahs result were collected from BTEB and then examined. Students of High Schools were considered in Group-1 and Madrasahs were considered in Group-2.

The null hypothesis, which is assumed to be true until proven wrong, is that there is no significant difference between two groups in terms of academic performance. In this research study the two groups of students (High School and Madrasah or male and female) may have different mean values for GPA/CGPA but it requires to be checked whether there is any real difference between these two mean values, or it is just occurred by chances. The t-test statistic determines a p-value (probability value) that indicates how likely these results could have been obtained by chance. By convention, if the p-value is less than 0.05 ($p < 0.05$), it is concluded that the null hypothesis can be rejected (i.e., there is a difference between groups). In other words, when $p<0.05$, it can be interpreted that the differences/results are statistically significant (Bortz, 2005; Diehl & Staufenbiel, 2001).

Test for Homogeneity of Variances using Levene Test

The applicability or robustness of a t-test is linked to the homogeneity of variances. The test for compliance of variance homogeneity of distributions is made by Levene test. This test is integrated in the t-test function in SPSS. If the test fails significantly, the robust Welch-test is applied (Diehl & Staufenbiel, 2001). Welch's t-test is an adaptation of t-test, that is, it has been derived with the help of t-test and is more reliable when the two samples have unequal variances and unequal sample sizes. While t-test (Student's t-test) assumes that the two populations have normal distributions and with equal variances, Welch's t-test is designed for unequal variances, but the assumption of normality is maintained.

Proof of hypotheses

To prove or disprove the hypotheses in this study the quantitative methods of research were used. The data was collected from different High Schools and Madrasahs geographically scattered all around the country and then tabulated in SPSS version 20 software.

4.1.1 Comparison of Male Students' Academic Performance between High School and Madrasah Education

Step I- Hypothesis formulation: There was no significant difference in academic performance of male students of High School and Madrasah.

Step II- Computation of test statistic using SPSS: As illustrated in Table 4.1, the mean and standard deviation of CGPAs in the final examinations of SSC (Voc.) students in High School were 3.8718, 1.61692 and Dakhil (Voc.) students in Madrasah were 3.5412, 1.78598 respectively. It was found that the mean value of CGPAs obtained by male students of High School was higher than that of Madrasah as well as their standard deviation was comparatively low. However, it was required to conduct inferential statistics in order to draw conclusion about the hypothesis.

Table 4.1 Statistics of male student's performance over SSC (Voc.) and Dakhil (Voc.)

Group Statistics					
	Institute	N	Mean	Std. Deviation	Std. Error Mean
GPA	School	138	3.8718	1.61692	.13764
	Madrasah	155	3.5412	1.78598	.14345

Step III- Testing null hypothesis and draw conclusions: In order to verify if the difference between the averages values of the two groups stated above was statistically significant or not, '*Two-samples t-test*' was carried out. The findings of this test are outlined in Table 4.2.

Table 4.2 Male student's performance over SSC (Voc.) and Dakhil (Voc.) using t-test

Independent Samples Test									
		Levene's Test for Equality of Variances		t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
									Lower	Upper
GPA	Equal variances assumed	5.039	.026	1.653	291	.099	.33059	.19996	-.0629	.72413
	Equal variances not assumed			1.663	291	.097	.33059	.19881	-.0607	.72187

Now the sig. value of Levene's test for equality of variances was 0.026, which was less than p-value < 0.05. So the null hypothesis was rejected, that implies equal variances not assumed. Therefore, sig. (2-tailed) value for two samples t-test was .097. As .097 was greater than p-value, .05, this proves that the null hypothesis was (not rejected) accepted. Thus, it can be concluded that there was no significant difference in academic performance of male students between High School and Madrasah in the respective cases.

4.1.2 Comparison of Female Students' Academic Performance between High School and Madrasah Education

Step I- Hypothesis formulation: There was no significant difference in academic performance of female students of High School and Madrasah.

Step II- Computation of test statistic using SPSS: As illustrated in Table 4.3, the mean and standard deviation of CGPAs in the final examinations of SSC (Voc.) students in High School were 4.2765, 1.25738 and Dakhil (Voc.) students in Madrasah were 3.8798, 1.59492 respectively. It was found that the mean value of CGPAs obtained by female students of High School was higher than that of Madrasah as well as their standard deviation was comparatively low. However, it was required to conduct inferential statistics in order to draw conclusion about the hypothesis.

Table 4.3 Statistics of female student's performance over SSC (Voc.) and Dakhil (Voc.)

Group Statistics					
	Institute	N	Mean	Std. Deviation	Std. Error Mean
GPA	School	65	4.2765	1.25738	.15596
	Madrasah	43	3.8798	1.59492	.24322

Step III- Testing null hypothesis and draw conclusions: In order to verify if the difference between the averages values of the two groups stated above was statistically significant or not, '*Two-samples t-test*' was carried out. The findings of this test are outlined in Table 4.4.

Table 4.4 Female student's performance over SSC (Voc.) and Dakhil (Voc.) using t-test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
G P A	Equal variances assumed	3.792	.054	1.441	106	.153	.39669	.27538	-.14926	.94265
	Equal variances not assumed			1.373	75.28	.174	.39669	.28893	-.17885	.97224

Independent Samples Test

Now the sig. value of Levene's test for equality of variances was 0.054, which was greater than p-value < 0.05. So the null hypothesis was not rejected, that implies equal variances assumed. Therefore, sig. (2-tailed) value for two samples t-test was .153. As .153 was greater than p-value, .05, this proves that the null hypothesis was not rejected. Thus, it can be concluded that there was no significant difference in academic performance of female students between High School and Madrasah in the respective cases.

4.1.3 Comparison of High School Students' Academic Performance between Male and Female

Step I- Hypothesis formulation: There was no significant difference in academic performance of High School students between male and female.

Step II- Computation of test statistic using SPSS: As illustrated in Table 4.5, the mean and standard deviation of CGPAs in the final exams of SSC (Voc.) in High School male students were 3.8718, 1.61692 and female students were 4.2765, 1.25738 respectively. It was found that the mean value of CGPAs obtained by female students of High School was higher than that of male students as well as their standard deviation was comparatively low. However, it was required to conduct inferential statistics in order to draw conclusion.

Table 4.5 Statistics of High School student's performance over male and female

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
GPA	Male	138	3.8718	1.61692	.13764
	Female	65	4.2765	1.25738	.15596

Step III- Testing null hypothesis and draw conclusions: In order to verify if the difference between the average values of the two groups stated above was statistically significant or not, the '*Two-samples t-test*' was carried out. The findings of this test are outlined in Table 4.6.

Table 4.6 High School student's performance over male and female using t-test

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
GPA	Equal variances assumed	7.386	.007	-1.779	201	.077	-.40465	.22742	-.85309	.04379
	Equal variances not assumed			-1.945	157.8	.045	-.40465	.20801	-.81549	.00619

Now the sig. value of Levene's test for equality of variances was 0.07, which was less than p-value < 0.05. So the null hypothesis was rejected, that implies equal variances not assumed. Therefore, sig. (2-tailed) value for two samples t-test was .045. As .045 was less than p-value, .05, this proves that the null hypothesis was rejected. Thus, it can be concluded that there was a significant difference in academic performance of high school students between male and female in the respective cases.

4.1.4 Comparison of Madrasah Students' Academic Performance between Male and Female

Step I- Hypothesis formulation: There was no significant difference in academic performance of Madrasah students between male and female.

Step II- Computation of test statistic using SPSS: As illustrated in **Table 4.7**, the mean and standard deviation of CGPAs in the final exams of Dakhil (Voc.) in Madrasah male students were 3.5412, 1.78598 and female students were 3.8798, 1.59492 respectively. It was found that the mean value of CGPAs obtained by female students of Madrasah was higher than that of male students as well as their standard deviation was comparatively low. However, it was required to conduct inferential statistics in order to draw conclusion about the hypothesis.

Table 4.7 Statistics of High School student's performance over male and female

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
GPA	Male	155	3.5412	1.78598	.14345
	Female	43	3.8798	1.59492	.24322

Step III- Testing null hypothesis and draw conclusions: In order to verify if the difference between the average values of the two groups stated above was statistically significant or not, the '*Two-samples t-test*' was carried out. The findings of this test are outlined in Table 4.8.

Table 4.8 Madrasah student's performance over male and female using t-test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
									Lower	Upper
G P A	Equal variances assumed	3.106	.080	-1.124	196	.262	-.33854	.30108	-.93230	.25522
	Equal variances not assumed			-1.199	73.86	.234	-.33854	.28238	-.90121	.22412

Independent Samples Test

Now the sig. value of Levene's test for equality of variances was 0.80, which was greater than p-value < 0.05. So the null hypothesis was not rejected, that implies equal variances assumed. Therefore, sig. (2-tailed) value for two samples t-test was .262. As .262 was greater than p-value, .05, this proves that the null hypothesis was not rejected. Thus, it can be concluded that there was no significant difference in academic performance of Madrasah students between male and female in the respective cases.

