

Report No. AUS0000063

EMPLOYABILITY OF POST-SECONDARY TVET IN BANGLADESH

Tracking Survey of Graduates of Polytechnics



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EMPLOYABILITY OF POST-SECONDARY TVET IN BANGLADESH

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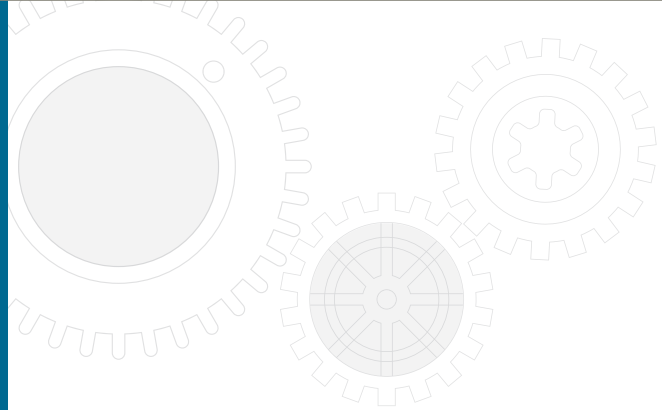
ACRONYMS AND ABBREVIATIONS

BANBEIS	Bangladesh Bureau of Educational Information and Statistics	NTVQF	National Technical and Vocational Qualification Framework
BBS	Bangladesh Bureau of Statistics	OECD	Organization for Economic Co-operation and Development
BDT	Bangladeshi Taka	OJT	On-the-Job Training
BTEB	Bangladesh Technical Education Board	PMT	Proxy Means Testing
CAPI	Computer Assisted Personal Interview	PPS	Probability Proportionate to Size
CGPA	Cumulative Grade Point Average	PSU	Primary Sampling Unit
DTE	Directorate of Technical Education	RAC	Refrigerator and Air Conditioning
FY	Fiscal Year	RMG	Ready Made Garment
GPA	Grade Point Average	RPL	Recognition of Prior Learning
GPI	Gender Parity Index	SSC	Secondary School Certificate
HSC	Higher Secondary Certificate	SSC (Voc)	Secondary School Certificate (Vocational)
ICT	Information and Communication Technology	SSU	Secondary Sampling Unit
ISC	Industry Skills Council	STEP	Skills and Training Enhancement Project
JSC	Junior Secondary Certificate	TTTC	Technical Teacher Training College
LFP	Labor Force Participation	TTTI	Technical Teacher Training Institute
MoE	Ministry of Education	TVET	Technical and Vocational Education and Training
NEP	National Education Policy	USD	United States Dollars
NGO	Non-Governmental Organization		
NSDC	National Skills Development Council		



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EXECUTIVE SUMMARY

SKILLS DEVELOPMENT IN BANGLADESH

1. Bangladesh is a country with a large youthful population and rapidly growing labor market; and the economic growth has been transforming Bangladesh's labor market structure. Out of its estimated 154 million people, around 40 percent are below 20 years of age. The demographic trend is offering the country an once-in-a-lifetime opportunity to reap the benefit of what is known as demographic dividend, a period in which the working-age population will have a low proportion of dependent young and old people, and be in a better position to enjoy the benefit of healthy economic and social development. The country has achieved a tremendous economic growth and made a huge stride in poverty reduction over the past few decades. The agriculture sector still absorbs the largest chunk of workers. Nevertheless, the past decade has witnessed dramatic shifts in the labor market with an increasing share of labor force employed in industry and service sectors. Every year more jobs are being created in the manufacturing sector. The share of persons employed in the manufacturing industry has grown from 11 percent in 2005 to 16 percent in 2013. Those jobs in the industry and service sectors tend to call for more educated workers.

2. The Government of Bangladesh has made skills development one of the national priorities; and the past decade witnessed an astonishing pace of expansion of the formal technical and vocational education system. The Seventh Five-Year Plan FY2016-FY2020 places an emphasis on expanding the human capital base to respond to the anticipated labor market needs generated by a growing and changing economy. The National Education Policy (NEP) 2010 formulated by the Ministry of Education (MoE) also places an emphasis on technical and vocational education and training (TVET) to facilitate productivity growth and self-employment. Based on the NEP, MoE set out a National Skills Development Policy 2011 as an overall guiding framework for the skills development sector in Bangladesh. From 2009 to 2015, the total enrollment in formal skills training institutions nearly doubled from just around 475,800 to 872,700 today. Females are increasingly seeking for skills development opportunities to find better employment and earn better incomes.

3. To enhance the access, equity, and quality of the skills development trainings in the country, the Government of Bangladesh (GoB) launched the Skills and Technical Enhancement Project (STEP) in 2010 funded by the GoB, World Bank, and the Government of Canada with the expected closing date of June 30, 2019. This study was commissioned as part of the research activities of the STEP project to inform the stakeholders and decision-makers of the skills development sector. Prior to this research, there had been no systematic studies done in Bangladesh to investigate the employment outcomes and economic situation of polytechnic graduates. This study aims at filling this critical knowledge gap and providing a much-needed evidence base for the future discourse towards improvement of the quality of TVET in Bangladesh.

4. The primary objective of this tracer study was to assess: (1) the employment outcomes and wages of polytechnic graduates and factors affecting them; (2) polytechnic institutions' capacity for training, industry linkage, and job placement; (3) expectations and perception of employers about polytechnic education and graduates; and (4) characteristics of polytechnic students, and motivation for and perception about training in polytechnics. Finally, the report will present recommendations to improve the quality and relevance of polytechnic education in Bangladesh. The study is intended to offer an useful evidence base for policy dialogue and further analysis for a wide range of stakeholders in skills development in and out of Bangladesh, including policy makers, relevant officials, TVET practitioners, and development partners of skills development.

5. This study conducted an extensive field survey to gather information from the main stakeholders of the polytechnic system in Bangladesh. The survey targeted four respondent groups to capture the relevant information more holistically from different viewpoints of different stakeholders. The four respondent groups are: (1) graduates who graduated from polytechnics one or two years ago; (2) students who are currently studying at the fourth year in polytechnics; (3) polytechnics, represented by principals; and (4) employers of polytechnic graduates.

6. The samples of graduates and students were randomly selected to be representative of all 92 STEP supported polytechnics, which cover 63 percent of the entire polytechnic student population, and include 2,000 graduates (of whom 11 percent are female) and 1,000 current students (of whom 16 percent are female). The majority of sampled graduates and students are young, respectively aged 23 years and 20 years or below. Also, the majority – around 60 percent of sampled graduates and students – are originally coming from rural areas.

KEY FINDINGS OF THE STUDY

Background of Polytechnic Students

7. Polytechnics, especially public polytechnics, are attracting academically strong secondary education graduates. Around 70 percent of polytechnic students completed their SSC with at least GPA-A (equivalent to at least 70 percent marks), which can be considered as good academic performance. The share of those who obtained the highest grade (GPA-A+) is around 12 percent. These shares compare quite favorably with the national average. Country-wide in 2012¹, only seven percent and 26 percent of the students who sat for the SSC national examination obtained GPA-A+ and GPA-A scores, respectively. It appears that most of the polytechnic students are academically sound students who put in satisfactory performance in secondary education. There are no significant differences across gender. Male and female polytechnic students appear to have similar academic records of the SSC exam. There is, however, a distinctive gap between students in public and private polytechnics with regard to academic performance at the point of entry. Public polytechnic students are generally higher achievers compared to those enrolled in private ones. Around 96 percent of students in public polytechnics had achieved at least GPA-A in their SSC terminal examination while the figure drops to only 36 percent for those in private polytechnics.

¹ These students under study joined polytechnics in 2012.

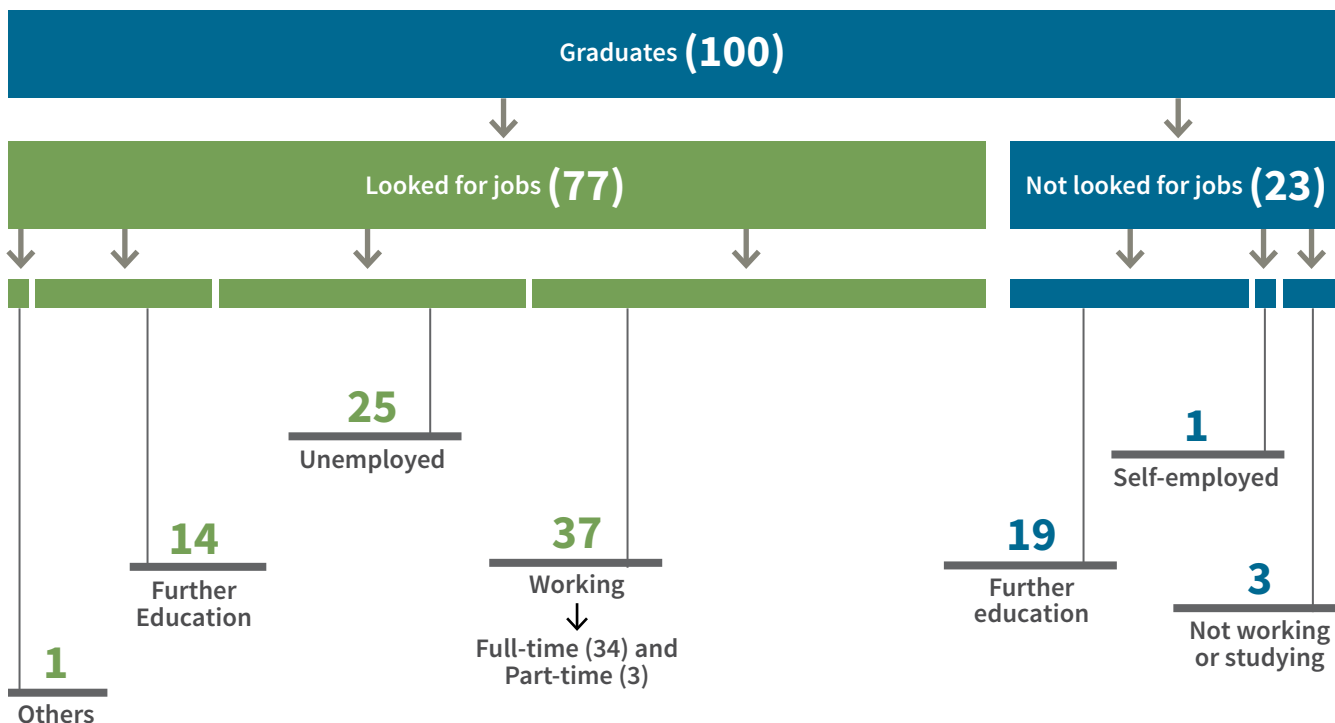
8. Access to polytechnic education seems relatively equitable; the majority of polytechnic students are coming from rural areas and humble family background.

It is found that around 67 of polytechnic students are coming from families living in rural areas. The share of students of rural origin is even higher for males as 71 percent of them are from rural families. In terms of family background, around 44 percent and 58 percent of fathers and mothers of polytechnic students, respectively, have only primary education qualification or less, while 36 percent of fathers and mothers have up to JSC or SSC qualification. Only about seven percent of fathers and one percent of mothers hold a bachelor degree or higher. With respect to parents' occupation, it is found that around 47 percent of fathers are working in agricultural, forestry and fishery sectors. Less than 20 percent of students have parents who are working as professionals or managers. It is evident that many of polytechnic students are coming from less privileged families with limited exposure to formal education. This indicates that polytechnics present rural families and not-so-well-off families with a more realistic and fair chance to post-secondary education and training for their children, unlike universities and colleges to which access is more competitive and often harder to be attained for rural families.

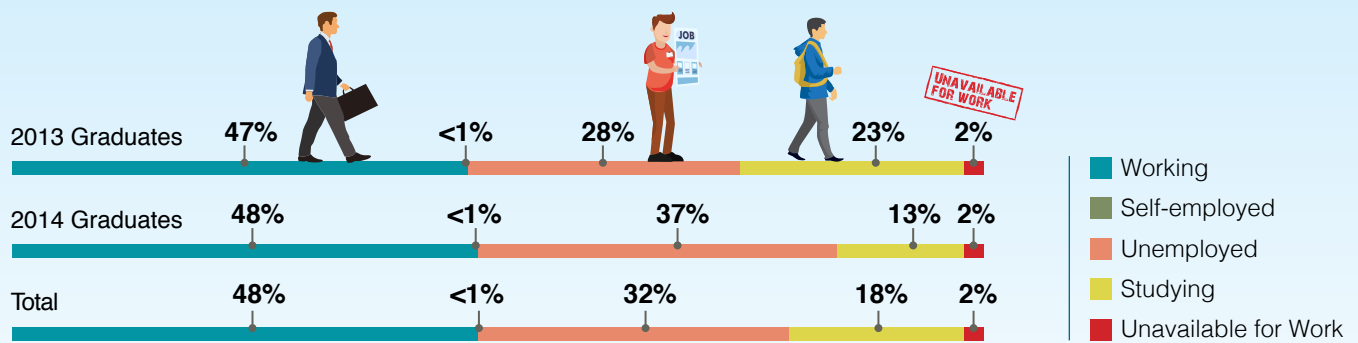
Employment Outcomes

9. Overall, polytechnic graduates are found to be employed (37%), unemployed (25%), or still in education and training (33%) after one or two years of graduation. The shares of those who are self-employed (1%) and not in the labor force nor study (3%) are rare. The survey reveals that there are three major economic outcomes for polytechnic graduates, which are: (i) employed full-time or part-time, (ii) unemployed, or (iii) studying full-time for further education and training. Overall distribution of graduates' employment outcomes is summarized in the figure below. Around 37 percent of all the graduates are employed within one or two years of graduation, while 25 percent are still unemployed. A substantial proportion (33 percent) are still studying full-time. Very few (only five percent) are neither in training nor in the labor market – the status which include, for instance, being full-time housewives or incapable to work for health reasons. Self-employment is also a rare job outcome for polytechnic graduates with only one percent being in self-employed businesses. Most of those who did not look for jobs moved on to further education and training. The subsequent sub-chapters will examine each economic outcome separately.

Figure 1: Overview of Current Status of Polytechnic Graduates



Source: Polytechnic Tracer Study 2016
 Note: The numbers in brackets show percentage shares against the entire graduate population

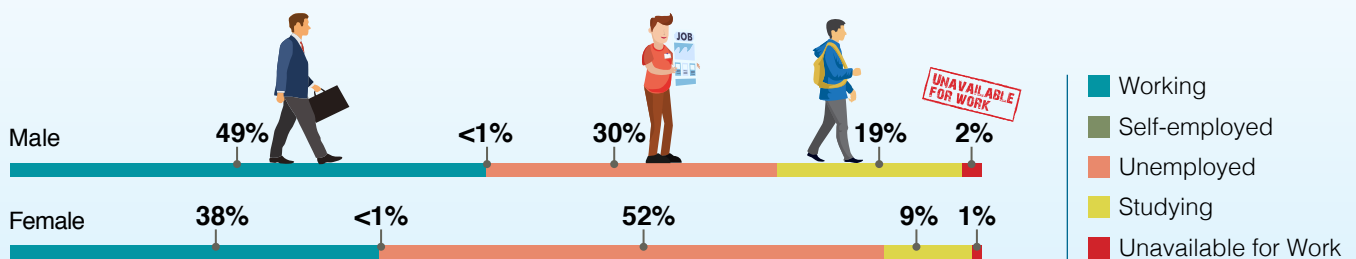


Source: Polytechnic Tracer Study 2016
 Note: Shares are among those who looked for jobs

Figure 2: Employment outcomes of graduates, by graduation year

10. The employment outcomes of polytechnic graduates are generally unsatisfactory with low employment and high incidence of unemployment. Only around half (48 percent) of the graduates who looked for jobs would be working (either full-time or part-time) after one or two years of graduation, while as much as a third of the graduates who looked for jobs would remain unemployed (Figure 2). Once unemployed, the situation may not look up very easily for them. The ratio of those with a job remain almost unchanged between the 2014 and 2013 cohorts (there is one year lapse between them). This clearly indicates a daunting prospect of prolonged joblessness and difficult school-to-work transition for many polytechnic graduates. Jobs do not seem to come to them easily despite holding diploma-level technical expertise. This prolonged joblessness also raises a serious question about the degradation of skills and technical knowledge of graduates, which further dampens their job prospects. On the other hand, differences in employment outcomes between graduates from public and private polytechnics appear to be insignificant.

11. Disparities in the employment outcomes are glaring. Female graduates are far more likely to be unemployed and out of study. Employment outlook seems quite bleak for many of the female polytechnic students. Compared with 49 percent of male graduates being on the job, only 38 percent of female graduates are found to be working. For female graduates, a fallback option of further education and training seems also more limited. Only nine percent of female graduates who looked for jobs are found to be studying full-time, whereas the share goes up to 19 percent for their male counterparts. As a result, a considerably greater proportion of female graduates are left unemployed in the job market. More than half (52%) of female graduates, who looked for jobs, remain jobless after one or two years of graduation, compared to 30 percent for males. This is an alarming figure for the TVET sector of Bangladesh which has been promoting diploma-level skills training for females.