During the process of examining the objectives 1 to 4 of this study, it was observed from the above discussion that three out of four cases, there was no significant difference between the groups in terms of academic performance. These groups include male students' academic performance between High School and Madrasah Education, female students' academic performance between High School and Madrasah Education, and Madrasah students' academic performance between Male and Female. However, a significant difference was observed in the academic performance of High School students between male and female. The next section presents analysis and interpretation regarding the 5th objective of the study.

4.2 Identify the impact of integrated curriculum and environmental factors at the secondary level School and Madrasahs' experienced by SSC (Voc.) and Dakhil (Voc.) students.

The fifth objective was to assess the impact of integrated curriculum and environmental factors at the secondary level School and Madrasahs' experienced by SSC (Voc.) and Dakhil (Voc.) students. A structured questionnaire was administered to the students and teachers of different high schools and Madrasahs in Bangladesh. The data obtained from the respondents were tabulated in SPSS version 20. The questionnaire was carefully formulated in order to elicit opinion of the students and teachers regarding subject matter, practical components, classroom and laboratory situations, institutional facilities, and competency and training requirements. It comprised of sixteen statements for students and seven statements for teachers inviting responses on five-point rating scale i.e. strongly agree to strongly disagree. Category percentage, weighted average and Mann-Whitney-Wilcoxon (MWW) test (instead of chi-square test) were conducted on the responses of each statement of the questionnaire to check whether responses on the statement varies between groups or not.

Likert questionnaires are widely used in survey research, but it is unclear whether the item data should be investigated by means of parametric or nonparametric procedures. According to de Winter and Dimitra (2010), the chi-square test does not use the ordinal information and treats the different values as nominal groups, which do not have a natural ordering, such as bitter, sweet or sour. 5-point rating scale or Likert data is basically ordinal data, which means it has a natural ordering of values, but yet differences between the levels don't necessarily represent equal intervals. The Mann-Whitney-Wilcoxon test both incorporates the ordinal information that is contained in Likert items and should have more statistical power. By using the chi-square test in these cases, one would be losing ordinal information and probably statistical power to detect the differences between groups (de Winter & Dimitra Dodou, 2010)

The statement-wise category percentage is just the ratio of number of participants from a particular group responded to one of the 5-rating scale (SD/D/U/A/D/SD) of a statement and the total number of respondents for the same statement multiplied by 100.

The weighted average of the opinion of each statement is calculated by using the following formula:

Weighted Average, W. A. $= \dfrac{N_1 + 2N_2 + 3N_3 + 4N_4 + 5N_5}{N_1 + N_2 + N_3 + N_4 + N_5}$ where N_5, N_4, N_3, N_2 and N_1

are the number of respondents who supported "Strongly Agree", "Agree", "Undecided", "Disagree" and "Strongly Disagree" respectively. The five point rating scale is as follows:

Table 4.9 Five-point Likert scale and its numerical distribution

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

The weighted average (WA) is interpreted as:

- WA $\geq$ 4.5 is "Strongly Agree" and 4.5 > WA $\geq$ 3.5 is "Agree".
- 3.5 > WA $\geq$ 2.5 is "Undecided"
- 2.5 > WA $\geq$ 1.5 is "Disagree" and WA < 1.5 is "Strongly Disagree".

To examine the hypothesis for Mann-Whitney test, two-independent-samples test (non-parametric) can run the Mann-Whitney test, which is available from the non-parametric test under 'Legacy Dialogs'. If the sig. value is larger than 0.05, it can be concluded that there is no significant difference between the groups in terms of responses to a particular statement.

The fifth objective of this study was to assess the opinion of students and teachers in different areas, which includes (i) subject matter (theory & practical) and (ii) classroom and laboratory situations, for students and (iv) institutional facilities, competency and training needs for teachers. The subsequent sections present the analysis sequentially based on these areas.

4.2.1 Analysis of students' responses to the statements related to Subject matter (Theory and Practical)

This block of statements covers students' confidence or understanding on subject matter both theory and practical in different subject areas which include Mathematics, Science (Physics, Chemistry), English and Trade subjects. For the 1st statement of this block related to subject matter (theory and practical), statement-wise category percentage and weighted average were

calculated using Crosstab, Mean rank and sig. value of Mann-Whitney-Wilcoxon test was calculated by going to Non-parametric test and then 'Two-Independent-Samples test'. SPSS 20 was used throughout the study.

Table 4.10 Cross tabulation of the students' responses to statement A1

		A1. You have full confidence/understanding in Mathematics					Total
		SD	D	U	A	SA	
High School	Count	1	11	19	36	33	100
	% within Institute	1.0%	11.0%	19.0%	36.0%	33.0%	100.0%
Madrasah	Count	5	5	24	46	20	100
	% within Institute	5.0%	5.0%	24.0%	46.0%	20.0%	100.0%
Total	Count (for WA calculation)	6	16	43	82	53	200

It was observed from table 4.10 that 69% High School students and 66% Madrasah students opined in the category of agree and strongly agree on statement A1, which implies most of the students were positive (agree/strongly agree) regarding the statement. The responses were also in the category of 'Agree' in terms of weighted average [WA= (1x6 + 2x16 + 3x43 + 4x82 + 5x53) / (6+16+43+82+53) = 760/200 = 3.80). The scenario is presented in Figure 4.1.
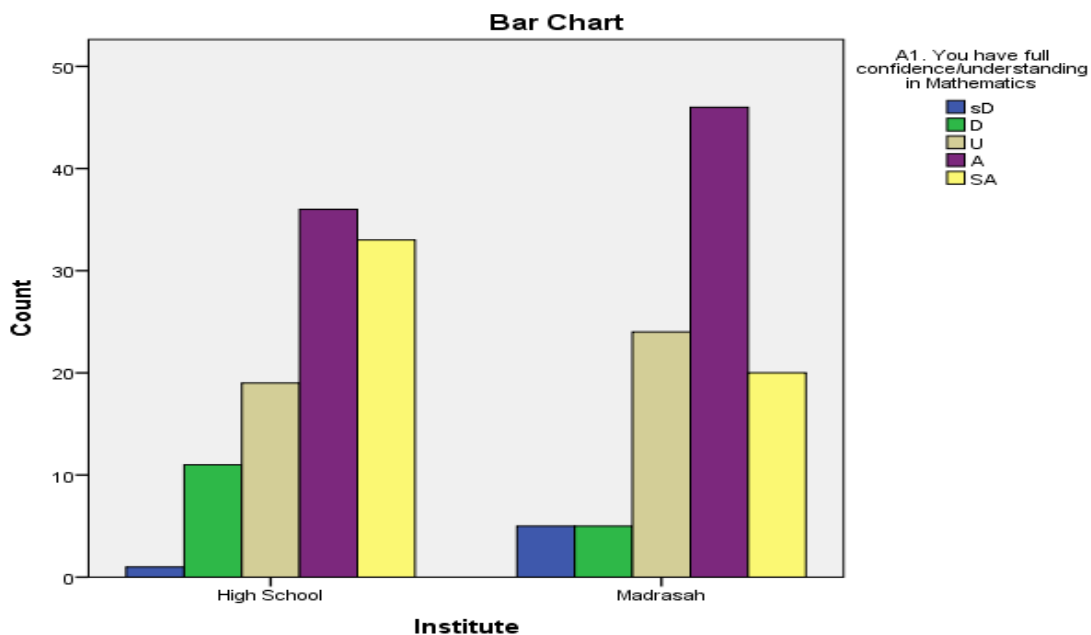
Figure 4.1 Bar chart of the students' responses to statement A1

Meanwhile, mean ranks of High School and Madrasah students were 105.75 and 95.25 respectively and their Sig. value was 0.177 as illustrated in Table 4.11, which is greater than .05 that implies the null hypothesis was not rejected. So, there was no significant difference between High School and Madrasah students in terms of their responses to this statement. As the responses of both High School and Madrasah students were positive (overall 67.5%) and there was no significant difference between them, it can be interpreted that the students' competency of having full confidence/ understanding in Mathematics was good.

Table 4.11 Mann-Whitney-Wilcoxon test of the students' responses to statement A1

Mann-Whitney-Wilcoxon Test						
	Institute	N	Mean Rank		Test Statistics[a]	
A1. You have full confidence/understanding in Mathematics	High School	100	105.75			A1. You have full confidence/understanding in Mathematics
	Madrasah	100	95.25			
	Total	200			Mann-Whitney U	4475.000
					Asymp. Sig. (2-tailed)	.177
					a. Grouping Variable: Institute	

Similarly, other statements of this block can be interpreted using a summarized format as illustrated in Table 4.12. For statement A2, it was observed that 51% High School students and 59% Madrasah students opined in the category of agree and strongly agree, which implies approximately half of the students were positive (agree/strongly agree) regarding the statement. The responses were also in the category of 'Agree' in terms of weighted average (WA= 3.58). Meanwhile, mean ranks of High School and Madrasah students were 102.97 and 98.04 respectively and their Sig. value 0.524, which was greater than .05 that implies the null hypothesis was not rejected. So, there was no significant difference between High School and Madrasah students in terms of their responses to this statement. As the responses of both High School and Madrasah students were positive (overall 55.0%) and there was no significant difference between them, it can be interpreted that the students' competency of having full confidence/ understanding in Science (Physics, Chemistry) was average or somehow good.

Table 4.12: Analysis of students' responses to the statements related to Subject Matter (Theory and Practical)

Sl.	STATEMENTS	STATUS	1(SD)	2(D)	3(U)	4(A)	5(SA)	WA	Mean Rank	MWW Sig.
A1	You have full confidence/understanding in Mathematics	High School	1.0%	11.0%	19.0%	36.0%	33.0%	3.80	105.75	.177
		Madrasah	5.0%	5.0%	24.0%	46.0%	20.0%		95.25	
A2	You have full confidence/understanding in Science (Physics, Chemistry)	High School	0.0%	5.0%	44.0%	32.0%	19.0%	3.58	102.97	.524
		Madrasah	1.0%	17.0%	23.0%	49.0%	10.0%		98.04	
A3	You confident in your English language proficiency	High School	0.0%	10.0%	51.0%	34.0%	5.0%	3.38	97.41	.418
		Madrasah	3.0%	12.0%	38.0%	35.0%	12.0%		103.59	
A4	You feel you are competent in your Trade subject	High School	0.0%	7.0%	13.0%	36.0%	44.0%	3.79	119.70	.000
		Madrasah	8.0%	14.0%	25.0%	36.0%	17.0%		81.31	
A5	Practical works are very much easy	High School	1.0%	0.0%	9.0%	58.0%	32.0%	3.85	118.46	.000
		Madrasah	9.0%	7.0%	28.0%	37.0%	19.0%		82.55	
A6	You do practical work by yourself	High School	1.0%	0.0%	15.0%	55.0%	29.0%	3.69	121.94	.000
		Madrasah	9.0%	15.0%	29.0%	34.0%	13.0%		79.07	

The statement A3 indicates that 39% High School students and 47% Madrasah students have opined in the category of agree and strongly agree, which implies approximately two-fifth of the students (43%) were positive (agree/strongly agree) regarding the statement. The responses were also in the category of 'Undecided' in terms of weighted average (WA= 3.38). Meanwhile, mean ranks of High School and Madrasah students were 97.41 and 103.59 respectively and their Sig. value was 0.418, which was greater than .05 that implies the null hypothesis was not rejected. So, there was no significant difference between High School and Madrasah students in terms of their responses to this statement. As the responses of both High School and Madrasah students were less than 50% and there was no significant

difference between them, it can be interpreted that the students' competency of having confidence in their English language proficiency was below average.

From table 4.12 it was observed that 80% High School students and 53% Madrasah students have opined in the category of agree and strongly agree on statement A4, which implies most of the students were positive (agree/strongly agree) regarding this statement. The responses were also in the category of 'Agree' in terms of weighted average (WA= 3.79). Meanwhile, mean ranks of High School and Madrasah students were 119.70 and 81.31 respectively and their Sig. value was 0.00, which is less than .05 that implies the null hypothesis was rejected. So, there was a significant difference between High School and Madrasah students in terms of their responses to this statement. As the mean rank of Madrasah students was much lower than the High School students, it can be interpreted that they do not feel as competent as High School students in their trade subjects and more specifically, the margin of difference was significant in this regard.

The statement A5 indicates that 90% High School students and 56% Madrasah students have opined in the category of agree and strongly agree, which implies most of the students were positive (agree/strongly agree) regarding this statement. The responses were also in the category of 'Agree' in terms of weighted average (WA= 3.85). Meanwhile, mean ranks of High School and Madrasah students were 118.46 and 82.55 respectively and their Sig. value was 0.00, which was less than .05 that implies the null hypothesis was rejected. So, there was a significant difference between High School and Madrasah students in terms of their responses to this statement. As the mean rank of Madrasah students was much lower than the High School students, it can be interpreted that they do not feel practical works as easier as High School students and the margin of difference was significant in this regard.

The statement A6 indicates that 84% High School students and 47% Madrasah students have opined in the category of agree and strongly agree, which implies most of the students were positive (agree/strongly agree) regarding this statement. The responses were also in the category of 'Agree' in terms of weighted average (WA= 3.69). Meanwhile, mean ranks of High School and Madrasah students were 121.94 and 79.07 respectively and their Sig. value

was 0.00, which was less than .05 that implies the null hypothesis was rejected. So, there was a significant difference between High School and Madrasah students in terms of their responses to this statement. As the mean rank of Madrasah students was much lower than the High School students, it can be interpreted that they were less supportive to the statement of doing practical work by themselves than High School students and the margin of difference was significant in this regard.

So, the overall analysis of students' responses to the statements related to subject matter (theory and practical) was in the category of 'Agree' as the overall weighted average was 3.68 [= (3.80+3.58+3.38+3.79+3.85+3.69)/6]. However, there was a significant difference between High School and Madrasah students in terms of students' competency in trade subjects (A4), easiness of practical works (A5), and doing practical work by themselves (A6). More specifically, opinions of High School students were more positive than Madrasah students to these last three statements A4, A5 and A6 while no significant differences were observed between the two groups in case of first three statements (A1, A2, and A3).

4.2.2 Analysis of students' responses to the statement related to Classroom/Lab situation

This block of statements covers students' responses on classroom/lab situation. Which includes lab facilities, machine tools, raw materials, students' motivation, skill-based training for teachers and special facilities such as toilet, female common room. For the 1st statement (the institute has adequate number of labs) of this block, category percentage, weighted average, mean rank and sig. value of Mann-Whitney-Wilcoxon test was calculated in SPSS.

Table 4.13 Crosstabulation of the students' responses to statement B1

		B1. The institute has adequate number of labs.					Total
		SD	D	U	A	SA	
High School	Count	2	10	46	23	19	100
	% within Institute	**2.0%**	**10.0%**	**46.0%**	**23.0%**	**19.0%**	100.0%
Madrasah	Count	19	35	38	7	1	100
	% within Institute	**19.0%**	**35.0%**	**38.0%**	**7.0%**	**1.0%**	100.0%
Total	Count	**21**	**45**	**84**	**30**	**20**	200

It was observed from table 4.23 that 42% High School students and 8% Madrasah students opined in the category of agree and strongly agree on statement B1, which implies only one fourth of the total students were positive (agree/strongly agree) regarding the statement. The responses were also in the category of 'Undecided' in terms of weighted average [WA= $(1\times21 + 2\times45 + 3\times84 + 4\times30 + 5\times20) / (21+45+84+30+20) = 583/200 = 2.92$]. The scenario is presented in Figure 4.2.
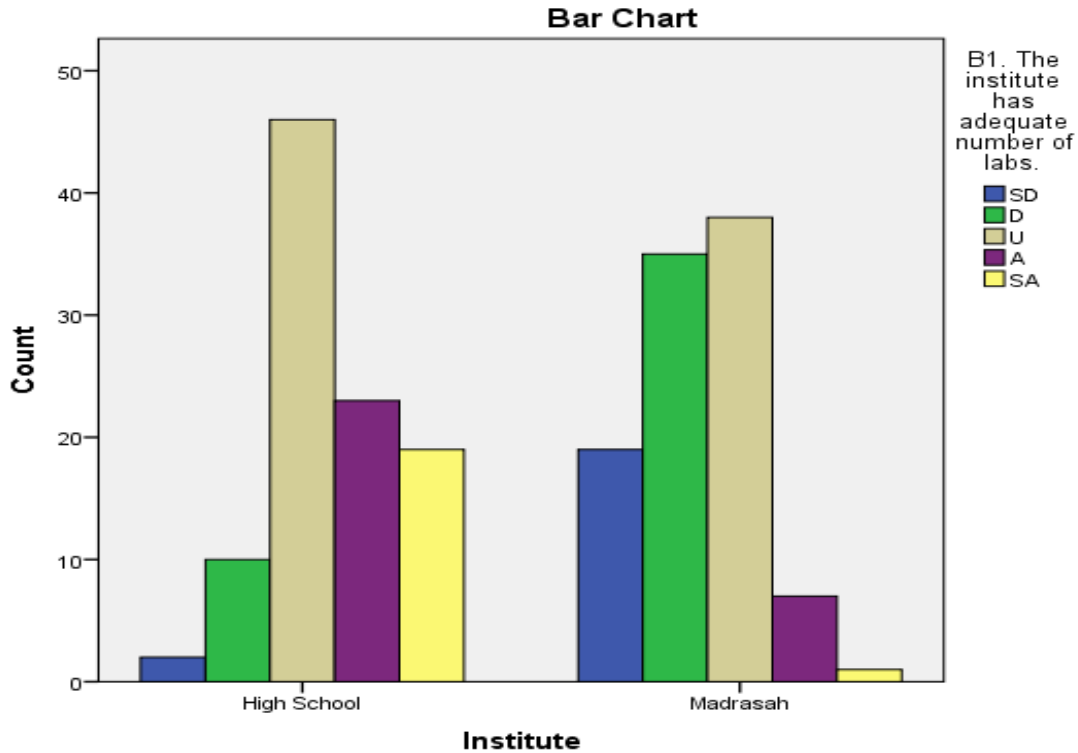
Figure 4.2 Bar chart of the students' responses for statement B1