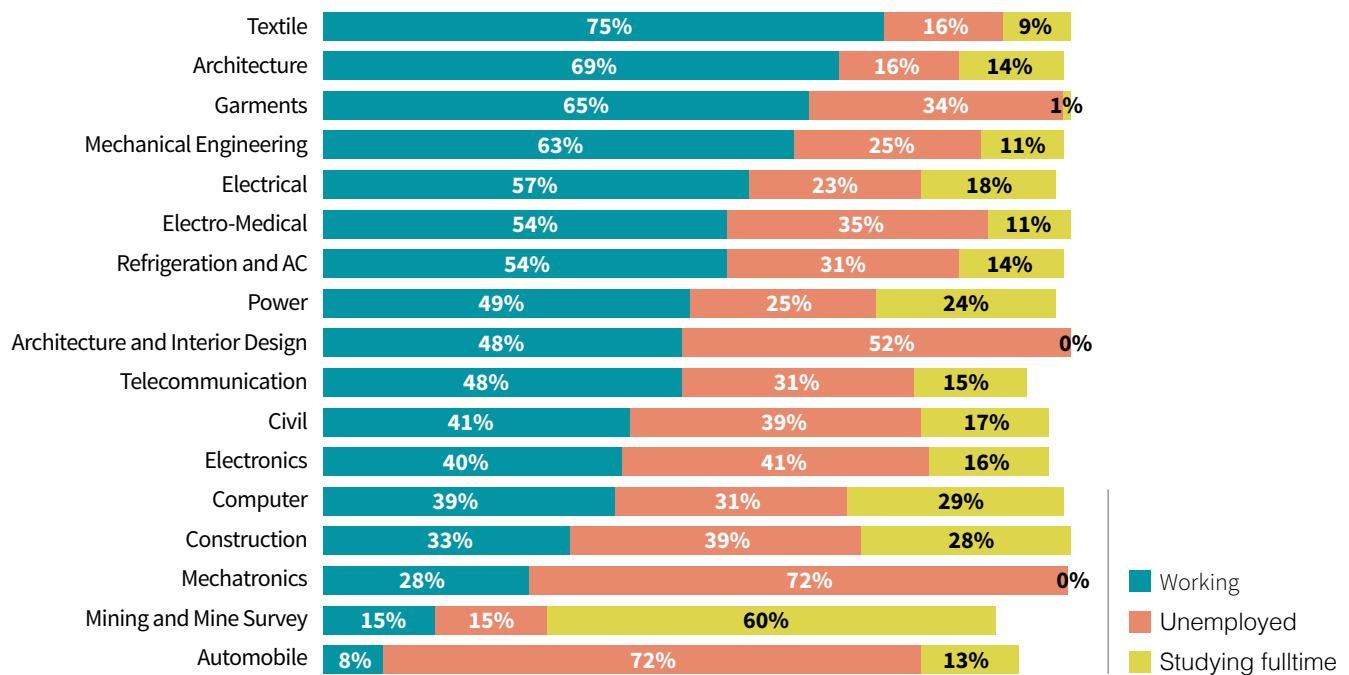
Source: Polytechnic Tracer Study 2016
 Note: Shares are among those who looked for jobs; females account for 11% of entire graduates

Figure 3: Employment outcomes among job-seeking graduates by gender

12. In rural areas, the shares of those who are working or studying are substantially lower than those from metropolitan and urban areas. Only around 35 percent of graduates now living in rural areas are employed, which is more than 10-20 percentage points lower than those living in metropolitan and urban areas. Assuming the skills level of graduates are not significantly different across locations of residence, this likely indicates a relative shortage of job opportunities in rural areas that demand diploma-level skilled workers. At the same time, opportunities for further education are not equal across geographical locations. Only a handful (seven percent) of graduates in rural areas are studying, as opposed to 26 percent and 13 percent of those living in metropolitan and urban areas doing so respectively. Consequently, unemployment is extremely high for graduates living in rural areas. As much as 57 percent of the graduates who looked for jobs and are currently living in rural areas remain jobless, compared to 25-30 percent in metropolitan/urban areas. It appears that graduates who cannot afford or decide not to move to metropolitan/urban areas would have to face severely grim employment prospects.

13. There are also considerable disparities in graduates' employment outcomes across technologies. Among the technologies offered in polytechnics, some technologies

such as Computer, Construction, or Automobile are not faring well in terms of finding employment. However, some of them also have high shares of graduates in further education and training. For instance, Power, Computer, Construction, and Mining Technology graduates are more likely to move on to further studies after failing in job search. Perhaps due to technological advances or higher job market competition, training at polytechnic alone may not be sufficient to find them relevant technical jobs. Some are faring much better in job market outcomes. As Bangladesh's apparel manufacturing industry continues to thrive, graduates of Textiles and Garments Technologies seem to be having easier time finding employment. Architecture, Electrical Technology and Mechanical Engineering Technology also seem to be performing better and have relatively strong performance in employment. The recent construction boom in Bangladesh may have contributed to better employment outcomes for students from those technologies. It is natural for different specialties to have different employment opportunities depending on economic and industry needs. It would be extremely useful for prospective students to have access to technology-wise employment tracking information in order to make more informed decisions when choosing technologies to enroll.



Source: Polytechnic Tracer Study 2016

Note: Shares are among those who looked for jobs; those in self-employment and unavailable for work are negligible and omitted from the chart; samples are not necessarily representative at the technology level.

Figure 4: Employment outcomes among job-seeking graduates by gender

14. The large majority of employers of polytechnic graduates are private enterprises or individually owned businesses; employment in government services are very rare, and small enterprises employ about half of polytechnic graduates. As much as 67 percent and 23 percent of the employed graduates are found to be employed by private enterprises and individually owned business, respectively. These are essentially business entities of different sizes in various industries in the private sector, collectively accounting for 90 percent of employment for polytechnic graduates. It is obvious from this finding that former students from polytechnics are a valuable source of skilled manpower for small and medium size enterprises in the economy. On the contrary, public sector employment, including both central and local ones, account for only a fraction (four percent) of employment for polytechnic graduates. The types of employers are not significantly different between male and female graduates. Public sector employment is equally rare for females as well. According to the definition of Bangladesh Bank, industries which employ less than 50 staff can be considered as small enterprises. It is found that around 44 percent of the graduates are employed in such small enterprises.

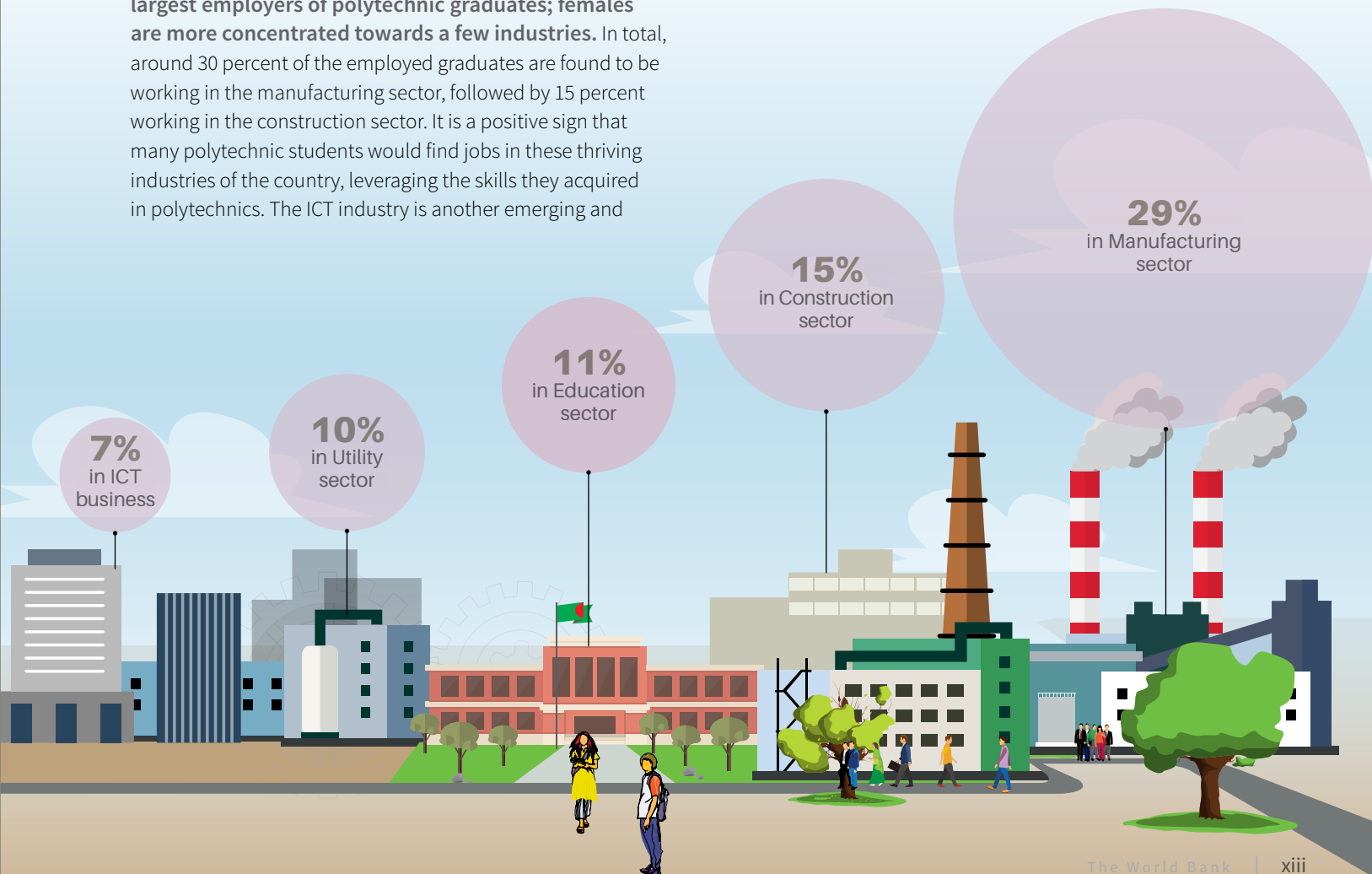
15. Manufacturing and construction businesses are the largest employers of polytechnic graduates; females are more concentrated towards a few industries. In total, around 30 percent of the employed graduates are found to be working in the manufacturing sector, followed by 15 percent working in the construction sector. It is a positive sign that many polytechnic students would find jobs in these thriving industries of the country, leveraging the skills they acquired in polytechnics. The ICT industry is another emerging and

booming industry in Bangladesh, which now employs around seven percent of graduates coming out of polytechnics. There are some gaps in the patterns of employing industries between male and female graduates. Naturally the construction sector employs fewer females. The education sector, where they are hired as instructors and trainers, is the largest employer for female graduates, employing about a third of the employed female graduates. The ICT industry is also a popular choice for female graduates where 14 percent of the employed female graduates are working.

Table 1: Industries of polytechnic graduates who are currently working

Industries	All	By Gender	
		Male	Female
1 Manufacturing	29%	29%	24%
2 Construction	15%	16%	6%
3 Education	11%	9%	32%
4 Electricity, gas, air conditioning supply	10%	10%	1%
5 ICT	7%	6%	14%

Source: Polytechnic Tracer Study 2016



16. On average, the employed polytechnic graduates are earning a monthly income of around BDT 10,800, the level overall comparable to the national averages; their wage levels are affected by a range of factors, particularly gender, contract type, and firm size. Overall, on average, female graduates are earning only around 75 percent of what their male peers would be earning (Table 2). However, the income gap, though still persistent, shrinks significantly if they are employed on permanent full-time contracts. On simple average, females are earning 83 percent of what their male counterparts would be earning. This is more or less consistent with the finding of the Labour Force Survey 2013 which shows the average salary of females in the technician occupation as 20 percent lower than that of males in the same category. Female graduates in rural areas appear to be at a significant disadvantage vis-à-vis their male counterparts as their average monthly earning is 43 percent lower². Across industries, gender earning gaps seem to be consistent. Firm size matters too. Larger firms do tend to pay better wages, and the differences are substantial. This large disparity across firms may explain why many graduates continue with their job search in a hope to find a better employment in well-established firms. Rural residence reduces the average salary significantly relative to metropolitan residence.

17. The unemployment rate for polytechnic graduates averages at 32 percent, and is considerably higher for female graduates and graduates living in rural areas.

Calculated as per the definition of this report (i.e., labor force participation defined as those who looked for work after graduation), the overall unemployment rate for polytechnic graduates at one or two years after graduation stands at 32 percent. The rate is far higher for female graduates, standing at 52 percent, a substantial gender gap of more than 20 percentage points. One of the reasons that female unemployment rate is so high is because a smaller proportion of females continue with further education compared to male graduates. The unemployment rate is even higher at 57 percent among graduates living in rural areas.

18. Long spells of joblessness are a common feature of unemployment among polytechnic graduates for both male and female graduates. The large majority – around 75 percent of the unemployed who graduated in 2013 (roughly two years before the time of data collection) – has reported having been unemployed for more than 12 months. As a matter of fact, most of them have never been under employment since they left the polytechnics. It was reported that only around 13 percent of the unemployed graduates of the 2013 cohorts have ever been employed in the past. The

Table 2: Average current salaries among wage employed polytechnic graduates

Industries	All	By Gender		
		Male	Female	GPI ³
All	10,843	11,088	8,308	0.75
By Contract Type				
Permanent Full-time	11,301	11,439	9,449	0.83
Non-permanent Full-time	9,713	10,157	6,865	0.68
By Location				
Metropolitan	11,122	11,280	9,657	0.86
Urban/Semi-urban	11,066	11,345	7,404	0.65
Rural	8,751	9,204	5,217	0.57
By Industry				
Manufacturing	11,754	11,990	8,799	0.73
Construction	10,925	11,004	8,904	0.81
Education	7,626	7,887	6,851	0.87
ICT	10,465	10,940	8,368	0.76

Source: Polytechnic Tracer Study 2016

² This figure is based on a small sample and should be interpreted with caution. There are only six samples that fall into this category of employed females in rural areas.

³ Gender Parity Index (GPI) is calculated as the figure for females divided by the figure for males. GPI below 1 indicates females underperforming males, and GPI above 1 indicates female outperforming males.

lengths of unemployment periods seem more or less similar for both male and female unemployed graduates, with females experiencing slightly longer periods of unemployment. On average, female unemployed graduates of the 2013 cohort have been jobless for 17.7 months, whereas their male peers have been so for 15.7 months.

19. The overwhelming majority of the graduates in full-time study are enrolled in universities, showing the strong demand for higher education qualifications among students in polytechnics. Overall, universities account for 87 percent of education institutions where polytechnic graduates are studying full-time after one or two years of graduation. This in itself is not surprising as Bachelor's degree would be the next logical step for Diploma holders. Most of the polytechnic students enter polytechnics with SSC degree only, and upon graduation, as Diploma holders, polytechnic graduates become eligible to apply for universities. Polytechnics give students in TVET tracks an important pathway to go on to higher education and subsequently towards better paid jobs with higher-order skills requirement. Nearly half of those who moved up to universities are enrolled in engineering universities.

Employers' View on Polytechnic Education

20. Employers want polytechnics to take steps to strengthen trainings on problem-solving skills, along with ICT skills and practical technical skills. Nearly all of the interviewed employers (over 80 percent) think polytechnics should enhance training on problem solving skills. Problem-solving skills are essential especially for professionals who have to deal with and deliver solutions to complex technical problems and business challenges. Given today's accelerated pace of technological changes and integration in globalized business environment, high-level cognitive skills such as this will continue to be in high demand. The survey responses show that employers are keen to see polytechnics teach and train students with teaching methodologies that can nurture creative problem-solving skills. Many employers (more than 70 percent) also want to see strengthening of training for the use of ICT as well as practical technical skills. Communication skill is also seen by many employers as a skill area needing more strengthening probably because they also see it as one of the weaknesses of polytechnic students.

Students' Satisfaction and Institutional Job Placement Service

21. Overall, students and graduates of polytechnics, especially private ones, are generally satisfied with the quality and relevance of training at the polytechnics; the quality of equipment and facilities seem least satisfactory. Both students and graduates seem generally satisfied with the overall relevance of training at polytechnics. Polytechnics did not gain student satisfaction in the ICT and soft skills as much as they did with the other aspects. Graduates' view about teachers' level of technical skills is more skeptical, probably because graduates are more aware of technical requirements in the real world of work. Satisfaction over the adequacy and quality of training facilities and equipment is noticeably low both among students and graduates. Students in private polytechnics are generally more satisfied with the quality of training than those in public polytechnics. It is perhaps because private institutions tend to have a greater flexibility for resource mobilization and allocation to invest in modern facilities and machineries.

22. Most of the surveyed polytechnics have job placement cells; however, students are not yet fully aware of job placement support service by their institutions, and private polytechnics are far more active in helping students in job search. Having established a job placement cell does not automatically mean that polytechnics are now able to provide adequate and effective job placement services. Considering that most of the polytechnics have only recently begun to provide job placement services, there still is a plenty of room for improvement and strengthening. Regarding industry partnership, most of the outputs from industry partnership are concentrated around the provision of additional training services for students, while industry involvement in curriculum design and teacher training is still limited. There is also a large room for increasing the communication between polytechnics and employers as only a small proportion of the employers of polytechnic graduates have regular contact and communication with polytechnics.

Recommendations

23. 1: Place graduates' employment firmly and squarely at the center of efforts for improvement of the polytechnic system. First and foremost, employment prospects of polytechnic graduates need to be improved if polytechnics are to continue to be a meaningful career pathway for students. The employment-centered approach would encompass the entire spectrum of polytechnic system's actions, including governance structure, institutional planning, monitoring and evaluation, curriculum design, teacher management, industry linkage, teaching facility and equipment, and job placement services; and should gear them strategically towards achieving the result of better employment outcomes. The current poor employment performance, if left unaddressed, may pose a serious, even existential, threat to the polytechnic system. The fact that more than 75 percent of graduates did look for jobs and the current students have expressed high expectation about the relevance of diploma degree to jobs indicates that students are coming to polytechnics with a hope that the technical diploma would land them worthy jobs after successful completion. However, as this report has discussed, nearly 60 percent of graduates would end up in either unemployment or having to continue with higher education. Polytechnics cannot afford to continue producing unsatisfied graduates, and, needless to say, joblessness takes a heavy toll on individuals and the system alike. Unemployed trained youths are human capital gone wasted and harmful to the economic growth as well as individuals' wellbeing and quality of life. The polytechnic system needs to be more thoroughly committed to making its training relevant to the industry needs and being more accountable to the employment outcomes of its students.