Table 4.14 Mann-Whitney-Wilcoxon test of the students' responses to statement B1

Mann-Whitney-Wilcoxon Test						
	Institute	**N**	**Mean Rank**		**Test Statistics**[a]	
B1. The Institute has adequate number of labs	High School	100	128.79		B1. The Institute has adequate number of labs	
	Madrasah	100	72.21			
	Total	200				
				Mann-Whitney U		2171.000
				Asymp. Sig. (2-tailed)		.000
				a. Grouping Variable: Institute		

49

Meanwhile, mean ranks of High School and Madrasah students were 128.79 and 72.21 respectively and their Sig. value was 0.00 as illustrated in Table 4.14, which was less than .05 that implies the null hypothesis was rejected. So, there was a significant difference between High School and Madrasah students in terms of their responses to this statement. As the mean rank of Madrasah students was much lower than the High School students, it can be interpreted that there was inadequate number of labs in Madrasah as compared to High School and more specifically, the margin of difference was very significant in this regard.

Table 4.15: Analysis of students' responses to the statement related to classroom/lab situation

Sl.	STATEMENTS	STATUS	1(SD)	2(D)	3(U)	4(A)	5(SA)	WA	Mean Rank	MWW Sig.
B1	The institute has adequate number of labs.	High School	2.0%	10.0%	46.0%	23.0%	19.0%	2.92	128.79	.000
		Madrasah	19.0%	35.0%	38.0%	7.0%	1.0%		72.21	
B2	The institute has enough tools, machines and raw materials for practical job.	High School	6.0%	13.0%	32.0%	29.0%	20.0%	2.99	122.44	.000
		Madrasah	18.0%	31.0%	36.0%	10.0%	5.0%		78.57	
B3	As a student you are properly motivated for practical class.	High School	1.0%	4.0%	4.0%	24.0%	67.0%	4.44	106.22	.106
		Madrasah	0.0%	6.0%	8.0%	30.0%	56.0%		94.78	
B4	Teachers have sufficient skill for conducting practical class properly.	High School	0.0%	2.0%	5.0%	46.0%	47.0%	4.16	113.98	.000
		Madrasah	1.0%	7.0%	20.0%	42.0%	30.0%		87.02	
B5	The institute has available special facilities (Toilet, female common room, etc.)	High School	1.0%	4.0%	36.0%	15.0%	44.0%	3.70	113.22	.001
		Madrasah	4.0%	20.0%	32.0%	17.0%	27.0%		87.79	

Similarly, other statements of this block can be interpreted using a summarized format as illustrated in Table 4.15. For statement B2, it was observed that 49% High School students and 15% Madrasah students have opined in the category of agree and strongly agree, which implies 32% of total students were positive (agree/strongly agree) regarding the statement.

The responses were also in the category of 'Undecided' in terms of weighted average (WA= 2.99). Meanwhile, mean ranks of High School and Madrasah students were 122.44 and 78.57 respectively and their Sig. value was 0.00, which was less than .05 that implies the null hypothesis was rejected. So, there was a significant difference between High School and Madrasah students in terms of their responses to this statement. As the mean rank of Madrasah students was much lower than the High School students, it can be interpreted that there was not enough number of tools, machines and raw materials for practical job in Madrasah as compared to High School and more specifically, the margin of difference was very significant in this regard.

The statement B3 indicates that 91% High School students and 86% Madrasah students have opined in the category of agree and strongly agree, which implies most of the students (88.5%) were positive (agree/strongly agree) regarding the statement. The responses were also in the category of 'Agree' in terms of weighted average (WA= 4.44). Meanwhile, mean ranks of High School and Madrasah students were 106.22 and 94.78 respectively and their Sig. value was 0.106, which was greater than .05 that implies the null hypothesis was not rejected. So, there was no significant difference between High School and Madrasah students in terms of their responses to B3. As the responses of both High School and Madrasah students were highly positive and there was no significant difference between them, it can be interpreted that the students were highly motivated for their respective practical classes.

From table 4.35 it was observed that 93% High School students and 72% Madrasah students have opined in the category of agree and strongly agree on statement B4, which implies most of the students (82.5%) were positive (agree/strongly agree) regarding this statement. The responses were also in the category of 'Agree' in terms of weighted average (WA= 4.16). Meanwhile, mean ranks of High School and Madrasah students were 113.98 and 87.02 respectively and their Sig. value was 0.00, which was less than .05 that implies the null hypothesis was rejected. So, there was a significant difference between High School and Madrasah students in terms of their responses to this statement. As the responses of both High School and Madrasah students were positive, it can be interpreted that the students were positive regarding their teachers having sufficient skill for conducting practical class properly though opinion of High School students to this statement was better than those of Madrasah.

The statement B5 indicates that 59% High School students and 44% Madrasah students have opined in the category of agree and strongly agree, which implies only half of the students were positive (agree/strongly agree) regarding this statement. The responses were also in the category of 'Agree' in terms of weighted average (WA= 3.70). Meanwhile, mean ranks of High School and Madrasah students were 113.22 and 87.79 respectively and their Sig. value was 0.01, which was less than .05 that implies the null hypothesis was rejected. So, there was a significant difference between High School and Madrasah students in terms of their responses to this statement. As the responses of both High School and Madrasah students were just around 50%, it can be said that the students were neither positive nor negative regarding the special facilities at their institutes including toilet, female common room, etc. though opinion of High School students to this statement was better than those of Madrasah.

So, the overall analysis of students' responses to the statements related to subject matter (theory and practical) was in the category of 'Agree' as the overall weighted average was 3.64 [= (2.92+2.99+4.44+4.16+3.70)/5]. However, there was a significant difference between High School and Madrasah students in terms of adequacy in number labs (B1), adequacy of tools, machines and raw materials for practical jobs (B2), sufficient skill of teachers for conducting practical class properly (B4), and availability of special facilities including toilet and common room for female students (B5). More specifically, opinions of High School students were more positive than Madrasah students to these four statements B1, B2, B4 and B5 while no significant difference was observed between the two groups in case of B3.

4.2.3 Analysis of teachers' responses to the statement related to Institutional Facilities, Competency and Training Requirements

This block of statements is cross-checking of information gathered from the students with those of teachers, which in turn, serves as a triangulation of data. It entails teachers' responses on institutional facilities, competency and training requirements, which includes lab facilities, machine tools, raw materials, students' motivation and competency in trade and science subjects, skill-based training for teachers and opportunity to update skills. For the 1st statement (institute has adequate number of labs) of this block, category percentage, weighted average, mean rank and sig. value of MWW test was calculated in SPSS 20.