24. 2: Give greater emphasis to higher-order cognitive skills and soft skills training such as problem-solving skills and communication skills in pedagogy and curriculum in polytechnics; embracing fully competency-based training should be a priority to pave the way for a more flexible demand-driven curriculum. More and more employers in different industries in Bangladesh are coming to view the soft skills of employees as a critical asset for the productivity of their workplace and see that Bangladeshi youth are in general not well prepared in soft skills. This survey has also found that soft skills are one of the areas that employers want to see improved. It is recommended that the Board and polytechnics introduce in their curriculum special training programs specifically with an aim to impart essential soft skills to students (e.g. communication, team work, problem solving, critical thinking, etc.). To respond to the skills needs of industries, it would be highly beneficial

if Bangladesh's polytechnic system fully embraces the competency-based training model. The BTEB has introduced National Technical and Vocation Qualification Framework (NTVQF), but the implementation has been lagging. Steady transition to NTVQF-based training courses up to the diploma level should be one of the high priority agenda for Bangladeshi TVET system.

25. 3: Invest more to upgrade the technical and teaching skills of teachers as well as equipment and facilities. These are areas where students and graduates are least satisfied with and where employers would like to see more improvement. Improvement of employment outcomes cannot be accomplished without ensuring the quality and relevance of education and training imparted in polytechnics. Partnership with industries may well play a role in increasing the opportunity for teachers to have industry exposure to the latest technologies. This becomes even more important when the majority of teachers do not possess working experience in industries as found in this survey. Teacher vacancies are a critical issue that need to be resolved with utmost urgency. Teacher training for polytechnic teachers, both pre-service and in-service, should be strengthened to improve their pedagogical skills. TVET teacher training policies as well as roles of Technical Teacher Training College (TTTC) have to be reviewed. More financial resources from the government are apparently needed to modernize facilities and equipment to keep up with the basic requirements of modern industries. To diversify the sources of financing, MoE and polytechnics should consider possibilities of 'revenue generation' as part of the activities of polytechnics through the provision of life-long training and skills assessment to workers in their localities. Special attention should be paid to soft skills training. More than ever before, in the face of rapidly evolving technologies and globalized business operations, the success of technical experts is defined by the mastery of soft skills that allow them to work effectively and deliver solutions. A new curriculum can be developed and implemented to introduce soft skills development programs in polytechnics.

26. 4: Further strengthen partnership with industry in an effort to improve the quality of education and promote graduates' employment. Repeated recommendations have been made countless times about the importance of forging a strong partnership with industries. This report also finds yet another evidence of weak industry collaboration and engagement. Most of the polytechnics have only a small number of industry partners, and some do not even have a single partner. Most of the employers, despite having hired polytechnic graduates before, do not have any regular communication, let alone formal partnership, with

polytechnics. Industry partnerships are widely known to be extremely useful to ensure the relevance of training programs. Furthermore, industry partners are also potential employers. As found in this survey, establishing and maintaining regular communication channels with them would likely contribute to enhancing the chances of polytechnic graduates finding jobs with those employers.

27. 5: Expand and improve job placement support services to students at the institution level. Under the STEP, most of the participating polytechnics have introduced employment cells or career support centers in their institutions that are responsible for supporting students through the job search process. However, they are still at a nascent stage, and still obscure in terms of their role and presence. It is found that most of the services provided so far have been counseling and advisories. While those will undoubtedly benefit students, more systematic and institution-based support services are yet to take root in many of the polytechnics. For instance, institution-wide actions such as organization of job fairs and career seminars, partnering with industries for preferential job placement, and establishment of alumni networks are still not frequently done, but would have a substantive impact on raising institutions' capacity to support students. Moving forward, polytechnic institutions should emphasize how they can institutionalize employment cells and job placement support services at the institution level. In particular, public polytechnic institutions have a lot of work to do.

28. 6: Strengthen graduate tracking programs at the institution level to support more systematic and active job placement support. Tracing the whereabouts and job status of former students is essential for designing and implementing functional high-quality job placement support strategies for polytechnics. Proper identification and analysis of the employment pattern and history of past graduates would offer valuable clues to what the best strategies might be for the next graduates. At present, job placement services offered at polytechnics are not adequately based on evidences due to the lack of systematic collection of employment data from previous cohorts of graduates. Employment cells should introduce and institutionalize a graduate tracking mechanism. Already some of the private polytechnics have such a system in place where staff in charge of the employment cell maintains and update regularly a database of graduates and their current status mainly through contacting them over phone periodically.

29. 7: Institutionalize periodic tracking surveys of polytechnic graduates at a national level by Directorate of Technical Education. Many countries have established periodic graduate tracking programs for their TVET and higher

education systems. The central skills development agency has a critical role in ensuring the availability of relevant public knowledge about how skills training rendered by TVET institutions are benefiting the labor market. To do this, it is essential that updated systemic data are available that demonstrate how graduates of TVET are faring in the labor market and how employers are viewing the skills of TVET graduates. This study was a pilot in this sense which provided a snapshot of graduates' employment outcomes, and should be continued under the MoE. Conducting periodic graduate follow-up surveys and establishing a graduate database should be part of the regular task of the Directorate of Technical Education (DTE). Information obtained through the follow-up surveys would be the evidence base for designing courses and strategizing job placement services. Tracking can be done in different ways with different cost implications. Detailed efforts made in this study are one of the costly ways; however, such detailed data collection does need to be done on a regular basis. Cost-effective methods such as telephone survey or email survey should be explored as the way to establish a sustainable and regular graduate follow-up mechanism.

30. 8: Forge stronger ties with industry communities who would accept female technical specialists and technicians to boost job outcomes for female graduates.

While male graduates struggle with job search, female graduates are bearing the full brunt of an unfriendly job market environment. The disappointing state of female graduates' job placement that this survey found calls for tailored and targeted interventions to uplift the employment outcomes of female students. Given the differences in job search strategies between male and female students, job placement support for female students may well be somewhat different from that for male students. Female students are more likely to find jobs through networks (i.e. through personal and institutional references to potential employers). Polytechnics have a bigger role to play to refer their female students to companies which are receptive to the hiring of female technical workers. More companies need to be brought into partnership with polytechnics for finding posts for female graduates.

31. 9: Provide special training programs on entrepreneurship and business management to encourage entrepreneurship for polytechnic students.

Without a doubt, starting a business is not for everyone. Nonetheless, the near absence of self-employment among polytechnic graduates is indicative of the lack of appetite for running one's own business as well as the lack of practical knowledge and skills needed to be an entrepreneur and manage business operations. Expanding self-employment and entrepreneurship is certainly one of the ways to achieve

greater job creation and a vibrant economy through skills development. A range of skills and know-how are useful for potential entrepreneurs, including skills such as how to identify business opportunities, raise funds, market your services, and manage accounts, etc. These skills would be of significant values not only for graduates who would start up businesses soon after graduation but also for those who may become entrepreneurs after gaining some years of work experience. Current programs for entrepreneurship at polytechnics are not so conducive or practical. DTE/BTEB, working with the partners, should develop and implement practical entrepreneurship training programs for polytechnic students.

32. 10: Further strengthen the evidence-base in TVET to drive evidence-based discussion and policy making towards more and better employment. This study has answered many questions; however, there are still a lot of evidence gaps to be filled. Knowledge about teaching practices and teacher competencies at public and private polytechnics are generally lacking. It would be necessary to conduct

comparative analysis with employment opportunities and skills segments for graduates from other types of institutions such as general academic stream, colleges, and universities. More in-depth analysis of types of skills that employers are seeking from technicians and engineers would also be essential for future efforts to improve employment outcomes. A much better understanding of the skills demand and influencing factors is needed to analyze the reasons for high graduate unemployment despite the persistent claim of skills shortage in industries. Job markets are often imperfect, and knowledge of job market frictions and ways to alleviate them would be extremely useful. Insight into career progression and mid-career training opportunities for professionals, engineers and technicians would be crucial to design suitable training programs for upskilling needs and mid-career trainings. Moving forward, further investigations in the TVET sector are warranted to build a stronger evidence-base to steer policy discussions to the improvement of polytechnic education and graduates' employment outcomes.



Chapter 1

INTRODUCTION

1.1 BACKGROUND

1.1.1 Labor market context

1. Bangladesh is a country with a large youthful population and rapidly growing labor market. Out of its estimated 154 million people, around 40 percent are below 20 years of age⁵. The demographic trend is offering the country an once-in-a-lifetime opportunity to reap the benefit of what is known as demographic dividend, a period in which the working-age population will have a low proportion of dependent young and old people, and be in a better position to enjoy the benefit of faster economic and social development. The country has achieved a tremendous economic growth and made a huge stride in poverty reduction over the past few decades. The average economic growth rate has been around six percent over the past decade, and the poverty headcount ratio has dropped from 48.9 percent in 2000 to 31.5 percent in 2010⁶.

2. The economic growth has been transforming Bangladesh's labor market structure, increasingly demanding a better educated and skilled workforce. The agriculture sector still absorbs the largest chunk of workers and accounts for around 45 percent of the employment (Table 1-1). Nevertheless, the past decade has witnessed

Table 1-1: Employed persons aged 15 years and over by major industry in 2005, 2010, and 2013.

Major Industries	Share of Employed Persons (%)		
	2005	2010	2013
Agriculture, forestry and fishing	48.1	47.6	45.1
Manufacturing	11.0	12.5	16.4
Construction	3.2	4.8	3.7
Whole sale, retail, repair of motor vehicle	15.0	14.0	13.0
Transportation	8.4	7.4	6.4
ICT	-	0.1	0.2

Source: Data from the Bangladesh Labour Force Survey of respective years.
Note: ICT industry did not have its own category in 2005, and was included under Transportation

⁵ According to the Bangladesh Labour Force Survey 2013.

⁶ According to World Data Bank

dramatic shifts in the labor market with an increasing share of the labor force employed in industry and service sectors which now employ 21 percent and 34 percent of the total labor force, respectively. Every year more jobs are created in the manufacturing sector, owing to the remarkable development of the garment sector where numerous jobs are being created especially for female workers. The share of persons employed in manufacturing industry has grown from 11 percent in 2005 to 16 percent in 2013. The increased jobs in industry and service sectors tend to call for more educated workers. Among the employed individuals, the industry sector employs around 20 percent of higher secondary (HSC) graduates and 19 percent of tertiary graduates, while the service sector absorbs 58 percent of HSC graduates and 71 percent of tertiary graduates in 2013.

3. Despite all the laudable achievement in human resource development, Bangladesh's economy still suffers from a shortage of skilled manpower.

Bangladesh's labor force is still under-educated and under-trained. Twenty-eight percent of people aged 15 or above have never attended schools, and only around 14 percent of the population have HSC or above. Tertiary education has been rapidly expanding in recent years, yet remains out of reach for many youths. Vocational training opportunities are not readily accessible and under-utilized. Only around five percent of the population aged 15 or above have had any vocational training to develop their skills⁷. Enterprise skills survey by the World Bank⁸ reported low satisfaction among employers about their employees' skills level both in cognitive and non-cognitive skill sets. A country diagnostic study by ADB⁹ also identified low human capital as a significant constraint for the Bangladeshi economy. In order to sustain the economic growth and expand exports to the global market, Bangladesh needs to urgently accelerate productivity growth by filling skills gaps in the labor market.

1.1.2 TVET System in Bangladesh

4. The Government of Bangladesh has made skills development one of the national priorities towards achieving accelerated economic growth and poverty reduction. The Seventh Five-Year Plan FY2016-FY2020 places an emphasis on expanding the human capital base to respond to the anticipated labor market needs generated by a growing and changing economy. The plan thus attaches greater importance on secondary education, higher education, vocational and technical education, and skills development training for employment. It further calls for renewed attention to the upgrading of skills for the workplace and greater partnership with the private sector for the design and implementation of training programs including support for the on-the-job training. The National Education Policy (NEP) 2010 formulated by the Ministry of Education (MoE) also places an emphasis on technical and vocational education and training (TVET) to facilitate productivity growth and self-employment. Based on the NEP, MoE set out a National Skills Development Policy 2011 as an overall guiding framework for the skills development sector in Bangladesh.

5. The TVET system in Bangladesh is fragmented and heterogeneous with a diverse range of sectors and institutions involved in the provision of skills training at different levels. Skills training providers in Bangladesh are comprised of four main groups: (1) public training providers (e.g. training institutes under MoE, training centers supported by various line ministries); (2) private training providers (e.g. private polytechnics and short-course training providers under the government accreditation); (3) industry-led training providers (e.g. training centers operated by Industry Associations or individual enterprises); and (4) NGO-led training providers scattered across the jurisdictions of as many as 20 different ministries¹⁰. To coordinate across those diverse stakeholders in skills development, the National Skills Development Council (NSDC), chaired by the Prime Minister, was established in September 2018 under the Ministry of Labour as an apex coordination body to

⁷ According to the Bangladesh Labour Force Survey 2013.

⁸ World Bank. (2013). An Assessment of Skills in the Formal Sector Labor Market in Bangladesh: A Technical Report on the Enterprise-Based Skills Survey 2012. Washington, D.C.

⁹ Asian Development Bank. (2016). Bangladesh: Consolidating Export-led Growth - Country Diagnostic Study. Manila.

¹⁰ Bangladesh Technical Education Board. (2013). An Overview of Bangladesh's Technical and Vocational Training Sector: Stocktaking, Analysis, and Policy Recommendations for the Way Forward. Dhaka; Ministries that are actively providing skills training include, not limited to: Education; Expatriate Welfare and Overseas Employment; Textile and Jute; Agriculture; Environment and Forest; Fisheries and Livestock; Civil Aviation and Tourism; Local Government, Rural Development and Cooperatives; Youth and Sports; Industries; ICT; Health and Welfare; and Power, Energy and Mineral Resources.

provide overall policy guidance for the skills development sector. The members of NSDC include high-level representatives from relevant ministries and representatives of different trade and industry bodies. NSDC has an Executive Committee, co-chaired by the secretary of MoE and a representative of the private sector. There is also a Secretariat for NSDC that is responsible for supporting the operation of NSDC and implementation of the skills development action plan.

6. The past decade witnessed an astonishing pace of expansion of the formal technical and vocational education system. In 2015, a total of around 873,000 students (24 percent are female) are enrolled in public and private TVET providers. From 2009 to 2015, the total enrollment in formal skills training institutions nearly doubled from just around 475,800 to 872,700 (Table 1-2). At the same time, this massive expansion of enrollment was able to occur gender-neutrally, which is an achievement in itself for often male-dominated TVET systems. The overall ratio of female students in the TVET system has remained more or less constant over the same period. A clear and more powerful shift was at the post-secondary level. Female representation did increase significantly in diploma level polytechnics. The share of female polytechnic students jumped from 7.7 percent in 2009 to 14.3 percent in 2015. Females are increasingly seeking skills development opportunities to find better employment and earn better incomes. Infrastructure was also improved for female participation. More female polytechnics have been built throughout the country with dormitory facilities for students from afar. Interventions such as the stipend program for female polytechnic students and frequent awareness-raising campaigns for the promotion of female participation in TVET have also drawn more female secondary graduates into polytechnic education.

7. Polytechnics in Bangladesh offer four-year diploma courses to secondary graduates; the numbers of polytechnic institutions and students have been growing rapidly. Polytechnic enrollment has nearly tripled from 76,500 in 2009 to 201,700 in 2015. Likewise, polytechnic institutions also mushroomed throughout the country, growing from 171 schools to 433 schools. The expansion of the polytechnic system has been in part in response to the growing demand for post-secondary education as students passing the secondary education examinations increased from 697,000 in 2009 to 1.2 million in 2015¹¹. In Bangladesh, the education prerequisite for admission to polytechnics is secondary education completion (Grade 10). Upon graduating from secondary schools, students would have academic options of moving up to two-year higher secondary education or taking a vocational training course at diploma-offering institutions. Polytechnics provide four-year diploma courses in a host of technologies to prepare students for works in technical and engineering occupations. At the same time, polytechnic diplomas are not the terminal degree. Polytechnic graduates would be qualified to apply for university admission if they wish to pursue higher levels of engineering qualification. The private sector is playing an important role in the provision of polytechnic education. Around 74 percent of all the enrollment in TVET in Bangladesh is in private institutions. Bangladesh Technical Education Board (BTEB) is the central statutory body that is responsible for organizing, supervising and controlling technical education programs, and officially grants affiliations to TVET institutions including polytechnics. Curriculum and examination of affiliated TVET institutions including polytechnics are centrally designed and supervised by BTEB.

Table 1-2: Total student enrollment and share of female in TVET institutions

	2009	2011	2013	2015
All formal skills training institutions*	475,848	506,556	645,985	872,658
(% female)	23.8	27.0	28.3	23.9
Secondary level vocational education	349,128	340,801	418,952	562,677
(% female)	28.3	33.8	34.9	26.9
Polytechnics	76,540	102,112	151,333	201,704
(% female)	7.7	10.7	12.3	14.3
(Number of polytechnic institutes)	171	171	270	433

Source: Annual education statistics of Bangladesh Bureau of Educational Information and Statistics
Note: Formal skills training include: polytechnics; secondary-level vocational education; and specialized diploma-level institutes and training centers

¹¹ According to BANBEIS, the number of students who passed Secondary School Certificate (SSC) or Dakhil examination increased from 697,322 in 2009 to 1,191,071 in 2015.

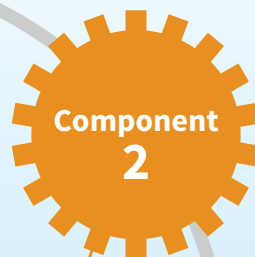
1.1.3 Skills and Training Enhancement Project (STEP)

8. To enhance the access, equity, and quality of the skills development trainings in the country, the Government of Bangladesh (GoB) launched Skills and Technical Enhancement Project (STEP) in 2010 funded by the GoB, World Bank, and the Government of Canada with the expected closing date of June 30, 2019. The objective of STEP is to strengthen selected public and private training institutions to improve the training quality and employability of trainees, including those from disadvantaged socio-economic background. To achieve the objective, the project has been supporting the TVET sector through the following **four components**.



Component 1

10. Pilots in TVET: This component supports innovative programs and pilot interventions in the TVET sector. It has been supporting operationalization of National Skills Development Council (NSDC) Secretariat and Industry Skills Council (ISCs) as a platform for coordination of skills development and promotion of private partnership for skills training. It has also supported the design and pilot implementation of a new apprenticeship program at the secondary education level, and piloted and expanded the Recognition of Prior Learning (RPL) program.



Component 2

9. Improve the Quality and Relevance of Training:

Under this component, diploma level polytechnic institutions and short-course training providers are supported by institutional development grants and financial support to disadvantaged students. By 2015, grants were provided to 33 polytechnic institutions (25 public and 8 private) to improve the teaching and learning environment of the institutions, and stipend support have been given to 93 polytechnic institutions (43 public and 50 private) supporting disadvantaged male and female students. These 93 polytechnics constitute the sampling frame of this study.



Component 3

11. Institutional Capacity Development:

This component focuses on strengthening the institutional capacity of the key government agencies of the skills development sector to enhance the effectiveness and efficiency of skills sector management and operation and to ensure the sustainability of reforms introduced. The component also supports the strengthening of teaching capacity in TVET through deployment and training of contract teachers to fill the large teacher vacancies in polytechnic institutions and to provide capacity development support to technical teacher training institutions to improve the quality of teacher training for teachers in TVET institutions.



Component 4

12. Project Management, Communication, Monitoring and Evaluation:

This supports the project management and monitoring and evaluation to ensure effective and efficient implementation of the project interventions and reform activities. It also supports the implementation of a range of communication strategies to raise awareness of the public about the project, importance of developing skills, and opportunities for skills development trainings. The skills development sector is vastly under-researched. Research works and assessment studies on a variety of development issues in the sector are also supported, including this graduate tracer study.

1.2 OBJECTIVE OF THE STUDY

13. This study was commissioned as part of the research activities of the STEP project to inform the skills development sector of Bangladesh. The study is intended for a wide range of stakeholders in skills development in and out of Bangladesh, including policy makers, relevant officials, TVET practitioners, and development partners of skills development, to offer a useful evidence base for policy dialogue and further analysis. Prior to this research, there was no systematic studies done in Bangladesh to investigate the employment outcomes and economic situation of graduates of polytechnic. This study aims at filling this critical knowledge gap and providing much-needed evidence base for future discourse towards improvement of the quality of TVET in Bangladesh.

14. The primary objective of this tracer study was to assess: (1) the employment outcomes and wages of polytechnic graduates and factors affecting them; (2) polytechnic institutions' capacity for training, industry linkage, and job placement; (3) expectations and perception of employers about polytechnic education and graduates; and (4) characteristics of polytechnic students and motivation for and perception about training in polytechnics. Finally, the report will present recommendations to improve the quality and relevance of polytechnic education in Bangladesh.

1.3 METHODOLOGY

1.3.1 Survey methods and instruments

15. This study conducted an extensive field survey to gather information from the main stakeholders of the polytechnic system in Bangladesh. The survey targeted four respondent groups to capture the information more holistically from different viewpoints of different stakeholders. The four respondent groups are: (1) graduates who graduated from polytechnics one or two years ago; (2) students who are currently studying at the fourth year in polytechnics; (3) polytechnics, represented by principals; and (4) employers of polytechnic graduates.

16. For graduate respondents, this study traced a representative sample of the graduates who completed their training at one of the 93 STEP-supported polytechnics either in the school year 2013 or 2014. Tracking of graduates was done through contact information available in the registry books of the institutions. Graduates were contacted by phone calls to identify their current whereabouts. Collection of information from graduates was done through face-to-face interviews using structured interview questionnaires, rather than through post mails or e-mails to ensure the quality and quantity

of information. Surveyors were deployed physically to meet every graduate in their localities.

17. For current student respondents, a representative sample of the students who are studying at the final year of their training at the STEP supported polytechnics in the school year 2015. Surveyors were deployed to the institutions to conduct face-to-face interview with individual students who were sampled.

18. Data collection instruments used include four structured questionnaires, namely, (a) graduate questionnaire; (b) current student questionnaire, (c) institution questionnaire; and (d) employer questionnaire. Questionnaires were prepared by the World Bank team in collaboration with STEP and the survey firm. All the questionnaires were coded into a Computer Assisted Personal Interview (CAPI) software on Android based tablet. Surveyors were given training on the use of CAPI application. The questionnaires and CAPI tools were pilot tested for refinement of questions and adjustment in system configurations.

19. Data collection in the field took place from 14 February 2016 to 07 April 2016, during which 15 investigation teams consisting of a total of 45 surveyors (three surveyors in each team) were deployed to conduct face-to-face interviews. Interview data entered through CAPI were instantly transmitted to the central server where reviews on the data quality were done by the supervisors. Details on survey methods are provided in Annex 1.

1.3.2 Data and Sampling

20. In total, the survey gathered the data from (i) 2,000 graduates who completed the training at polytechnics in 2013 or 2014; (ii) 1,000 students who are currently in polytechnics; (iii) 200 employees who are employing graduates of polytechnics; and (iv) representatives of 25 public and private polytechnics. For distribution of basic characteristics of sampled students and graduates, refer to Annex 3.

21. The samples were selected through multi-stage stratified random sampling. The sample frame includes the 92 public and private polytechnics¹² that are supported by the STEP (among them, there are 42 public and 50 private polytechnics). The primary sampling unit was polytechnics. The polytechnics were stratified into four groups along the categories of public/private and recipient/non-recipient of the grant program of the STEP. A total of 25 polytechnics were randomly selected from the polytechnics with the probabilities of selection adjusted as proportionate to their student intake capacity (i.e. Probability Proportional to Size sampling; PPS). PPS was applied with an intention to ensure that institutions with greater presence in the system get greater chances of being in the sample so that the selected sample would

reflect the overall picture of the system more accurately¹³. After the selection of 25 polytechnics, all the courses (153 courses) offered in the 25 polytechnics were stratified by technology category into four groups. A total of 100 courses were then randomly selected out of the 153 courses. Finally, for each of the 100 courses, 10 students in the final year of study as well as 20 graduates who graduated one or two years ago were randomly selected without stratification. Graduate respondents were picked out from the student registry data archived at the individual polytechnics. Among them, 212 graduates (11 percent) and 162 students (16 percent) are females. Selected graduates were contacted through the contact information on the registry data. Student respondents were selected from the list of attendees of the class. Employer respondents were randomly picked up from among employers who happen to have employed any of those 2,000 selected graduates. An overview of student and graduate respondents in the final sample is as shown in Table 1-3 and Table 1-4 below. Details on sampling and weight calculation are provided in Annex 2.

22. It should be noted here that, because of the nature of the sample frame (i.e., STEP-supported polytechnics), the sample may not necessarily be representative of all

the polytechnics that exist in Bangladesh today¹⁴, especially for private polytechnics. Private polytechnics outnumber public ones and have been rapidly growing due to the surge in demand for post-secondary education and training¹⁵. Many of the private polytechnics are young institutions with limited intake capacities and a few courses on offer, and collectively enroll a limited number of students. The 50 private polytechnics receiving support from STEP were chosen among relatively well-established private institutions on the basis of their operational track records and institutional capacity. In fact, the 92 polytechnics included in the sample frame represented 63 percent of the entire intake capacity of the polytechnic community at the time of survey. Thus, it can be said that the sample frame of this study generally covers the mainstream population of the polytechnics in Bangladesh, and it is therefore reasonable to assert that the findings drawn from the sample of this survey represents the reality of the main groups of polytechnics in the country. That said, it should still be kept in mind that the reality of those smaller and weaker but copious polytechnics, which also deserve a special attention of its own, may not be fully accounted for in this study.

Table 1-3: Numbers of sampled students and graduates by technology group

Technology Groups	Students	Graduates
Group 1: Architecture, construction, civil, survey	260	520
Group 2: ICT, design, graphic	230	460
Group 3: Electrical & electronics	260	520
Group 4: Mechanics, automobile, marine, shipbuilding, aircraft, RAC, power tech, textile	250	500
Total	1,000	2,000

Table 1-4: Characteristics of sampled students and graduates (%)

		Students	Graduates
Gender:	Female	10.6%	16.2%
Age:	19 or younger:	25.0%	21 or younger: 14.7%
	20 years old:	45.7%	22 years old: 34.2%
	21 or older:	29.3%	23 years old: 25.3%
Home Address:	Metropolitan	10.5%	9.6%
	Urban	23.4%	31.8%
	Rural	66.1%	58.6%

Source: Polytechnic Tracer Study 2016
Note: Home Address refers to residential location of parents

¹² One STEP supported polytechnic was upgraded to college, thus omitted from the sample frame.

¹³ Polytechnic institutions in Bangladesh vary considerably in size. The large polytechnics have an annual new intake of around 1,000 students while smaller polytechnics have less than 100 annual new intake capacity.

¹⁴ In terms of student intake, polytechnics in the sample frame account for around 63 percent of the entire polytechnic students.

¹⁵ At the time of the survey, there were around 363 polytechnics which registered new students in the previous year, out of which only 50 were public and 313 are all private.



Chapter 2

BACKGROUND OF POLYTECHNIC STUDENTS AND THEIR TRAINING EXPERIENCES

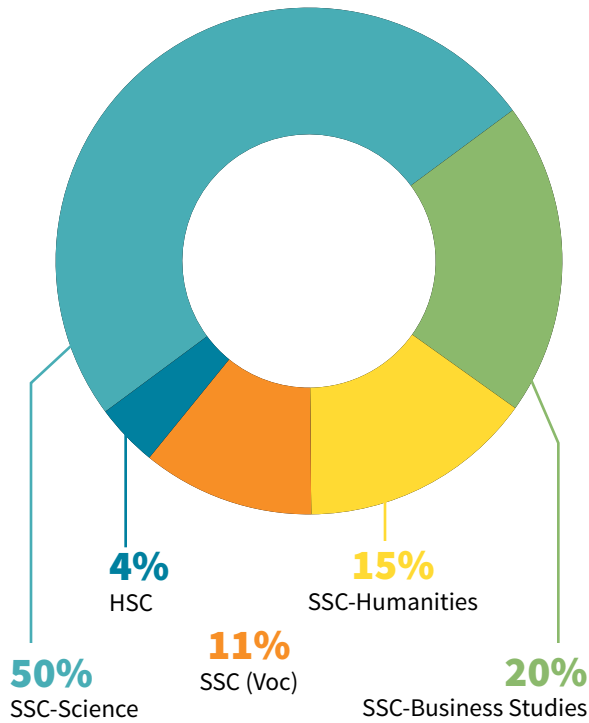
23. This chapter will look at the general characteristics of polytechnic students to better understand the academic and socio-economic background of polytechnic students. Then, students' and graduates' views on training services rendered in polytechnics will be analyzed to see if polytechnics are meeting their expectations. It will also conduct inquiries into the motivations and expectations of students for choosing to enroll in polytechnics among other education and training alternatives. Finally, this chapter will also conduct a brief analysis of how students are financing their studies at polytechnics especially in relation to the need for borrowing and external financing.

2.1 BACKGROUND OF POLYTECHNIC STUDENTS

24. Most of the diploma students are graduates of secondary schools (Grade 10), especially from the science stream. Overall, almost all (96 percent) of the polytechnic students are secondary school (SSC) graduates¹⁶ either from the general education streams (i.e. Humanities, Business Studies, or Science) or vocational stream (Figure 2-1). Polytechnics have been an avenue for post-secondary education and training for some of the SSC graduates who want to pursue technical education. Half of the students are coming from the Science stream of SSC, despite the relatively small share of Science stream students in the overall SSC student population¹⁷. Students from the Vocational stream (i.e., SSC (Voc)) also account for a certain share (11 percent) of polytechnic students which is equivalent to the overall share (around 10 percent) of SSC (Voc) students. On the other hand, an insignificant share (4 percent) of polytechnic students are coming from HSC schools. HSC graduates seem to be largely uninterested in pursuing technical training in polytechnics. It is also found that very few of the polytechnic students possess prior work experience (only about four percent have any prior work experience).

¹⁶ In Bangladesh, SSC is from Grade 9 to Grade 10, which follows five years of primary schooling (Grade 1 – 5) and junior secondary (Grade 6 – 8).

¹⁷ According to BANBEIS data, only around 21 percent of the general education SSC students were in the Science stream in 2012, around the time when survey student respondents graduated from SSCs. SSC (Voc) students accounted for slightly less than 10 percent of all the SSC students in the same year.

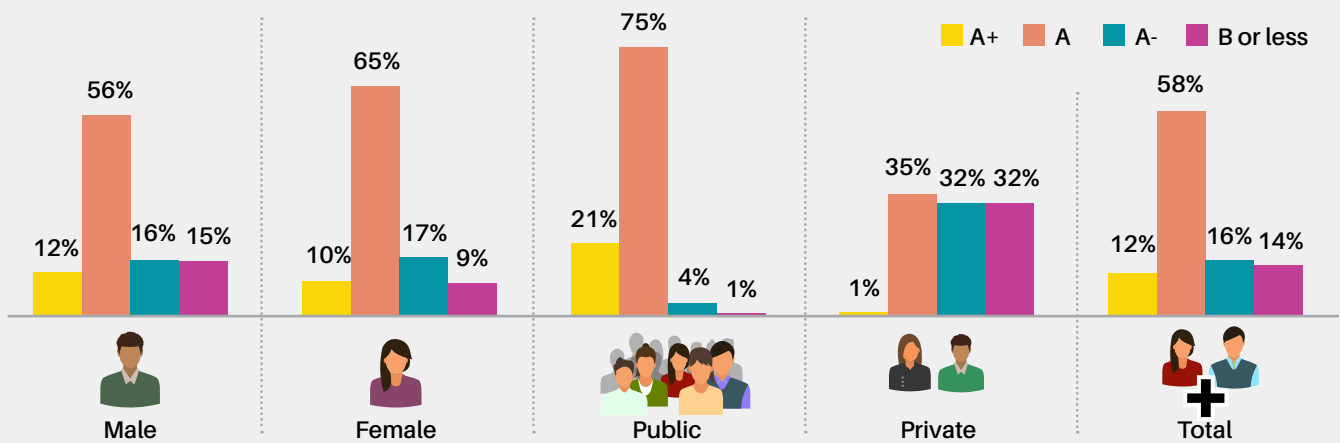


Source: Polytechnic Tracer Study 2016

Figure 2-1: Education background of polytechnic students

25. Polytechnics, especially public polytechnics, are attracting academically strong secondary education graduates.

Figure 2-2 shows the distribution of SSC terminal examination GPA scores among polytechnic students. Around 70 percent of the polytechnic students completed their SSC with at least GPA-A (equivalent of at least 70 percent mark), which can be considered as good academic performance. The share of those who obtained the highest grade (GAP-A+) is around 12 percent. These shares compare far favorably with the national average. Country-wide in 2012¹⁸, only seven percent and 26 percent of the students who sat for the SSC national examination obtained GPA-A+ and GPA-A scores, respectively. It appears that most of polytechnic students are academically sound students who had satisfactory performance in secondary education. There are no significant differences across gender. Male and female polytechnic students appear to have similar academic records of the SSC exam. There is, however, a distinctive gap between students in public and private polytechnics with regard to academic performance at the point of entry. Public polytechnic students are generally higher achievers compared to those enrolled in private ones. Around 96 percent of students in public polytechnics had achieved at least GPA-A in their SSC terminal examination while the figure drops to only 36 percent for those in private polytechnics.

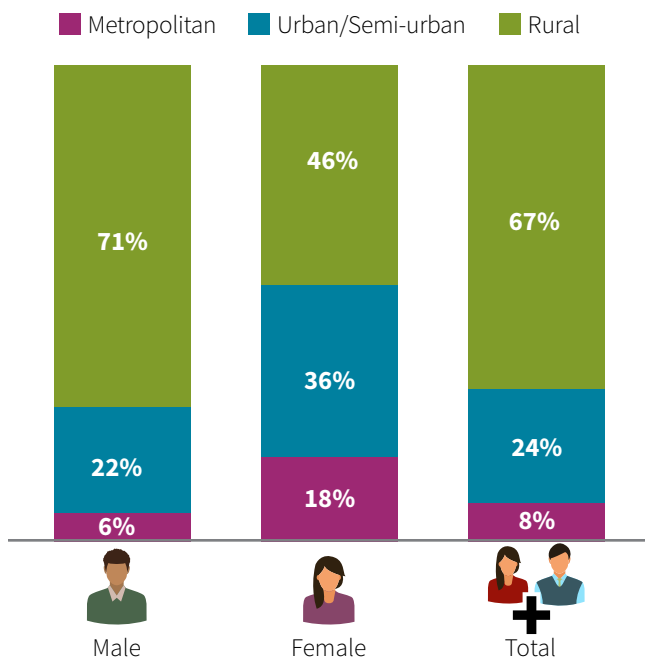


Source: Polytechnic Tracer Study 2016

Figure 2-2: Proportion of polytechnic students by SSC national examination GPA result

¹⁸ These students under study joined polytechnics in 2012.