Table 4.16 Crosstabulation of the students' responses to statement C1

| | | C1. The institute has adequate number of labs. | | | | | Total |
		SD	D	U	A	SA	
High School	Count	2	1	4	10	1	18
	% within Institute	**11.1%**	**5.6%**	**22.2%**	**55.6%**	**5.6%**	100.0%
Madrasah	Count	3	4	4	1	0	12
	% within Institute	**25.0%**	**33.3%**	**33.3%**	**8.3%**	**0.0%**	100.0%
Total	Count	**5**	**5**	**8**	**11**	**1**	30

It was observed from table 4.46 that 61.2% High School teachers and 8.3% Madrasah teachers opined in the category of agree and strongly agree on statement C1, which implies only one third of the total teachers were positive (agree/strongly agree) regarding the statement. The responses were also in the category of 'Undecided' in terms of weighted average [WA= (1x5 + 2x5 + 3x8 + 4x11 + 5x1) / (5+5+8+11+1) = 88/30 = 2.93]. The scenario was presented in Figure 4.3.
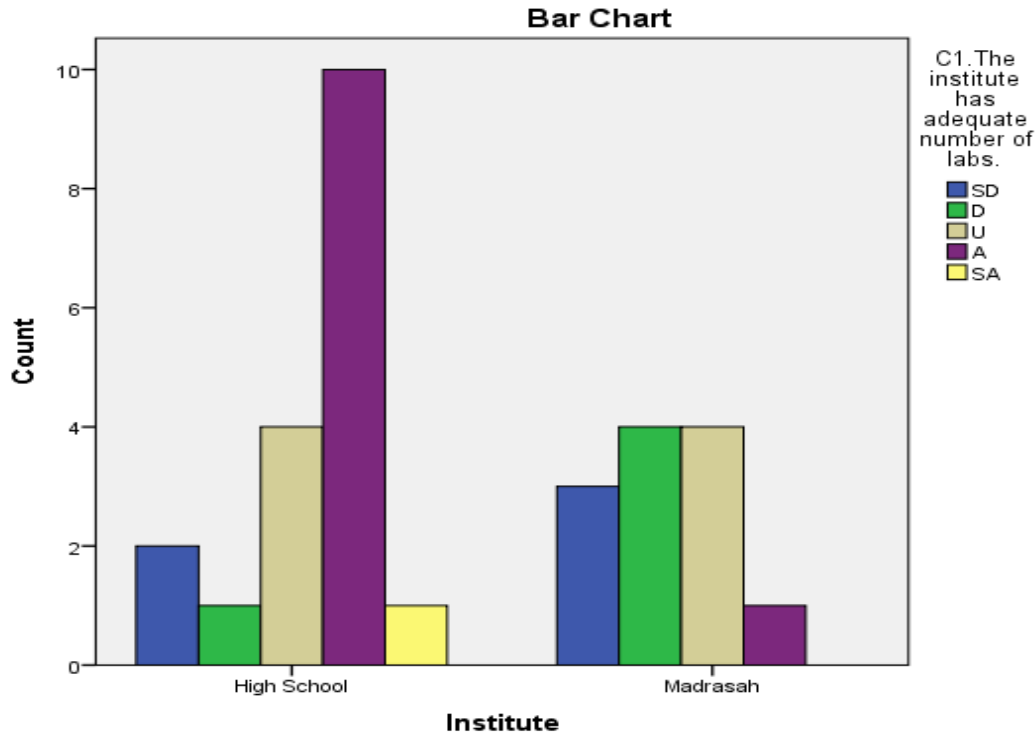

Figure 4.3 Bar chart of the teachers' responses to statement C1

Table 4.17 Mann-Whitney-Wilcoxon test of the teachers' responses to statement C1

Mann-Whitney-Wilcoxon Test						
	Institute	N	Mean Rank		Test Statistics[a]	
C1. The Institute has adequate number of labs	High School	18	19.00			C1. The Institute has adequate number of labs
	Madrasah	12	10.25		Mann-Whitney U	45.000
	Total	30			Asymp. Sig. (2-tailed)	.006
					a. Grouping Variable: Institute	

Meanwhile, mean ranks of High School and Madrasah teachers were 19.00 and 10.25 respectively and their Sig. value was 0.006 as illustrated in Table 4.17, which was less than .05 that implies the null hypothesis was rejected. So, there was a significant difference between High School and Madrasah teachers in terms of their responses to this statement. As the mean rank of Madrasah teachers was much lower than the High School teachers, it can be interpreted that there was inadequate number of labs in Madrasah as compared to High School and more specifically, the margin of difference was very significant in this regard. This was also evidenced in the relevant students' responses discussed earlier in this chapter.

Similarly, other statements of this block can be interpreted using a summarized format as illustrated in Table 4.18. For statement C2, it was observed that 72.2% High School teachers and only 8.3% Madrasah teachers have opined in the category of agree and strongly agree, which implies 40% of the total teachers were positive (agree/strongly agree) regarding the statement. The responses were also in the category of 'Undecided' in terms of weighted average (WA= 3.07). Meanwhile, mean ranks of High School and Madrasah teachers were 19.53 and 9.46 respectively and their Sig. value was 0.001, which was less than .05 that implies the null hypothesis was rejected. So, there was a significant difference between High School and Madrasah teachers in terms of their responses to this statement. As the mean rank of Madrasah teachers was much lower than the High School teachers, it can be interpreted that there was not enough number of tools, machines and raw materials for practical job in Madrasah as compared to High School and more specifically, the margin of difference was very significant in this regard, which was also evidenced in the relevant students' responses.

Table 4.18: Analysis of teachers' responses to the statement related to Institutional Facilities, Competency and Training Requirements

Sl.	STATEMENTS	STATUS	1(SD)	2(D)	3(U)	4(A)	5(SA)	WA	Mean Rank	MWW Sig.
C1	The institute has adequate number of labs.	High School	11.1%	5.6%	22.2%	55.6%	5.6%	2.9333	19.00	.006
		Madrasah	25.0%	33.3%	33.3%	8.3%	0.0%		10.25	
C2	The institute has sufficient tools, machines and raw materials for practical class.	High School	0.0%	22.2%	5.6%	61.1%	11.1%	3.0667	19.53	.001
		Madrasah	8.3%	66.7%	16.7%	8.3%	0.0%		9.46	
D1	Students are able to cope with complexity level of trade course.	High School	0.0%	5.6%	33.3%	38.9%	22.2%	3.1333	20.61	.000
		Madrasah	8.3%	66.7%	25.0%	0.0%	0.0%		7.83	
D2	Your students understand Math, Science subject	High School	5.6%	33.3%	11.1%	44.4%	5.6%	3.0667	15.89	.750
		Madrasah	0.0%	41.7%	16.7%	41.7%	0.0%		14.92	
D3	Students are properly motivated for practical classes.	High School	0.0%	11.1%	11.1%	44.4%	33.3%	4.0667	15.17	.784
		Madrasah	0.0%	0.0%	16.7%	50.0%	33.3%		16.00	
E1	You as a teacher need training to enhance your practical knowledge and skills.	High School	0.0%	0.0%	0.0%	38.9%	61.1%	4.6333	15.17	.761
		Madrasah	0.0%	0.0%	0.0%	33.3%	67.7%		16.00	
E2	As a teacher you have sufficient skill for taking practical class properly	High School	0.0%	0.0%	5.6%	72.2%	22.2%	4.0000	17.14	.146
		Madrasah	0.0%	8.3%	25.0%	50.0%	16.7%		13.04	

The statement D1 indicates that 61.1% High School teachers and no Madrasah teachers have opined in the category of agree and strongly agree, which implies about 30% of the teachers were positive (agree/strongly agree) regarding the statement. The responses were also in the category of 'Undecided' in terms of weighted average (WA= 3.13). Meanwhile, mean ranks

of High School and Madrasah teachers were 20.61 and 7.83 respectively and their Sig. value was 0.000, which was greater than .05 that implies the null hypothesis was rejected. So, there was a significant difference between High School and Madrasah teachers in terms of their responses to this statement. As the responses of only High School teachers were positive and there was a significant difference between them, it can be interpreted that High School students were far better in terms of their ability to cope with complexity level of trade course while Madrasah students were found highly negative to this statement.

From table 4.58 it was observed that 50% High School teachers and 41.7% Madrasah teachers have opined in the category of agree and strongly agree on statement D2, which implies most of the teachers (46%) were positive (agree/strongly agree) regarding this statement. The responses were also in the category of 'Agree' in terms of weighted average (WA= 3.07). Meanwhile, mean ranks of High School and Madrasah teachers were 15.89 and 14.92 respectively and their Sig. value was 0.750, which was greater than .05 that implies the null hypothesis was not rejected. So, there was no significant difference between High School and Madrasah teachers in terms of their responses to this statement. As the responses of both High School and Madrasah teachers were just less than 50% overall and there was no significant difference between them, it can be interpreted that the students' competency in understanding Math and Science subject was just average.

The statement D3 indicates that 77.7% High School teachers and 83.3% Madrasah teachers have opined in the category of agree and strongly agree, which implies most of the teachers were positive (agree/strongly agree) regarding this statement. The responses were also in the category of 'Agree' in terms of weighted average (WA= 4.07). Meanwhile, mean ranks of High School and Madrasah teachers were 15.17 and 16.00 respectively and their Sig. value was 0.784, which was greater than .05 that implies the null hypothesis was not rejected. So, there was no significant difference between High School and Madrasah teachers in terms of their responses to this statement. As the responses of both High School and Madrasah teachers were highly positive (80.5%) and there was no significant difference between them, it can be interpreted that teachers attributed their students as highly motivated for their practical classes. Same interpretation was also evidenced in case of students' responses.