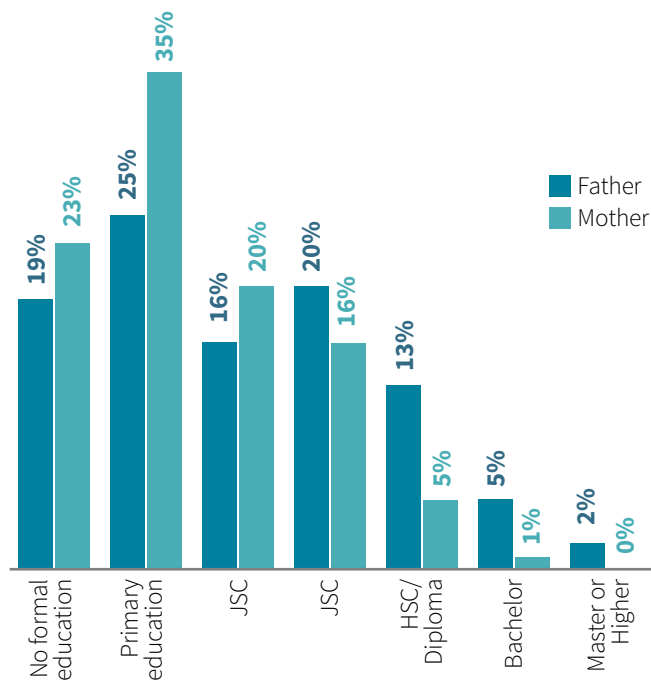
26. Access to polytechnic education seems equitable in terms of geographical differences; the majority of the polytechnic students are coming from rural areas. It is found that around 67 of polytechnic students are coming from families living in rural areas (Figure 2-3). The share of students of rural origin is even higher for males as 71 percent of them are from rural families. This ratio is more or less commensurate to the overall share of rural population in Bangladesh¹⁹. This indicates that polytechnics present rural families with a more realistic and fair chance to post-secondary education and training for their children, unlike universities and colleges to which access is more competitive and often harder to be attained for rural families. In this sense, polytechnics are valuable avenues for bright rural youth for gaining high-order technical skills and possibly making inroads into non-agricultural high-productivity jobs in manufacturing or service sectors in urban and metropolitan areas. By contrast, only about 46 percent of all female polytechnic students are from rural areas. This is likely because of the traditional cultural norms that the restrict mobility of females.



Source: Polytechnic Tracer Study 2016

Figure 2-3: Geographical location of origin of polytechnic students

27. Family background of polytechnic students seem generally humble; they typically come from families with modest education background (secondary education or less) and have parents working in agriculture. Figure 2-4 below shows that around 44 percent and 58 percent of fathers and mothers of polytechnic students, respectively, have only primary education qualification or less, while 36 percent of fathers and mothers have up to JSC or SSC qualification. Only about seven percent of fathers and one percent of mothers hold a bachelor degree or higher. Relative to the general population of Bangladesh, parents of polytechnic students hold marginally better qualifications²⁰. With respect to parents' occupation, it is found that around 47 percent of fathers are working in agricultural, forestry and fishery sectors. Less than 20 percent of students have parents who are working as professionals or managers. It is evident that many of the polytechnic students are coming from less privileged families with limited exposure to formal education.



Source: Polytechnic Tracer Study 2016

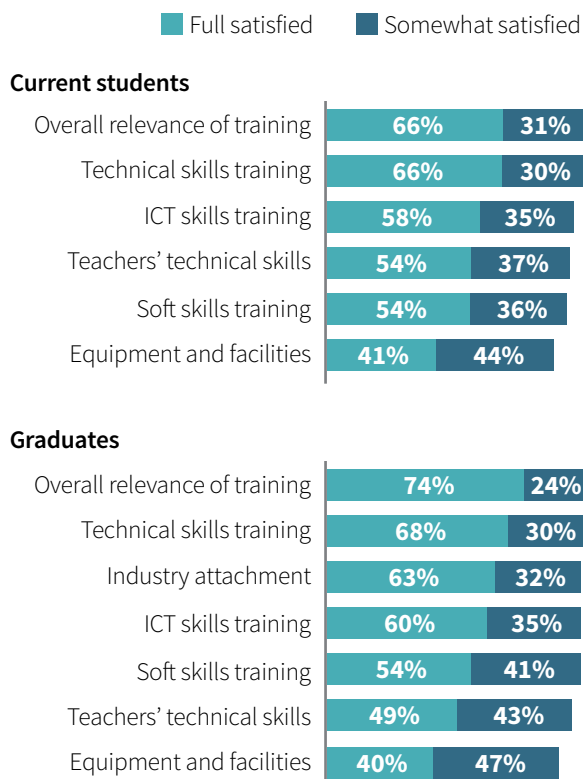
Figure 2-4: Educational qualification of parents of polytechnic students

¹⁹ According to Household Income and Expenditure Survey 2010, around 74 percent of the entire population reside in rural areas.

²⁰ According to the Labour Force Survey 2015, 38 percent of the population have no education qualification, while 29 percent hold only primary education, 14 percent hold junior secondary, and 13 percent have secondary education.

2.2 PERCEPTION ABOUT THE QUALITY AND RELEVANCE OF TRAINING

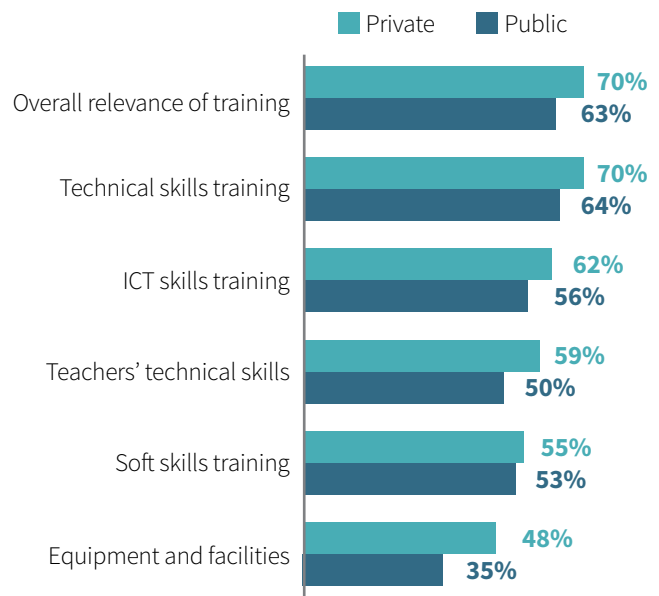
28. Overall, polytechnic students and graduates are generally satisfied with the quality and relevance of training at the polytechnics; the quality of facilities and equipment seem least satisfactory. The figure below presents the level of satisfaction among current polytechnic students and polytechnic graduates about the aspects of quality and relevance of training at polytechnics. Both students and graduates seem generally satisfied with the overall relevance of training at polytechnics. Similarly, the majority are satisfied with technical skills learned at the polytechnic which provide a good basis for future work. Students and graduates are somewhat less satisfied with trainings on ICT and soft skills. Graduates' view about teachers' technical skills is underwhelming, probably because graduates are more aware of technical requirements in the real world of work. Satisfaction over the adequacy and quality of training facilities and equipment is noticeably low both among students and graduates.



Source: Polytechnic Tracer Study 2016

Figure 2-5: Satisfaction about polytechnic education among current students and graduates

29. Students in private polytechnics are generally more satisfied with the quality of training than those in public polytechnics. The level of satisfaction appears to be somewhat higher among private polytechnic students across all the questions (Figure 2-6). More noticeable difference is found on the satisfaction about training equipment and facilities. Around 48 percent of private students indicates that they are fully satisfied about facilities and equipment while only 35 percent of the public polytechnic students indicate the same. Private students indicated greater satisfaction about facilities and equipment across all technologies. It is perhaps because private institutions tend to have a greater flexibility for additional resource mobilization (they are fully funded by fees) to invest in modern training facilities and machineries.



Source: Polytechnic Tracer Study 2016

Figure 2-6: Share of Fully Satisfied among students by ownership

Box 1: Strengthening teaching and learning environment at polytechnics through school-based financing

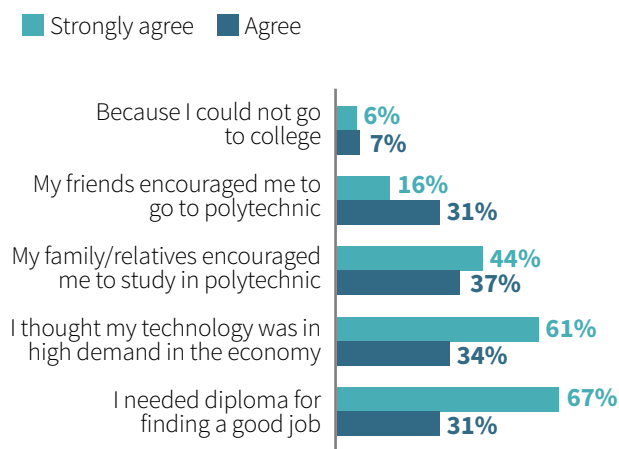
Teaching equipment and facilities at polytechnics are often outdated and out of touch with the latest technological advances in the industries. To enhance the quality and relevance of training, Skills and Training Enhancement Project (STEP) has been intensively supporting investments in updating and modernizing the teaching and learning environment at polytechnics. To ensure investments are needs-based, block grants were provided to polytechnics based on institutional development plans formulated by the polytechnics themselves. Up to USD1 million was offered to each of the 33 beneficiary polytechnics to finance a host of investments in teaching and learning improvement, including, among others, upgrading of classrooms, renewing teaching equipment and machineries, creating ICT-based learning environment, organizing industry tours and workshops for students and teachers, teacher professional development, and improving hostel facilities.

Source: STEP Semi-annual Progress Report, January-June 2016

2.3 MOTIVATION AND ASPIRATION FOR POLYTECHNIC EDUCATION AND TRAINING

30. Enrollment in polytechnic was a preferred choice, rather than a second-best fallback option, of post-secondary education for most of the diploma students, and motivated by their belief about better job prospects that technical degrees would bring about. Around 80 percent of the students responded that they did not consider and apply for any other options when deciding on their post-secondary education. Only a small group of students (less than 15 percent) agreed that they chose polytechnic because they failed at college entrance. Moreover, a significant number (67 percent) of the students strongly agreed that they chose to enroll in a polytechnic because they thought the technical diploma would eventually lead to a good job, while 61 percent strongly agreed that they chose their technology because they thought it was highly demanded in the current economy. This shows that among students there is a certain degree of preference for technical education to general education as academic pathway, and there is a high expectation among students about the technical training offered by polytechnics in enabling them to acquire technical skills demanded in the labor market. This likely indicates that, at least for technically oriented students and their parents,

the economic and educational value of technical education and trainings in polytechnics is gaining greater recognitions. In many other parts of the world, traditional ideas die hard and postsecondary TVET courses are perceived as inferior academic tracks and fallback option after general education courses. Such views may be fading in Bangladesh and giving way to proper recognition of due values of TVET courses.



Source: Polytechnic Tracer Study 2016

Figure 2-7: Reasons for deciding to enroll in a polytechnic and choosing the technology

2.4 PRIVATE FINANCING, LOANS AND FINANCIAL SUPPORT FOR POLYTECHNIC STUDY

31. Polytechnic education is not cheap; roughly speaking, polytechnic students can expect to spend around BDT40,000 (US\$500) annually for various study related expenditures, while private students are spending substantially more. The table below shows the average self-reported annual out-of-pocket expenditures that polytechnic students and their families spent over the past 12 months (Table 2-1). On average, polytechnic students have to pay around BDT39,000 annually as out-of-pocket expenses, which would likely not be considered as a cheap investment for the majority of people in Bangladesh. There are some differences between public and private institutions. Students in public polytechnic would spend around 40 percent less than those in private polytechnics – mainly due to tuition fees. It is also worth noting that students in public polytechnics are far more likely to invest in private tutoring. Nearly half (46 percent) of public polytechnic students reported having spent at least some amount of money for private tutoring, whereas only a fraction of private polytechnic students (five percent) did so. This may be indicative of the need to compensate less the satisfactory quality of training at public institutions or to prepare themselves for higher education. Equally for both public and private students, costs for accommodation and transportation are a significant financial burden. More than half (around 63 percent) of the students are found to have paid for accommodation. This would be most relevant for students from rural areas, and by far the single largest expense item.

32. Tuition fee expenses vary considerably among students in private polytechnics depending on the technology of study. The annual average tuition fee expense incurred by polytechnic students are summarized in the table below (Table 2-2). By the nature of public institutions, tuition fees for public polytechnic students do not vary substantially across the technology of study. On the contrary, private institutions enjoy an autonomy in setting tuition rates, supposedly reflecting the actual costs of training services, as student tuition fees are the main source of financing for the majority of private providers. Technologies which involve the use of heavy machineries, tools and raw materials, such as Civil and Marine seem to have higher average tuition fee charges than others in private polytechnics. TVET courses are costly to establish. In other countries, there are cases where private training providers concentrate their course offerings on less costly technologies for quick profits, which would unnecessarily distort TVET market. It is, therefore, reassuring that in Bangladeshi polytechnics there are wide variations in tuition rates across technologies as that would allow private institutions to recuperate costs accordingly.

Table 2-2: Average amounts of annual tuition fee by institution type and technology

Technology	Tuition (BDT)	
	Private	Public
Architecture	11,055	4,400
Civil	22,331	3,567
Computer	21,907	3,423
Electrical	20,884	4,506
Electronics	21,049	4,690
Mechanical	16,940	3,815
Marine	23,445	-
Electro-Medical	-	4,129

Source: Polytechnic Tracer Study 2016

Table 2-1: Average annual out-of-pocket expenditures of polytechnic students

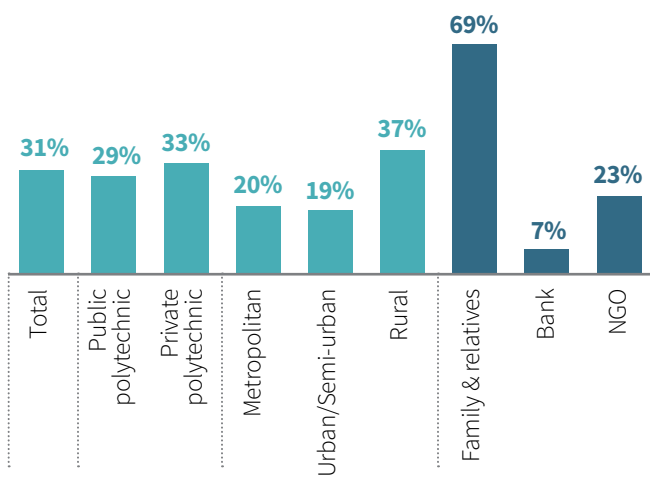
Institution Type	Annual Expenditure (BDT)					Total
	Tuition Fees	Textbooks	Transportation	Hostel	Private Tutoring	
Public	3,825	3,925	4,307 (6,263)	16,494 (25,998)	2,485 (5,378)	31,036
Private	20,871	4,398	7,472 (8,715)	17,110 (27,337)	209 (3,696)	50,060
All	11,256	4,131	5,687 (7,466)	16,763 (26,577)	1,493 (5,233)	39,330

Source: Polytechnic Tracer Study 2016

Note: Figures in brackets are the average expenditures after excluding those who did not incur any expenditure in those categories as these expenditures are conditional; expenditures covered here are not meant to be exhaustive, but give rough estimates for main expenditure items in polytechnic education; and figures are self-reported by students.

33. Polytechnic education is posing a substantial financial burden on families; a good number of polytechnic students, especially students from rural areas, are financing their education by taking out loans.

Around a third of the students have borrowed money to finance their studies at polytechnics (Figure 2-8). This indicates the presence of strong financial constraints regardless of the type of institution, and consequently points to potentially many hidden cases of academically deserving students giving up on polytechnic education due to their inability to pay. The borrowing relies heavily on informal family networks. Nearly 70 percent of those who have borrowed reported family and relatives as a main source of borrowing. Access to such informal lending sources are naturally not distributed equally, but rather influenced by the financial well-being of other family members and relatives. Only a handful were able to borrow from public and private banking institutions – a more formal source of financing. Bank loans are generally associated with lengthy formal procedures, high interest payment and collateral requirements. A more noticeable fact is that students from rural areas are significantly more likely to have to borrow money to pay for their polytechnic study, which may be due to greater accommodation and transportation costs and to their poorer financial endowment. The cumulative size of borrowing over the period of study appears to be quite significant. According to self-reported figures, polytechnic students and their families who have borrowed would likely end up in debt of around BDT100,000 by the end of their study. The average loan size for private polytechnic students is noticeably higher. Indebtedness at this level is no small burden for polytechnic graduates considering their employment prospects and expected wage levels.



Source: Polytechnic Tracer Study 2016

Figure 2-8: Share of students working part-time and borrowing and source of borrowing

Box 2: Financial aid program of STEP plays an important role in helping students to cope with financial challenges

Skills and Training Enhancement Project (STEP) has taken an initiative to alleviate the financial burden of polytechnic education for low-income families and female students. Around 56 percent of surveyed students are receiving stipend from STEP – all of the female students and nearly half of the male students. Male beneficiaries are determined through proxy means testing (PMT) to objectively measure the poverty levels of households. STEP’s stipend program is among the most generous programs as it gives students BDT800 per month. Although STEP’s stipend benefits fall far short of covering all the out-of-pocket expenditures, at least they would ensure that students get adequate supplies of learning materials. In the period from 2011 up to 2016, STEP granted stipend to around 145,000 polytechnic students.

Apart from STEP, around one-fifth of polytechnic students receive stipend from the government programs. Female students are found to be marginally more likely to receive such government stipend. Stipend beneficiaries of government programs are receiving an average monthly allowance of BDT380. Financial aid from other non-governmental sources seems much harder to come by and virtually unavailable. Less than one percent are getting stipends from non-governmental donors.

Source: Polytechnic Tracer Study 2016; STEP Semi-annual Progress Report, January-June 2016



Chapter 3

LABOR MARKET OUTCOMES OF POLYTECHNIC GRADUATES

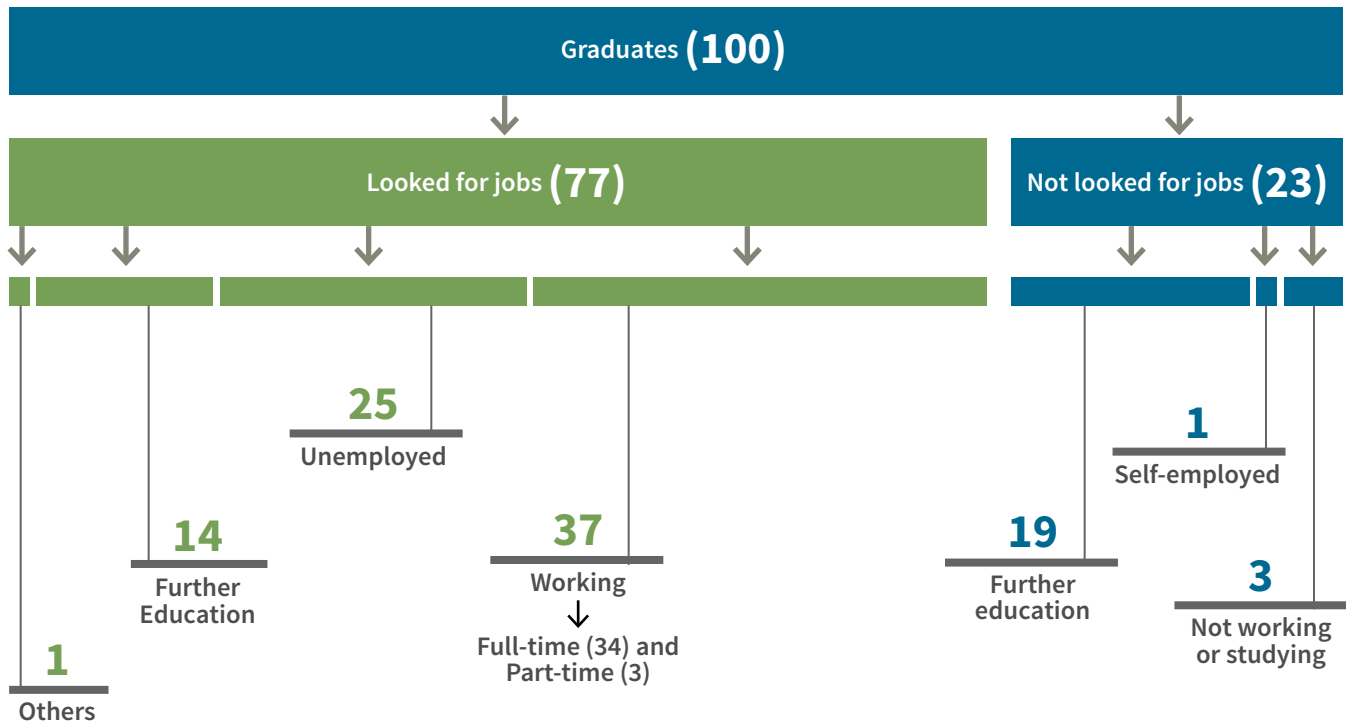
34. This chapter presents findings related to the economic outcomes of polytechnic graduates after one or two years of their graduation. It provides information not only about their employment status under wage employment and self-employment but also about graduates who are taking up further education and training in addition to their diploma degrees from polytechnics. The latter group of graduates is becoming increasingly relevant in skills development in the country because of the rising tendency among tertiary students of having prolonged post-secondary schooling to cope with highly competitive job markets and higher skills level required by employers.

3.1 EMPLOYMENT OUTCOMES

3.1.1 Overall analysis of employment outcomes

35. Overall, polytechnic graduates are found to be either employed (37 percent), unemployed (25 percent), or still in education and training (33 percent); self-employment (1 percent) and not being in labor force nor study (3 percent) are rare. The survey reveals there are three major economic outcomes of polytechnic graduates, which are: (i) employed full-time or part-time, (ii) unemployed, or (iii) studying full-time for further education and training. Overall distribution of graduates' employment outcomes is summarized in Figure 3-1. Around 37 percent of all the graduates are employed within one or two years of graduation, while 25 percent are still unemployed. A substantial proportion (33 percent) are still studying full-time. Very few (only five percent) are neither in training nor in the labor market – the status includes, for instance, being full-time housewives or being incapable to work for health reasons. Self-employment is also a rare job outcome for polytechnic graduates with only one percent being in self-employed businesses. Most of those who did not look for jobs moved on to further education and training. The subsequent sub-chapters will examine each economic outcome separately.

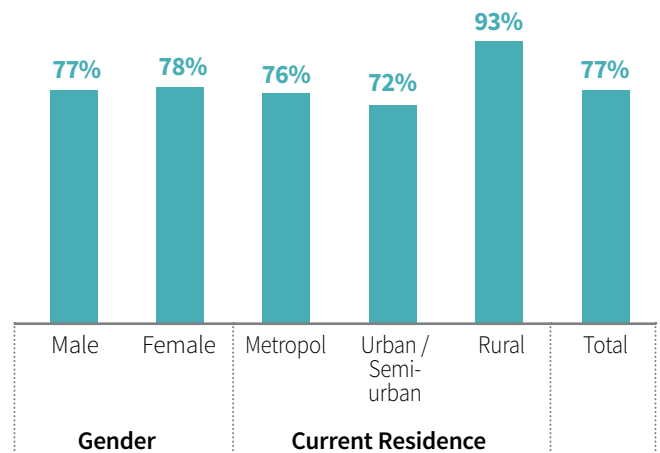
36. Labor force participation is high upon graduation from polytechnics - the large majority of polytechnic graduates, both male and female, seek jobs after completing their training. About 77 percent of graduates, both male and female, have responded



Source: Polytechnic Tracer Study 2016
 Note: The numbers in brackets show percentage shares against the entire graduate population

Figure 3-1: Overview of Current Status of Polytechnic Graduates

that they actually looked for work after graduating from their polytechnics (Figure 3-2). Graduates living in rural areas are even more likely to have looked for work after leaving polytechnics. Graduates from public and private polytechnics are found to be equally likely to have looked for work. This means that the great majority of students who come to polytechnics are doing so with an intention to go into the labor market with their newly acquired skills and diploma qualifications, and that skills training at polytechnics would have direct impacts on skill levels of young technical and engineering workers in the country. It is also important to stress that female polytechnic graduates are just as likely as their male counterparts to go directly into the labor market after graduation. Meanwhile, about a little over 20 percent of polytechnic graduates would not look for work after finishing the diploma courses. Most of them are currently pursuing further education and training. For them, polytechnic education was part of an academic career path leading to higher education that is alternative to going to higher secondary schools.



Source: Polytechnic Tracer Study 2016

Figure 3-2: Labor force participation among polytechnic graduates (proportion of graduates who looked for work after graduation), by gender and location

37. However, employment outcomes of polytechnic graduates are generally unsatisfactory with low employment and high incidence of unemployment.

Only around half (48 percent) of the graduates who looked for jobs would be working (either full-time or part-time) after one or two years of graduation²¹, while as much as a third of the graduates who looked for jobs would remain unemployed (Figure 3-3). Once unemployed, the situation may not look up very easily for them. The ratio of those with a job remain almost unchanged between the 2014 and 2013 cohorts (there is one year lapse between them). This clearly indicates a daunting prospect of prolonged joblessness and difficult school-to-work transition for many polytechnic graduates. Jobs do not seem to come to them easily despite holding diploma-level technical expertise. This prolonged joblessness also raises a serious question about the degradation of skills and technical knowledge of graduates, which further dampens their job prospects. On the other hand, differences in employment outcomes between graduates from public and private polytechnics appear to be insignificant.

38. Continuing studying seems to be a favored coping strategy for those who were not satisfied with job search outcomes.

Around 18 percent of the graduates who once looked for jobs eventually went back to full-time study in other institutions. Moreover, it is not rare that employed graduates quit the job and move on to another study. Around 10 percent of the graduates who were once employed left the job to enroll in further study (as a result, around 30 percent of the graduates currently studying had been employed earlier). Between the graduates of year 2014 and 2013, the share of those who are studying increased by 10 percentage points while that of the unemployed decreased by the same margin. This is likely because some of the unemployed graduates decide to attend

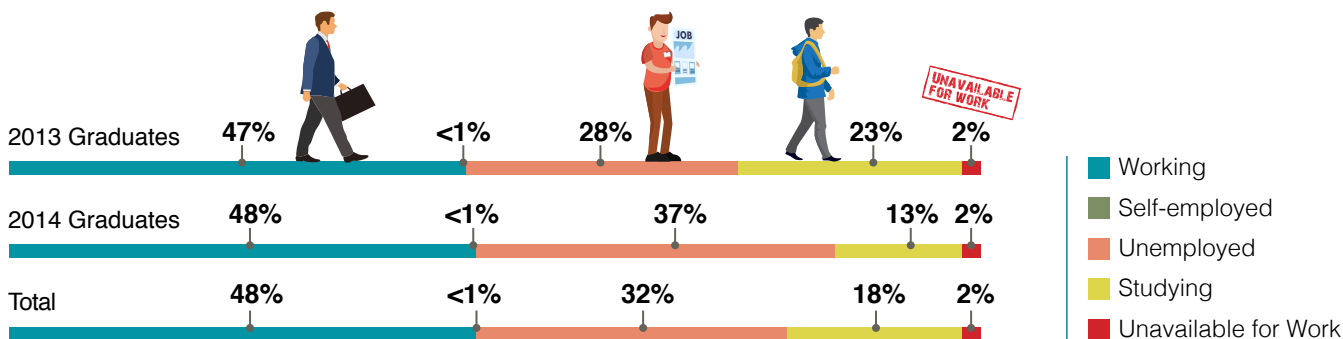
further education and training. Judging from these scenarios, further education and training seems to be a popular coping strategy for unsuccessful or unsatisfied job seekers who try to improve their job prospect or quality of employment by upgrading their qualifications.

39. The majority of the employed graduates have found first jobs within six to seven months of graduation, after which chances of finding jobs diminish quickly.

For those who could land a job, the job search period seldom extended far beyond half a year. By the end of the third month after graduation, around half of the would-be employed graduates would have found their first jobs (Figure 3-4). By the end of the seventh month, the share would go up to around 80 percent. It is evident that the longer it takes to find a job, the less likely it would be to find one. After passing one year since graduation, finding a job would become far less likely (at this point they would have to compete with polytechnic graduates of the next cohort). The job search strategy would need to be re-adjusted at that stage, perhaps by seeking additional upskilling training opportunities.

40. Disparities in the employment outcomes are glaring.

Female graduates are far more likely to be unemployed and out of study. Employment outlook seems quite bleak for many of the female polytechnic students. Compared with 49 percent of the male graduates being on the job, only 38 percent of female graduates are found to be working (Figure 3-5). For female graduates, a fallback option of further education and training seems also more limited. Only nine percent of the female graduates who looked for jobs are found to be studying full-time, whereas the share goes up to 19 percent for their male counterparts. As a result, a considerably greater proportion of female graduates are left unemployed in the job market. More



Source: Polytechnic Tracer Study 2016
 Note: Shares are among those who looked for jobs

Figure 3-3: Employment outcomes of graduates, by graduation year

²¹ This share of employed graduates is comparable to or worse than what TVET tracer studies in other countries have found. For instance, only 32% of all graduates from industry technical institutions in India are found to be employed within 12 months (Tan et al., 2007). This case is comparable to this study. In Sri Lanka, around 56% of TVET graduates were found to be employed (ADB, 2017), which is much more favorable than the employment outcome of Bangladeshi polytechnic graduates.

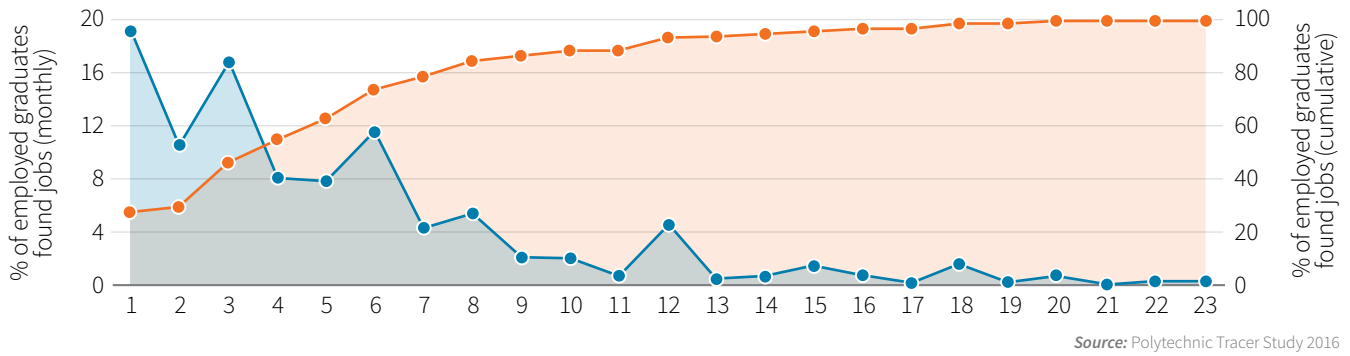


Figure 3-4: The number of months it took to find the first jobs among currently employed graduates

than half (52%) of the female graduates, who looked for jobs, remain jobless after one or two years of graduation, compared to 30 percent for males. This is an alarming figure for the TVET sector of Bangladesh which has been promoting diploma-level skills training for females.

41. In rural areas, the shares of those who are working or studying are substantially lower than those of metropolitan and urban areas. Only around 35 percent of graduates now living in rural areas are employed, which is more than 10-20 percentage points lower than those living in metropolitan and urban areas. Assuming the skills levels of graduates are not significantly different across locations of residence, this likely indicates a relative shortage of job opportunities in rural areas that demand diploma-level skilled workers. At the same time, opportunities for further education are not equal across geographical locations. Only a handful (seven percent) of graduates in rural areas are studying, as opposed to 26 percent and 13 percent of those living in metropolitan and urban areas doing so respectively. Consequently, unemployment is extremely high for graduates living in rural areas. As much as 57 percent of the graduates who looked for jobs and are currently living in rural areas remain jobless, compared to 25-30 percent in

metropolitan/urban areas. It appears that graduates who cannot afford or decide not to move to metropolitan/urban areas would have to face severely grim employment prospects.

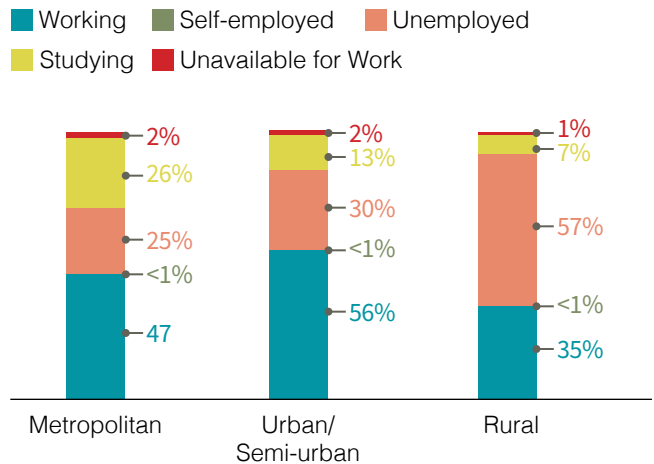
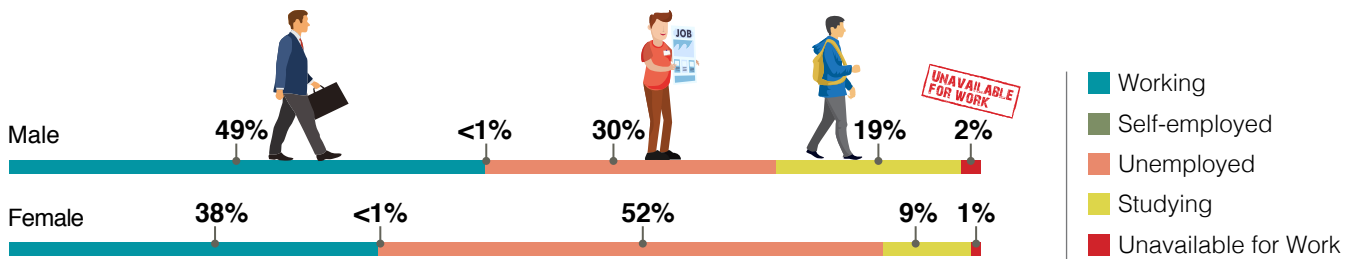


Figure 3-6: Employment outcomes of graduates, by current location of residence



Source: Polytechnic Tracer Study 2016
 Note: Shares are among those who looked for jobs; females account for 11% of entire graduates

Figure 3-5: Employment outcomes among job-seeking graduates by gender

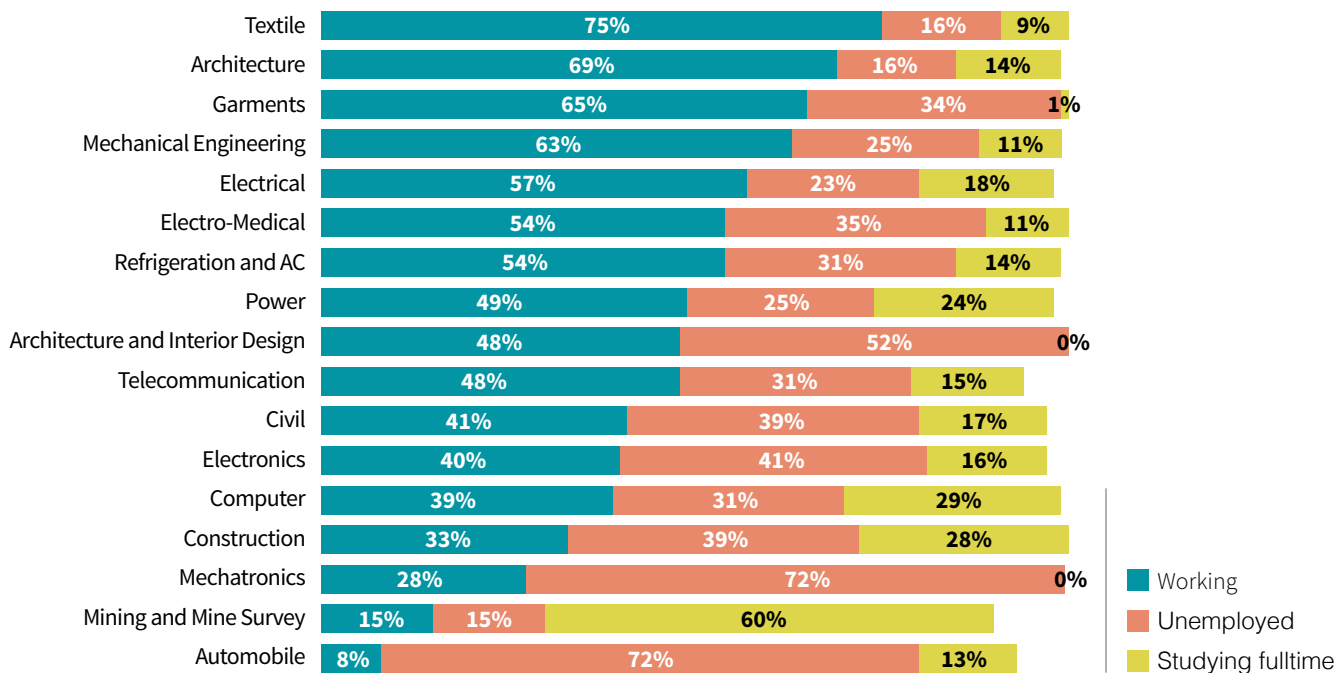
42. There are also considerable disparities in graduates’ employment outcomes across technologies. Among the technologies offered in polytechnics, some technologies such as Computer, Construction, or Automobile are not faring well in terms of finding employment (Figure 3-7). However, some of them also have high shares of graduates in further education and training. For instance, Power, Computer, Construction, and Mining Technology graduates are more likely to move on to further studies after failing in job search. Perhaps due to technological advances or higher job market competition, training at polytechnic alone may not be sufficient to find them relevant technical jobs. Some are faring much better in job market outcomes. As Bangladesh’s apparel manufacturing industry continues to thrive, graduates of Textiles and Garments Technologies seem to be having an easier time finding employment. Architecture, Electrical Technology and Mechanical Engineering Technology also seem to be performing better and have relatively strong performance in employment. The recent construction boom in Bangladesh may have contributed to better employment outcomes for students from those technologies. It is natural for different specialties to have different employment opportunities depending on the economic and industry needs. It would be extremely useful for the prospective students to have access to technology-wise employment tracking

information in order to make more informed decisions when choosing technologies to enroll.