The statement E1 indicates that 100% High School teachers and 100% Madrasah teachers have opined in the category of agree and strongly agree, which implies all the teachers were positive (agree/strongly agree) regarding this statement. The responses were also in the category of 'Strongly Agree' in terms of weighted average (WA= 4.63). Meanwhile, mean ranks of High School and Madrasah teachers were 15.17 and 16.00 respectively and their Sig. value was 0.761, which was greater than .05 that implies the null hypothesis was not rejected. So, there was no significant difference between High School and Madrasah teachers in terms of their responses to this statement. As the responses of both High School and Madrasah teachers were totally positive (100%) and there was no significant difference between them, it can be said that teachers have felt the need of training to enhance their practical knowledge/skills. This was in-line with the students' responses discussed earlier.

The statement E2 indicates that 94.4% High School teachers and 66.7% Madrasah teachers have opined in the category of agree and strongly agree, which implies most of the teachers were positive (agree/strongly agree) regarding this statement. The responses were also in the category of 'Agree' in terms of weighted average (WA= 4.00). Meanwhile, mean ranks of High School and Madrasah teachers were 17.14 and 13.04 respectively and their Sig. value was 0.146, which was greater than .05 that implies the null hypothesis was not rejected. So, there was no significant difference between High School and Madrasah teachers in terms of their responses to this statement. As the responses of both High School and Madrasah teachers were highly positive (80.5%) and there was no significant difference between them, it can be interpreted that teachers have sufficient skill for taking practical class properly. This was to some extent contradiction of the teachers' responses to statement E1.

So, the overall analysis of teachers' responses to the statements related to institutional facilities, competency and training requirements was in the category of 'Agree' as the overall weighted average was 3.55. However, there was a significant difference between High School and Madrasah teachers in terms of adequacy in number labs (C1), adequacy of tools, machines and raw materials for practical jobs (C2), and coping with complexity level of trade courses (D1). More specifically, opinions of High School teachers were more positive than Madrasah teachers to these statements C1, C2, and D1 while no significant difference was observed between the two groups in case of statement D2, D3, E1 and E2.

4.2.4 Comparative analysis with respect to data collected Institutional information

1. SSC (Voc.) program started in period of 2000 to 2003, whereas most of the Dakhil (Voc.) program started from 2003 to 2011 in our collected sampling institute.

Table 4.19: Trade, number seats and no. of students available in School:

Name of the Trades	Seat capacity	Present student	Male students	Female students
Computer & Information technology	30	28	21	07
Dressmaking	150	105	21	84
General Electrical works	180	159	141	18
Total	360	292	183	109

Number of seats filled by present student $= \frac{292}{360} \times 100 = 81.11\%$

Number of seats filled by male students $= \frac{183}{292} \times 100 = 62.63\%$

Number of seats filled by female students $= (100\text{-}62.63) = 33.37\%$

Table 4.20: Trade, number seats and no. of students available in Madrasah:

Name of the Trades	Seat capacity	Present student	Male students	Female students
Computer & Information technology	180	133	105	28
Dressmaking	90	68	40	28
General Electrical works	150	117	116	01
Total	420	318	261	57

Number of seats filled by present Dakhil (Voc.) students $= \frac{318}{420} \times 100 = 75.71\%$

Number of seats filled by male students $= \frac{261}{318} \times 100 = 82\%$

Number of seats filled by female students $= (100\text{-}18) = 18\%$

From the above data analysis in High School it was observed that 81% seat filled by the students with respect to available seat capacity whereas Madrasah cases 75% seat were filled by the students. In the School, 62.63% male students were studying with respect to total number of admitted students; in Madrasah 82% male students were studying with respect to

total number of admitted students. There were very less number of female students admitted in Dakhil (Voc.) like 18% but in the School cases, it was above 33% in the SSC (Voc.).

Physical resources:

In Schools: (i) number of science labs: 05 out of 05 institutes, (ii) number of trade labs: 11 labs were available out of 12 trades slot, (iii) library: 05 out of 05 institutes, (iv) female common room: 04 out of 05 institutes.

In Madrasahs: (i) number of science labs: 04 out of 07 institutes, (ii) number of trade labs: 08 labs were available out of 16 trades slot, (iii) library: 05 out of 07 institutes, (iv) female common room: 05 out of 07 institutes

From the above information it was observed that SSC (Voc.) High School student heaving more lab and relative other facilities than Dakhil (Voc.) Madrasah students

Human resources:

In schools:

i) General related subject teacher: a) Number of post available: 15

b) Present filled post: 09   c) Male teacher: 08   c) Female teacher: 01

ii) Number of trade teachers: a) Number of post available: 24

b) Present filled post: 22   c) Male teacher: 16   d) Female teacher: 06

Number of Trade teacher post filled in High School $= \frac{22}{24} \times 100 = 92.67\%$

In Madrasahs:

i) General related subject teacher: a) Number of post available: 28

b) Present filled post: 25   c) Male teachers: 18   c) Female teachers: 07

ii) Number of trade teachers: a) Number of post available: 32

b) Present filled post: 15   c) Male teachers: 10   d) Female teachers: 05

Number of Trade teacher post filled in Madrasahs $= \frac{15}{32} \times 100 = 48\%$

From the above calculation, it was clear that Dakhil (Voc.) Madrasahs had shortage of technical persons (only 48%) which had critical impact on students training, whereas SSC (Voc.) in High School, 92% technical teacher posts were filled. Therefore, it can be assumed that students were getting more technical training.

Table 4.21: Employment status of graduate in the SSC (Voc.) (approximate percentage (%)

H.S.C (Voc.)	H.S.C (General)	Polytechnic/ other diploma	Entered into the job	Drop out
10	20	40	5	25
5	20	60	10	5
40	5	40	10	5
15	40	30	5	10
= 17%	= 21%	= 43%	= 8%	= 11%

Table 4.22 Employment status of graduate in the Dakhil (Voc.) (approximate percentage (%).

H.S.C (Voc.)	H.S.C (General)	Polytechnic/ other diploma	Entered into the job	Drop out
15	10	40	10	25
10	20	10	40	20
30	5	20	40	5
10	10	40	30	10
40	15	40	_	5
= 21%	= 12%	= 30%	= 24%	= 13%

From the above two table it was observed that approximately 43% SSC (Voc.) and 30% Dakhil (Voc.) students admitted into polytechnic/others diploma programs. Dakhil (Voc.) 37% students entered into job or dropped out but in SSC (Voc.) this incident happened in only 19% students cases. SSC (Voc.) 17% students admitted into H.S.C (Voc.) but Dakhil (Voc.) it happened only for 21% cases. SSC (Voc.) 21% students admitted for general education, whereas only 12% Dakhil (Voc.) admitted for general education.

CHAPTER V
DISCUSSIONS AND CONCLUSIONS

5.1 Summary

The purpose of the study was to compare student performance of S.S.C (Voc.) and Dakhil (Voc.) in Bangladesh. The study was carried out on the basis of the following objectives:

- investigate any difference in academic performance of male students between High School and Madrasah education;
- investigate any difference in academic performance of female students between High Schools and Madrasahs;
- find out any difference in academic performance between male and female students in S.S.C (Voc.) of High Schools;
- find out any difference in academic performance between male and female students in Dakhil (Voc.) of Madrasahs.
- identify the impact of integrated curriculum and environmental factors experienced by SSC (Voc.) and Dakhil (Voc.) students.

The pupolation target was the students of SSC(Voc.) in High School and Dakhil (Voc.) in Madrasah of Bangladesh who were graduated in 2017 and currently studing in class X in their respectve institutes. Students were chosen from General Electrical works, Dressmaking and Computer trade. Both male and female students were considered. In Bangladesh there are 2560 High schools and Madrasahs as BTEB affiliated institutes operating SSC (Voc.) and Dakhil (Voc.) certificate level program. However, the study was delimited to five High schools and seven Madrasahs for the convenience of data collection of this study. A mimeograph was designed to collect the students results from BTEB for SSC (Voc.) and Dakhil (Voc.) public examination results. The total sample size according to the data collected totaled up to 401 graduated students. Their CGPA were tabulated and then analyzed in SPSS. Another 200 regular students and 30 teachers were selected for data collection using Likert 5-point scale and corresponding analysis in SPSS 20.0.