3.1.2 Factors affecting the chance of employment for polytechnic graduates

43. Regressing employment outcome on various covariates demonstrates that the probability of employment is being influenced by several individual and institutional factors.

Controlling for other variables, female graduates are around eight percent less likely to be employed (See Table 3-1 for regressions results). Rural residence also significantly reduces the chance of employment by nearly 20 percent. Previous work experience may have some positive impact on the employment chance; however, as it is a rather rare property among graduates, statistical significance is weak. Interestingly, having an apprenticeship experience after graduating from polytechnic seems to have no impact on employment probability, though about a quarter of the graduates have such experience. Reasons are not immediately clear; however, it seems likely that many apprenticeship programs are not automatically linked with employment. Academic performance (as measured by CGPA score) at polytechnics seems to have some correlation with employment outcome especially for lowest performing groups. Graduating from public polytechnics would be associated with



Source: Polytechnic Tracer Study 2016
 Note: Shares are among those who looked for jobs; those in self-employment and unavailable for work are negligible and omitted from the chart; samples are not necessarily representative at the technology level.

Figure 3-7: Employment outcomes of graduates, by technologies of training

higher employment chances, though it is barely statistically significant. This is probably partly because public institutions tend to attract better performing students. The student-teacher ratio – one of the commonly used indicator for teaching quality – has nothing to do with employment outcomes.

44. Some of the institutions' job placement activities, such as graduate tracking and job search skills training, appear to be linked with positive employment outcomes. Polytechnics under STEP support are undertaking several job placement activities such as job fair and job skills trainings. One particularly noteworthy finding from the regression is the substantial positive impact of graduate tracking activity. Graduate tracking is one of the most fundamental elements of job placement support and gives institutions valuable feedbacks from the labor market and employers. Graduates from institutions which undertake graduate tracking (58 percent of the sampled institutions undertake graduate tracking) would increase employment probability

by as much as around 13 percent. Use of some of other job placement support services also appears to be associated with better employment outcomes. Job search skills training, which is one of the common activities of job placement unit, seems to improve employment chances. Having received job search skills training enhances the likelihood of being employed as much as around 10 percent, and the effect is stronger for males. Participation in job fairs and receiving vacancy information do not seem to increase employment chances significantly. To enhance the effectiveness of these activities, institutional capacity for organizing job fairs and exploring promising job vacancies may have to be strengthened. Taking counseling seems associated with negative effects. This is perhaps because counseling is often taken up by those who are struggling with finding jobs. Other support activities such as engaging industries and alumni for job placement (not reported in the figure below) were not found to have any significant impact on employment probabilities.

Table 3-1: Factors affecting likelihood of employment for polytechnic graduates

Dependent variable: Currently employed = 1	Probit with selection bias correction			
	Full sample		Male only	
<i>Individual characteristics</i>	dydx	Std. Err	Dydx	Std. Err
Female	-0.077*	0.041	-	
Age	0.015	0.009	0.016	0.010
Indigenous	-0.068	0.106	-0.092	0.104
<i>Residence</i>				
Urban/Semi-Urban	0.070**	0.031	0.089***	0.031
Rural	-0.208***	0.041	-0.182***	0.042
Work experience before polytechnic	0.132	0.085	0.146	0.094
Apprenticeship after polytechnic	0.032	0.034	0.025	0.034
<i>CGPA score (base: A+/A/A-)</i>				
B+/B	-0.052	0.033	-0.054	0.035
B- or less	-0.083*	0.041	-0.094**	0.042
<i>Institutional characteristics</i>				
Public polytechnic	0.088	0.052	0.095*	0.051
Student teacher ratio	-0.001	0.001	-0.001	0.001
Tracking service of graduates	0.131***	0.038	0.132***	0.039
<i>Use of placement support service</i>				
Job fair	0.009	0.050	0.008	0.051
Job vacancy information	0.047	0.036	0.031	0.039
Job search skills training	0.094*	0.045	0.114**	0.050
Counseling	-0.083*	0.045	-0.076*	0.044
Number of observations		1,995		1,785

Source: Polytechnic Tracer Study 2016

Note: (i) *** p < .01, ** p < .05, * p < .10; (ii) estimates are shown in marginal effects (i.e. changes in outcome probability with a unit change of the co-variate while keeping all other variables constant); (iii) estimates are controlled for graduation year and technologies; (iv) standard errors are accounted for multistage sampling, stratification, and finite sample; and (v) selection bias derived from individuals' self-selection into job search is corrected using Heckman correction.

3.2 WAGE EMPLOYMENT

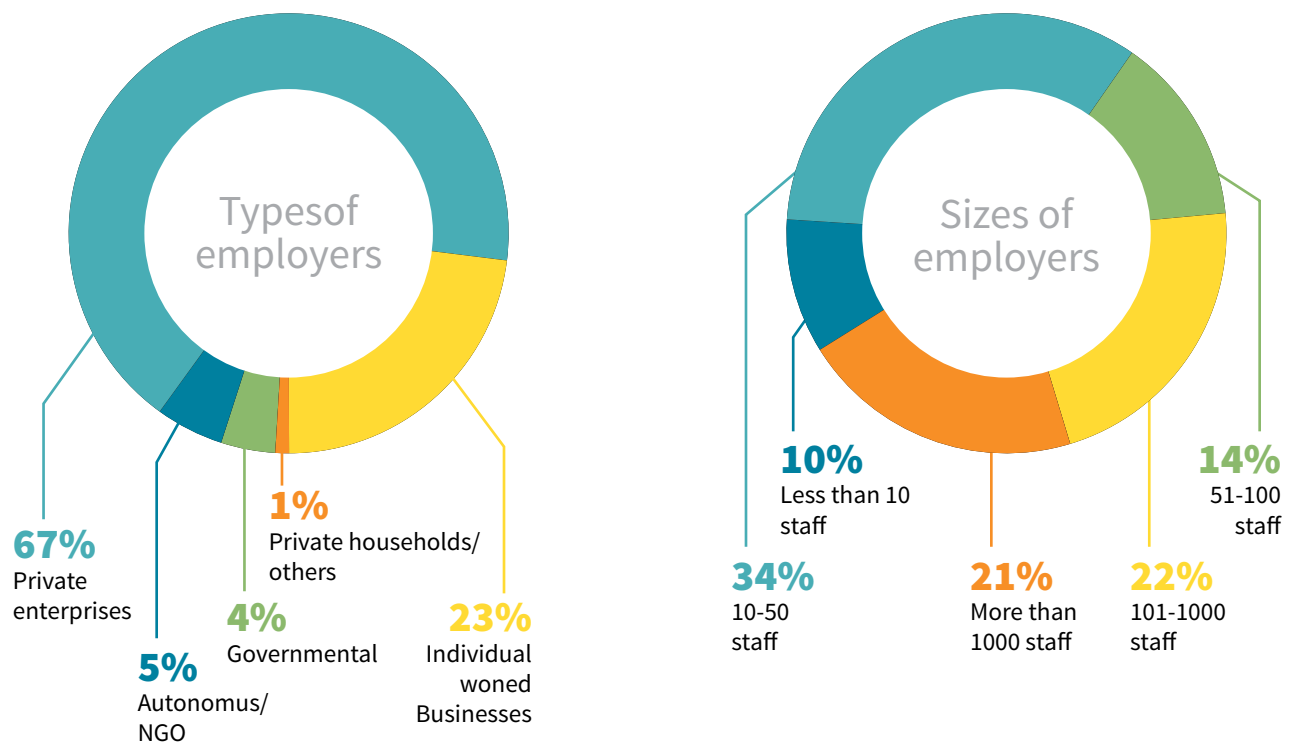
45. A little over a third of the polytechnic graduates are found to be employed either on full-time or part-time basis one or two years after graduation. This sub-chapter describes the characteristics and conditions of those employments for polytechnic graduates. Gender gaps and other disparities are also closely analyzed.

3.2.1 Job characteristics

46. The large majority of employers of polytechnic graduates are private enterprises or individually owned businesses; employment in government services is very rare. As much as 67 percent and 23 percent of the employed graduates are found to be employed by private enterprises and individually owned business, respectively (Figure 3-8). These are essentially business entities of different sizes in various industries in the private sector, collectively accounting for 90 percent of employment for polytechnic graduates. It is obvious from this finding that former students from polytechnics are a valuable source of skilled manpower for small and medium size enterprises in the economy. On the contrary, public sector employment, including both central and local ones, account for only a fraction (four percent) of employment for polytechnic graduates. The types of employers are not significantly different between male and female graduates. Public sector employment is equally rare for females as well.

47. Small enterprises employ about half of the polytechnic graduates. According to the definition of Bangladesh Bank, industries which employ less than 50 staff can be considered as small enterprises. It is found that around 44 percent of the graduates are employed in such small enterprises. This is nothing surprising in a country such as Bangladesh where, according to Bangladesh Bureau of Statistics, Small and Medium-size Enterprises account for 90 percent of all private enterprises and employ about 70 – 80 percent of non-agricultural workforce. Women are somewhat more inclined towards employment in small companies. Around 60 percent of the employed female graduates found jobs in businesses with less than 50 staff. Graduates from public polytechnics are somewhat more likely to find jobs in government entities, while graduates from private institutions are more likely to be working in individually owned businesses.

48. Manufacturing and construction businesses are the largest employers of polytechnic graduates; females are more concentrated towards a few industries. In total, around 30 percent of the employed graduates are found to be working in the manufacturing sector, followed by 15 percent working in the construction sector (Table 3-2). It is a positive sign that many polytechnic students would find jobs in these thriving industries of the countries, leveraging the skills they acquired in polytechnics. ICT industry is another emerging and booming industry in Bangladesh, which now employs around seven percent of the graduates coming out of polytechnics. There are some gaps in



Source: Polytechnic Tracer Study 2016

Figure 3-8: Types and sizes of employers of polytechnic graduates who are currently working

the patterns of employing industries between male and female graduates. Naturally the construction sector employs fewer females. The education sector, where they are hired as instructors and trainers, is the largest employer for female graduates, employing about a third of the employed female graduates. ICT industry is also a popular choice for female graduates where 14 percent of the employed female graduates are working.

Table 3-2: Industries of polytechnic graduates who are currently working

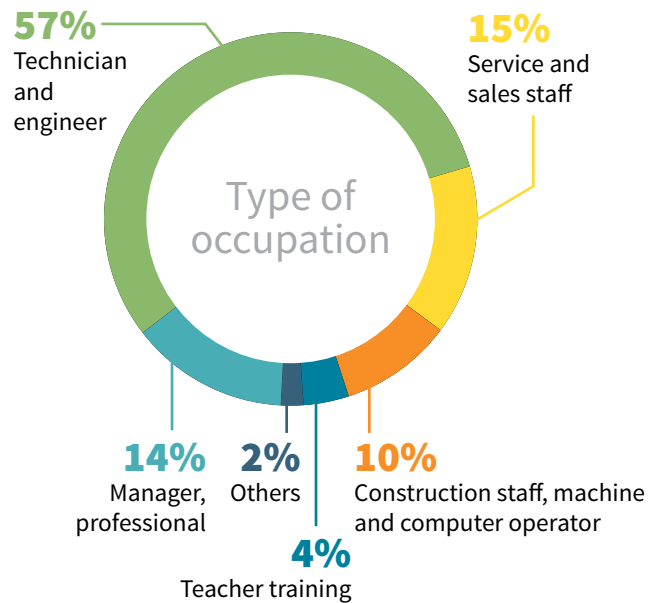
Industries	All	By Gender	
		Male	Female
1. Manufacturing	29%	29%	24%
2. Construction	15%	16%	6%
3. Education	11%	9%	32%
4. Electricity, gas, air conditioning supply	10%	10%	1%
5. ICT	7%	6%	14%
6. Other services	6%	5%	6%
7. Scientific & technical activities	5%	5%	3%
8. Whole sale, retail, motor vehicle repairs	3%	3%	3%
9. Health & social works	3%	4%	0%
10. Real estate	3%	3%	2%
11. Other industries	8%	8%	9%
Total	100%	100%	100%

Source: Polytechnic Tracer Study 2016

49. The majority of employed polytechnic graduates are working as technical experts in various industries. More than half of the employed graduates describe themselves as working as technicians and engineers, and 14 percent describe themselves as managers and professionals (Figure 3-9). Combined, around 70 percent of the employed graduates are hired to do technical and engineering jobs, which polytechnic education is designed to cater to. Construction and machine/computer operators are also another common occupation for them where 10 percent of the employed graduates are working.

50. Many of the employed graduates seem to enjoy sound job security with permanent full-time contracts; however, females are less likely to be in permanent full-time jobs.

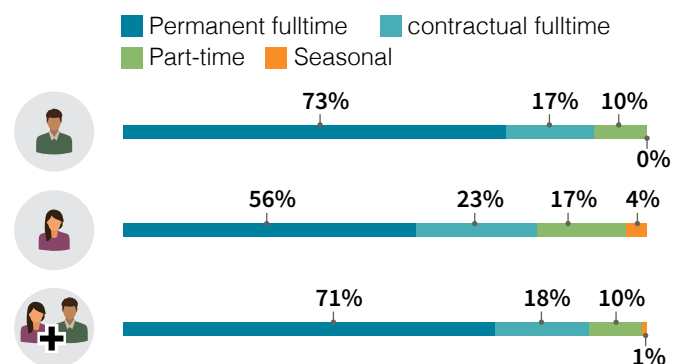
According to OECD²², the quality of jobs has three dimensions: (i) job security; (ii) earnings; and (iii) working environment. Overall, around 70 percent of the employed graduates are hired under permanent full-time employment arrangement, while



Source: Polytechnic Tracer Study 2016

Figure 3-9: Occupation types of polytechnic graduates who are currently working

others are in contractual full-time employment (18 percent), part-time employment (10 percent), and seasonal employment (one percent) (Figure 3-10). Female graduates seem to enjoy less job security as a greater proportion of them are in unstable employment than males. This may not necessarily mean that female graduates are suffering more from job insecurity since some of them may have sought more flexible contractual arrangements. It also has a lot to do with the selection of industries. Industries with higher female concentration, particularly education, have a significantly higher ratio of workers with unstable contracts²³.



Source: Polytechnic Tracer Study 2016

Figure 3-10: Employment contract types among employed polytechnic graduates, by gender

²² Job quality framework defined by OECD: <http://www.oecd.org/employment/job-quality.htm>

²³ It is not immediately clear why graduates working in the education sector tend to have less secure job contracts; however, anecdotal evidence suggests that training institutions sometimes engage in the practice of hiring their unemployed graduates as short-term assistants. This allows institutions to alleviate chronic teacher shortage at a low cost.

3.2.2 Wages

51. On average, polytechnic graduates had a starting salary of around BDT 9,200, and are earning the average current monthly income of around BDT 10,800 – the level overall comparable to the national averages. Table 3-3 below shows the average monthly wage incomes of polytechnic graduates by different categories.