As a part of the study CGPA was collected from BTEB website and male-female students were indicated by the respective institutes. Out of thirteen institutes researcher went to nine institutes by himself. Data from another four institutes was collected through request letter to individual polytechnic colleagues personally. Out of 200 statement-wise questionnaires, all of them had been collected and received; therefore, return rate was 100%. From the collected copy of the questionnaires the returned data were tabulated and analyzed using SPSS software. To compare the students academic performance, two-samples t-test was designed. For the statement wise opinion, responses were on five-point rating scale i.e. strongly agree to strongly disagree. Category percentage, weighted average and Mann-Whitney-Wilcoxon (MWW) test (instead of chi-square test) were conducted on the responses of each statement of the questionnaire to check whether responses on the statement varies between groups or not. All the separate tables and graphs have been automatically generated by the different statements of the questionnaire during data analysis. Based on the overall analysis, a set of recommendations were proposed for the relevant bodies for decision making.

5.2 Findings

Objective I: The results from the analysis shown that the academic performance of male students between High Schools and Madrasahs was not significantly different at 0.05 significance level but it was found that the mean value of CGPA obtained by the High School students was higher than those of Madrasah students.

Objective II: Academic performance of female students between High Schools and Madrasahs was not significantly different but it was found that the mean value of CGPA obtained by the High School female students was higher than those of Madrasah female students.

Objective III: There is a significant difference in academic performance of High School students between male and female in the respective cases at 0.05 significance level and it was found that the mean value of CGPA obtained by female students was higher than those of male students.

Objective IV: Academic performance of male and female students of Madrasahs was not significantly different but it was found that the mean value of CGPA obtained by female students were higher than those of male students.

It was observed from the above discussion that three out of four cases, there was no significant difference between the groups in terms of academic performance. These groups include male students' academic performance between High School and Madrasah Education, female students' academic performance between High School and Madrasah Education, and Madrasah students' academic performance between Male and Female. However, a significant difference was observed in the academic performance of High School students between male and female.

Objective V: The research result also presents a range of curriculum (subject) issues and institutional environmental problems faced by the students and also experienced by their teachers, which had vital impacts on academic performance.

Students' responses to the statement(s) of the questionnaire:

Statement A1: It was observed that 69% High School students and 66% Madrasah students, overall 67.5% students opined in the category of agree and strongly agree on statement A1, which implies most of the students were positive (agree/strongly agree) regarding the statement. Regarding the subject matter understanding of students, majority of them agreed that they were not facing difficulties to understand mathematics subject during their study.

Statement A2: It was observed that 51% High Schools and 59% Madrasah students, overall 55.0% students were positive (agree/strongly agree) on their responses. It implies that there was no significant difference between them, it can be interpreted that the students' competency of having full confidence/ understanding in Science (Physics, Chemistry) was average or somehow good.

Statement A3: There were 39% High School students and 47% Madrasah students total approximately two-fifth of the students (43%) were positive (agree/strongly agree) regarding the statement. The responses were also in the category of 'Undecided' in terms of weighted

average (WA= 3.38) and their Sig. value was 0.418, which is greater than .05 that implies the null hypothesis was not rejected. So, there was no significant difference between High School and Madrasah students in terms of their responses to this statement. As the responses of both groups were less than 50% and there is no significant difference between them, it was seen that most of the students were not confident in their English language proficiency but they did not also disagree about this statement and its significance.

Statement A4: It was observed that 80% High School students and 53% Madrasah students opined in the category of agree and strongly agree on statement and mean ranks of High School and Madrasah students were 119.70 and 81.31 respectively and their Sig. value was 0.00, which implies a significant difference between High School and Madrasah students in terms of their responses to this statement. It can be generalized that Madrasah students did not feel as competent as High School students in their trade subjects and more specifically, the margin of difference was significant in this regard.

Statement A5: It was indicated that 90% High School students and 56% Madrasah students opined in the category of agree and strongly agree. So, there was a significant difference between High School and Madrasah students in terms of their responses to this statement. The mean rank of Madrasah students was much lower than the High School students. Most of the SSC (Voc.) students were agreed that they had more chance to practical job by his own hand and practical works were easy but Dakhil (Voc.) students' views that they had less opportunity for this aspect as compared to SSC (Voc.) students.

Statement A6: It indicates that 84% High School students and 47% Madrasah students opined in the category of agree and strongly agree. High School and Madrasah students mean rank were 121.94 and 79.07 respectively and their Sig. value was 0.00, which was less than .05 that implies the null hypothesis was rejected. So, there was a significant difference between High School and Madrasah students in terms of their responses to this statement. In this regard, it can be interpreted that Madrasah students were less supportive to the statement of doing practical work by themselves than High School students and the margin of difference was significant in this regard.

Statement B1: From this statement, it was observed that 42% High School students and 8% Madrasah students opined in the category of agree and strongly agree and mean ranks of High School and Madrasah students were 128.79 and 72.21 respectively and their Sig. value was 0.00, which is less than .05 that implies the null hypothesis was rejected. So, there was a significant difference between High School and Madrasah students in terms of their responses to this statement. it is interpreted that there was inadequate number of labs in Madrasah as compared to High School and more specifically, the margin of difference was very significant in this regard.

Statement B2: It indicates that 49% High School students and 15% Madrasah students, overall 32% opined in the category of agree and strongly agree, and weighted average were in the category of 'Undecided' (WA= 2.99). Both the cases, most of students disagreed about their enough tools, machine and row materials facilities. As the mean rank was low for Madrasah students, so they were having fewer facilities than the High School students.

Statement B3: It indicates that 91% High School students and 86% Madrasah students opined in the category of agree and strongly agree, which implies most of the students (88.5%) were positive (agree/strongly agree) regarding the statement. As the responses of both High School and Madrasah students were highly positive and there was no significant difference between them, it can be interpreted that the students were highly motivated for their respective practical classes.

From statement B4 it was observed that 93% High School students and 72% Madrasah students opined in the category of agree and strongly agree, which implies that most of the responses of both High School and Madrasah students were positive, it can be interpreted that the students were positive regarding their teachers having sufficient skill for conducting practical class properly though perception of High School students to this statement was better than those of Madrasah.

Statement B5: As the responses of both High School and Madrasah students are just around 50%, it can be interpreted that the students are neither positive nor negative regarding the special facilities at their institutes including toilet, female common room, etc. but it was

observed that SSC (Voc.) institute having more special facilities than the Dakhil (Voc.) institutes considered in this study.

Teachers' responses to the statement(s) of the questionnaire

Statement C1: 61.2% High School teachers and 8.3% Madrasah teachers opined in the category of agree and strongly agree on statement. There was a significant difference between High School and Madrasah teachers in terms of their responses to this statement. As the mean rank of Madrasah teachers was much lower than the High School teachers, it can be interpreted that there was inadequate number of labs in Madrasah as compared to High School and more specifically, the margin of difference was very significant in this regard. Similar type of result was also found in the student responses.

Statement C2: The mean rank of Madrasah teachers' opinion was much lower than the High School teachers, it can be interpreted that there was not enough number of tools, machines and raw materials for practical job in Madrasah as compared to High School and more specifically, the margin of difference was very significant in this regard, which was also evidenced in the relevant students' responses.

Statement D1: The statement indicates that 61.1% High School teachers and no Madrasah teachers opined in the category of agree and strongly agree. There was a significant difference between High School and Madrasah teachers in terms of their responses to this statement. As the responses of only High School teachers were positive and there it can be interpreted that High School students were far better in terms of their ability to cope with complexity level of trade course while Madrasah students were found highly negative to this statement.

Statement D2: 50% High School teachers and 41.7% Madrasah teachers opined in the category of agree and strongly agree on understanding Math and Science subject. The weighted average was 3.07 and their Sig. value 0.750, so there was no significant difference between High School and Madrasah teachers in terms of their responses to this statement. As the responses of both High School and Madrasah teachers were just less than 50% overall

and there was no significant difference between them, it can be interpreted that the students' competency in understanding Math and Science subject was just average.

The statement D3 indicates that 77.7% High School teachers and 83.3% Madrasah teachers opined in the category of agree and strongly agree, which implies most of the teachers were positive (agree/strongly agree) regarding this statement. The weighted average of the responses was 4.07, Sig. value 0.784, so there was no significant difference between High School and Madrasah teachers in terms of their responses to this statement. As the responses of both High School and Madrasah teachers were highly positive (80.5%) and teachers attributed their students as highly motivated for their respective practical classes. Same interpretation was also evidenced in case of students' responses.

The statement E1 indicates that 100% High School teachers and 100% Madrasah teachers opined in the category of agree and strongly agree on their responses to this statement. As the responses of both High School and Madrasah teachers were totally positive (100%) and there was no significant difference between them, it can be interpreted that teachers felt the need of training to enhance their practical knowledge/skills. This was in-line with the students' responses discussed earlier in this chapter.

The statement E2 indicates that 94.4% High School teachers and 66.7% Madrasah teachers opined in the category of agree and strongly agree, about their sufficient skill of taking practical class. As the responses of both High School and Madrasah teachers were highly positive (80.5%) and there was no significant difference between them, but it was contradictory with their previous statement E1 to some extent.

Some of the institutional findings:
At present 81.11% seat were filled in 2016-17 session in High school whereas 75.71% seats were filled in Madrasah. Only 33.37% female students were admitted in the same academic year in High School, which was further low at Madrasah (only 18%). Similar situation was also observed in case of teachers. 92.67% trade teacher posts were filled in High School whereas Madrasah teachers post filled only by 48%.

5.3 Conclusions

On the basis of the findings the following conclusions were drawn:

- There was no significant difference in academic performance of male students between High School and Madrasah in the respective cases.
- There was no significant difference in academic performance of female students between High School and Madrasah in the respective cases.
- There was a significant difference in academic performance of High School students between Male and Female. It was observed that female students were higher achiever in academic perfomance than the male students.
- There was no significant difference in academic performance of male and female students in Madrasah in the respective cases.

From the analysis of the statements relating to objective 5 of the study, shortage of teachers, lack of labs, instrument and raw materials, and accessibility of equipment's were evidenced in this study, which are considered critical components for vocational skill integration in Bangladesh. For effective development of students' competency and teachers' professional development, sufficient labs and equipment, proper training and technical support need to be provided to the teachers. Government support is also required to the technical institutions in order run SSC (Voc.) and Dakhil (Voc.) programs effectively in the High schools and Madrasahs respectively. After a long consideration of the student's performances in both SSC (Voc.) and Dakhil (Voc.) programs, that it was realized that students' overall performance could be better if they have been provided required resources and expert manpower. However, majority of the students' academic performances were adversely affected due to the poor academic environment at their respective institution, which includes but not limited to availability of lab facility, machines, equipment and raw materials. The researcher carefully observed that most of the non-MPO and trade instructors of Dakhil (Voc.) Madrasah were not available at their institutes. Some cases it was seen that teachers who had been taking their technical classes, were actually appointed for the general Madrasah section. Therefore, qualified teachers need to be recruited for operating technical courses of the SSC (Voc.) and Dakhil (Voc.) programs, particularly in Madrasah vocational programs.

5.4 Recommendations and Further Study

This study investigated student performance of SSC (Voc.) and Dakhil (Voc.) programs. However, due to time and resource constraints General Electrical works, Dressmaking, and Computer trades of only five High school for SSC (Voc.) and seven Madrasah for Dakhil (Voc.) were considered as sample. It would be better if the number of institution could be increased including more trades in order to generalize the results. Other observations are:

1. From the data collection percentage, it was unfortunately observed that male and female enrolment in secondary schools was in favor of male students. In this regard, there should be public campaign by the government, local public representative and respective institutes to address the issue on the need for gender equality and equity in both SSC (Voc.) schools and Dakhil (Voc.) Madrasahs in terms of enrollment.

2. Teachers and the relevant authorities should find a means to motivate and counsel students, particularly male on the need to have better knowledge and skills in SSC (Voc.) and Dakhil (Voc.) examination. It is to be noted that male students received less CGPA in the recently published results as compared to the female student community.

3. Government and its relevant Ministries should organize capacity building projects, training and workshops periodically in the area of teaching with particular emphasis on technical know-hows of different trades as per need of the local and international job sectors.

4. Furthermore, students' performance depends on many factors such as students' prior-knowledge, teaching-learning environment, quality of teachers, etc. It is often reported that most of the Dakhil (Voc.) institutions are non-MPO (BTEB website, 2017) or the private-run institutions have relatively inferior classroom and lab set-up as well as less experienced and pedagogically not-trained teachers. The Government and respective authority should improve these situations by implementing and practicing relevant policies.

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APPENDIX

QUESTIONNAIRE

Institutional information

1. Name of Institution: …………………………………………………………………..
2. Contact details:

   Location of Institute: Division: ……………….. District: ………………………..

   Upazila: ………………… Post Office: ………………………………………….

   Mobile number of Head of Institute: ………………………………………………..

   Mail address of Institute: ………………………………………….. ………….

3. Starting year of SSC/Dakhil (vocational) program: ………………………………..

4 . Trades and no. of students:

Name of the Trades	Seat capacity	Present student	Male students	Female students

5. Physical resources:

i) Number of science labs: ....……… ii) Number of Trade labs: ……..………….

iii) Library: …………………iv) Female common room: ……………………….

6. Human resources:

i) General related subject teacher: a) Number of post available ………………….

b) Present filled post: ………… c) Male teacher: ……….. c) Female teacher: ………

ii) Number of trade teachers: a) Number of post available ……..………..

b) Present filled post: ……… c) Male teacher: ……….. d) Female teacher: ……….…..

iii) Teacher's experience: a) below 2 years: ..……… b) 2 to5 years: …………

c) Above 5 to 10 years ……… d) Above 10 years: ……….…..

7. Others information:

 i) Do you have job placement/ carrier guidance center with liaison officer/industry-institution coordinator? If yes then please mention full time / part time.

ii) Employment status of your graduate (please give the exact number and percentage (%):

a) H.S.C (Voc.)……..….. b) H.S.C (General) ..……... c) Polytechnic/other diploma

…………. d) Entered into the job: ……………..   e) Drop out: …………

QUESTIONNAIRE

Teacher information

1. Name of teacher (Trade teacher) …………………………………………………..
2. Contact details:
a) Designation: ☐Head of Department ☐ Instructor/Trade Instructor

   b) Age: …………… c) Mobile: …………………………

:d) Email address:……………………………   e) Gender:☐Male ☐Female
3. How long you have been working for teaching: ....
4. Industry/others job experience (in years): …………………
5. Educational background: ……………………………………………………….…
6. Teaching load per week: i) …………………………..… ii) Practical: ………………
7. Do you practice any others job/service: No……..

Statement related to the environment:

Kindly complete this questionnaire by ticking (√) the appropriate option that reflects your

opinion using the following scale:

[5] Strongly agree [4] Agree [3] Undecided [2] Disagree [1] strongly disagree

SL. No	Statements	Response				
		SA(5)	A(4)	U(3)	D(2)	SD(1)
1	The institute has adequate number of labs.					
2	The institute has sufficient tools, machines and raw materials for practical job.					
3	Students are able to cope with complexity level of Trade course.					
4	Your students understands Math, Science subject					
5	Students are properly motivated for practical classes.					
6	You need training to enhance your practical knowledge and skills.					
7	As a teacher you have sufficient skill for taking practical class properly.					

Please write your opinion about area of physical, human and other resources and also socio-political condition or common problem of your institute (if any).

……………………………………………………………………………………………
……………………………………………………………………………………………
……………………………………………………………………………………………

<h1 align="center">Questionnaire for Students</h1>

Students background: a) Name of student (optional): ………………………………

b) Roll no: ……………… c) Mobile: …………………… ………………………….

d) Date of birth/Age: ……………… e) ☐ Graduate student ☐ Regular student

f) Gender: ☐ Male ☐ Female g) Department/Trade: ………………,

level: ……………..………………….. h) GPA

of class IX: …………… CGPA of class X: ……………………………

i) Father Occupation: ……….……. Mother occupation: ……………………..

Statement related to the subject:

Please complete this questionnaire by ticking (√) the appropriate option that reflects your opinion using the following scale:

[5] Strongly agree [4] Agree [3] Undecided [2] Disagree [1] Strongly disagree

A.Statement related to subject and practical based

SL No.	Statements	Response				
		SA(5)	A(4)	U(3)	D(2)	SD(1)
1	You have full confidence/understanding in Mathematics					
2	You have full confidence/understanding in Science (Physics, Chemistry)					
3	You confident in your English language proficiency					
4	You feel you are competent in your Trade subject					
5	Practical works are very much easy					
6	You do practical work by yourself					

B. **Statement related to Class room/Lab situation based:**

Please complete this questionnaire by ticking (√) the appropriate option that reflects your opinion using the following scale:

SL. No	Statements	Response				
		SA(5)	A(4)	U(3)	D(2)	SD()
1	The institute has adequate number of labs.					
2	The institute has sufficient tools, machines and row materials for practical job.					

3	As a student you are properly motivated for practical class.					
4	Teachers have sufficient skill for conducting practical class properly.					
5	The institute has available special facilities (Toilet, female common etc.)					

Please write your opinion about physical facilities or common problem of your institute or other issues (if any …………………………………………………….................................

…………………………………………………………………………………………...............