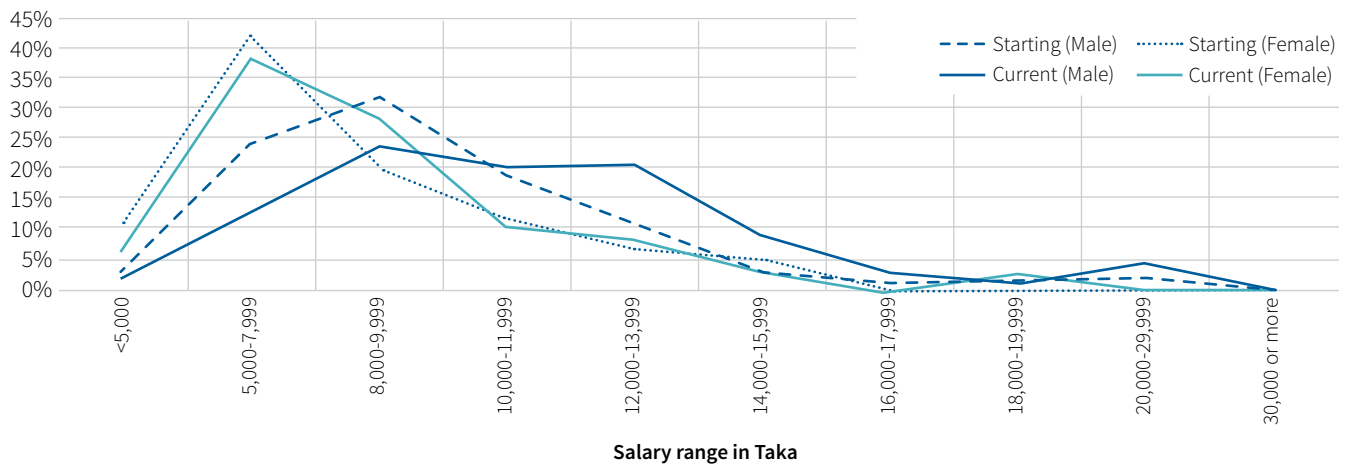
Comparisons with the Bangladesh Labor Force Survey (LFS) 2013 report suggest that polytechnic graduates are enjoying salary levels that are more or less comparable to, or possibly only slightly lower than, the national averages of the similar age groups. For instance, in 2013, the employed workforce aged between 20 and 24 were on average making BDT11,308. Incomes may differ by occupation and education qualifications. According to the Enterprise-based Skills Survey (ESS) 2013, the average starting salary for technicians and associate professionals was around BDT7,800, and that for TVET qualification holders was around BDT6,900 in 2012. Considering the inflation, the earnings of polytechnic graduates would be by and large equal to these national averages for people with the similar age, occupation, and education qualifications.

52. Income disparities are observed along the lines of contract type, location, and industry. Type of contract is one of the most significant factors for determining salary levels for polytechnic graduates. Having a permanent full-time contract is on average associated with higher salaries for both males and females. Geographical difference also plays a substantial role. Graduates in rural areas are not only disadvantaged in terms of employment opportunities, but also they are earning considerably less than their peers in metropolitan and urban areas. Rural graduates are, on simple average, earning around 20 percent less than their metropolitan or urban peers. In rural areas, gender wage gaps are even more pronounced. Furthermore, it seems that some of the industries are also associated with higher salary levels. For instance, jobs in manufacturing, electricity, and health sectors seem to bring salaries that are on average higher than jobs in other sectors. Working in manufacturing, electricity, and health sectors increases monthly salary moderately compared to working in other sectors. Education industry seems to have lower salary.

Table 3-3: Factors affecting likelihood of employment for polytechnic graduates

	Current Salary (BDT)			
	All	Male	Female	GPI ²⁴
All	10,843	11,088	8,308	0.75
By Contract Type				0.010
Permanent Full-time	11,301	11,439	9,449	0.83
Non-permanent Full-time	9,713	10,157	6,865	0.68
By Location				0.031
Metropolitan	11,122	11,280	9,657	0.86
Urban/Semi-urban	11,066	11,345	7,404	0.65
Rural	8,751	9,204	5,217	0.57
By Industry				
Manufacturing	11,754	11,990	8,799	0.73
Construction	10,925	11,004	8,904	0.81
Education	7,626	7,887	6,851	0.87
Electricity, gas, air conditioning supply	12,018	-	-	
ICT	10,465	10,940	8,368	0.76
Whole sale, retail, motor vehicle repairs	10,030	-	-	
Health & social works	12,202	-	-	
Real estate	9,470	-	-	

²⁴ Gender Parity Index (GPI) is calculated as the figure for females divided by the figure for males. GPI below 1 indicates females underperforming males, and GPI above 1 indicates females outperforming males.



Source: Polytechnic Tracer Study 2016

Figure 3-11: Distribution of starting and current salary, by gender

53. Gender wage gaps are significant against females, especially among those who are not full-time permanent employees, and females appear slower in getting a pay raise.

Overall, on average, female graduates are earning only around 75 percent of what their male peers would be earning (Table 3-3). However, the income gap shrinks significantly, though still persistent, if they are employed on permanent full-time contracts. On simple average, females are earning 83 percent of what their male counterparts would be earning. This is more or less consistent with the finding of the Labour Force Survey 2013 which shows the average salary of females in the technician occupation as 20 percent lower than of males in the same category. Female graduates in rural areas appear to be at a significant disadvantage vis-à-vis their male counterparts as their average monthly earning is 43 percent lower²⁵. Across industries, gender earning gaps seem to be consistent. In addition, by looking at the difference between starting and current wages, it is noticeable that wages increase more rapidly for male graduates (Figure 3-11).

3.2.3 Factors affecting the wage levels among polytechnic graduates

54. Wage regression analysis reveals that employed graduates' wage levels are affected by a range of factors, particularly gender, contract type, and firm size; and poor skills acquisition may have a negative consequence on wages. After controlling for other variables, being female decreases the average monthly salary by around 21 percent (see in next page Table 3-4 for the regression outputs). Full-time permanent contract increases the wage level by about six

percent; however, the impact of having full-time permanent contract on wage is much more significant for females. Females having full-time permanent contract would increase wage by about 25 percent relative to those without. Educational and previous work experience factors seem to have little to do with wages. Having work experience or an HSC certificate before being in polytechnics, or having done apprenticeship and additional training after coming out of polytechnics are not significantly correlated with wages. Interestingly, poorly acquired skills, as demonstrated by having very low CGPA, seem to be negatively affecting wages. Having poor CGPA of lower than B- (18 percent of graduates fall under this category) decreases wages by around 12 percent. Job search methods also seem to impact how much graduates are earning. Relying on personal networks, a common way to find jobs in Bangladesh, would reduce wages by around seven percent. Also, those who land a job soon after graduation tend to earn better. An extra month spent for job search after graduation is associated with two percent decrease in wages. Firm size matters too. Larger firms do tend to pay better wages, and the differences are substantial. Compared to small firms with less than 10 employees, firms with more than 51 staff and with more than 101 staff pay around 19 percent and 25 percent more, respectively. This large disparity across firms may explain why many graduates continue their job search in a hope to find a better employment in well-established firms. Rural residence reduces the average salary by about 10 percent relative to metropolitan residence. Public polytechnic graduates seem to be earning less (around 15 percent); however, this should be interpreted with caution as the sample includes only good performing private polytechnics.

²⁵ This figure is based on a small sample and should be interpreted with caution. There are only six samples that fall into this category of employed females in rural area.

Table 3-4: Wage regressions for polytechnic graduates

	Current Salary (BDT)			
	Full sample		Male only	
<i>Individual characteristics</i>	Coef.	Std. Err	Coef.	Std. Err
Age	0.204	0.162	0.237	0.176
Age square	-0.004	0.004	-0.005	0.004
Gender (Female)	-0.233**	0.082	-	-
Contract type				
Full-time contract	0.062**	0.028	0.068**	0.028
Full-time contract * Female	0.228**	0.098	-	-
Education and work experience				
Work experience before polytechnic	-0.095	0.079	-0.096	0.078
Additional training after polytechnic	-0.061	0.040	-0.064	0.042
Apprenticeship after polytechnic	-0.017	0.028	-0.006	0.028
Holding HSC certificate	0.067	0.063	0.091	0.071
CGPA score (base: A+/A/A-)				
B+/B	-0.046	0.031	-0.041	0.033
B- or less	-0.127**	0.045	-0.118**	0.046
Job search experience				
Method of finding the job (base: Open adverts)				
Personal networks	-0.078***	0.026	-0.079***	0.027
Other channels	-0.022	0.050	0.009	0.055
No of months took to find the employment	-0.019***	0.003	-0.019***	0.003
Firm characteristics				
Company size (base: Less than 10 employees)				
11-50 staff	0.114**	0.051	0.088	0.052
51-100 staff	0.178***	0.057	0.130**	0.056
101-1000	0.228***	0.058	0.189***	0.056
more than 1000	0.310***	0.058	0.277***	0.058
Location				
Residence				
Urban/Semi-Urban	0.035	0.030	0.045	0.031
Rural	-0.097**	0.046	-0.101*	0.050
Institutional characteristics				
Public polytechnic	-0.166***	0.032	-0.167***	0.034
Constant	7.207***	1.868	6.870***	2.017
Number of observations		1,885		1,785

Source: Polytechnic Tracer Study 2016

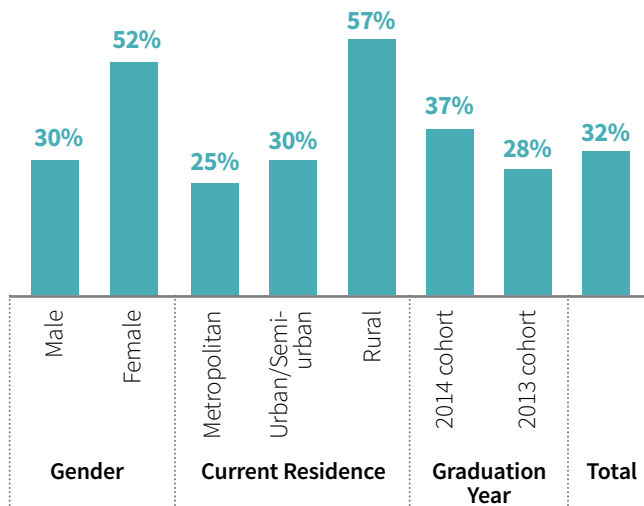
Note: (i) *** p < .01, ** p < .05, * p < .10; (ii) estimates are also controlled for graduation year, industry types, occupation types, regions, and work hours; (iii) standard errors are accounted for multistage sampling, stratification, and finite sample; and (iv) selection bias derived from individuals' self-selection into employment is corrected using Heckman correction.

3.3 UNEMPLOYMENT

55. It is clear from the discussion in the previous section that unemployment is a serious issue that haunts many polytechnic students, and long-term unemployment is a widespread phenomenon for this demographic group.

This section shows the finding related to the situation of unemployment among polytechnic graduates.

56. The unemployment rate for polytechnic graduates averages at 32 percent, and is considerably higher for female graduates and graduates living in rural areas. Calculated as per the definition of this report (i.e., labor force participation defined as those who looked for work after graduation), the overall unemployment rate for polytechnic graduates at one or two years after graduation stands at 32 percent (Figure 3-12). The rate is far higher for female graduates, standing at 52 percent, a substantial gender gap of more than 20 percentage points. One of the reasons that female unemployment rate is so high is because a smaller proportion of females continue with further education compared to male graduates. The unemployment rate is even higher at 57 percent among graduates living in rural areas.

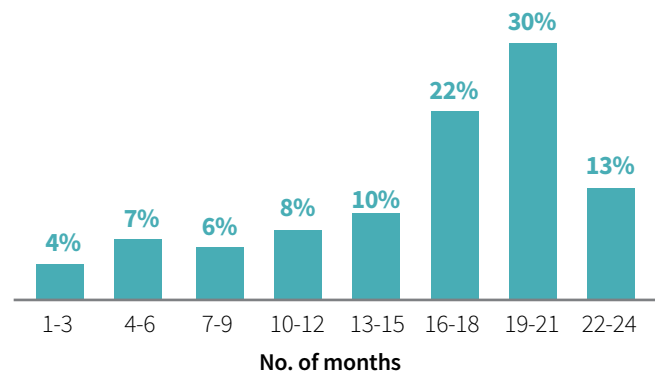


Source: Polytechnic Tracer Study 2016

Figure 3-12: Unemployment rates of polytechnic graduates, by gender, current residence, year

57. Long spells of joblessness are a common feature of unemployment among polytechnic graduates for both male and female graduates. The large majority – around 75 percent of the unemployed who graduated in 2013 (roughly two years before the time of data collection) – has reported having been unemployed for more than 12 months (Figure 3-13). As a matter of fact, most of them have never been under employment since

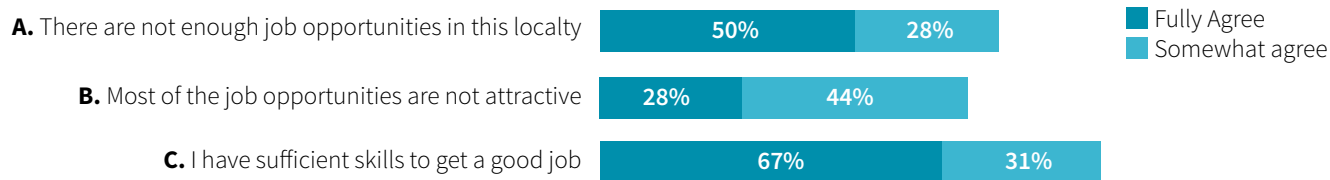
they left the polytechnics. It was reported that only around 13 percent of the unemployed graduates of the 2013 cohorts have ever been employed in the past. The lengths of unemployment periods seem more or less similar for both male and female unemployed graduates, with females experiencing slightly longer periods of unemployment. On average, female unemployed graduates of the 2013 cohort have been jobless for 17.7 months, whereas their male peers have been so for 15.7 months. However, as discussed earlier, males are more likely to be in further education and training, thus more often concealing their actual unemployment status.



Source: Polytechnic Tracer Study 2016

Figure 3-13: Length of unemployment period among the unemployed who graduated two years ago

58. Most of the unemployed graduates are hoping to find full-time administrative or technical staff positions; however, there seem to be significant mismatches between what polytechnic graduates desire and what are available in the job market. Naturally, almost all the unemployed respondents have indicated that they are hoping to find jobs that are full-time and either of administrative or technical designations. While they have been unable to find such suitable employment, more than a third – around 37 percent – of the unemployed graduates have reported that they received at least one job offer previously, but ended up turning them down for various reasons, including low salary, poor work conditions of the offered job, inconvenient location of workplace, and not being related to the areas of their trained expertise. They seem rather picky about the kind of jobs they would take. Moreover, they also seem to be selective when responding to job advertisements. Around 70 percent of the unemployed graduates are found to have filed only 10 job applications or less despite having been unemployed for more than a year. These probably indicate widespread mismatches between the kind of jobs that are available and that are desired by polytechnic graduates.



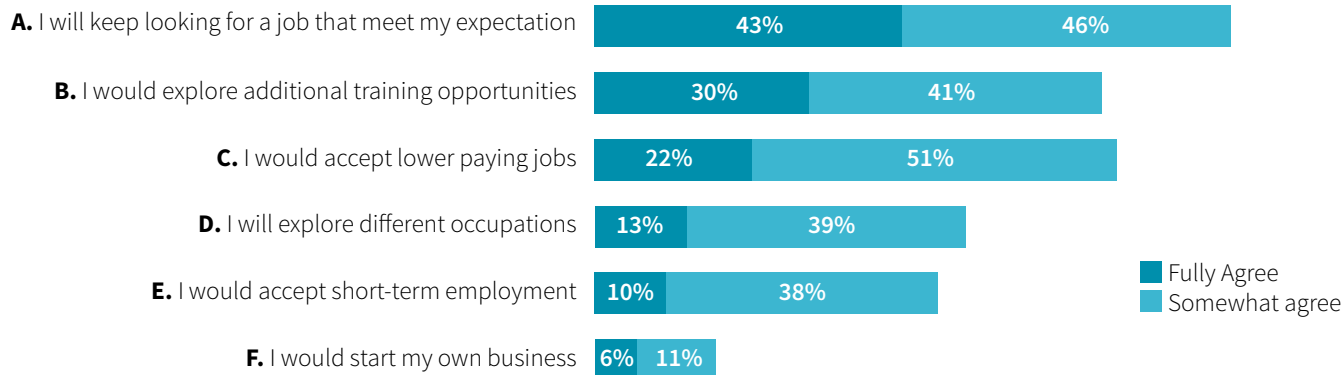
Source: Polytechnic Tracer Study 2016

Figure 3-14: Perception about job opportunities among the unemployed graduates

59. It is found that many of the unemployed are dissatisfied about the quantity of job opportunities that are available in their localities and are unhappy about the quality of available job opportunities. Seventy-eight percent of the unemployed respondents agree that there are not enough job opportunities out there in their locality (Figure 3-14). This ratio jumps to 88 percent among the unemployed respondents residing in rural areas, indicating further acute shortage of job opportunities for highly trained technicians in rural areas. It is apparent that the scarcity of job opportunities is one of the biggest concerns of polytechnic graduates. When asked about the quality of available job opportunities, more than 70 percent of them agree that most of the job opportunities are not attractive for them, suggesting that the few job opportunities that may be available are often not the kind of jobs that require high-level technical expertise for which they have been trained. Meanwhile, almost all the unemployed graduates (98 percent) believe that they have sufficient skills to find a good job. These gaps between the perceived adequacy of skills and the quantity and quality of available job opportunities would certainly lead to a strong sense of frustration and deprivation among the polytechnic graduates.

60. Graduates seem less flexible in terms of strategies for finding jobs - most of them would continue searching for jobs that would meet their expectations and are ready to explore

additional training opportunities; however, they are not keen to accept lower paying jobs, and very few would be willing to explore self-employment opportunities. Almost 90 percent of the unemployed graduates reported that they would continue looking for jobs that meet their expectations. At the same time, facing the reality of difficult job search, 73 percent of them agreed that they would accept jobs that pay less than what they want. Another strategy to enhance the chance of employment is to have additional trainings. More than 70 percent of the unemployed graduates agreed that they would explore additional training opportunities if there are any good ones available. On the other hand, certain strategies such as looking for jobs in different occupations and accepting short-term employments are less favored, indicating their strong adherence to trained specialties and preference of long-term stable employment. Even less favored, by a considerable margin, is an option to start their own business (i.e. self-employment). Only 17 percent of the unemployed graduates agreed that they would explore starting their own business. Self-employment seems to be an utterly disfavored idea among polytechnic graduates. This, however, is at odd with the job market reality in Bangladesh especially in rural corners where a significant part of labor force is working in the informal sector where small-scale enterprises and self-employed businesses are widespread.



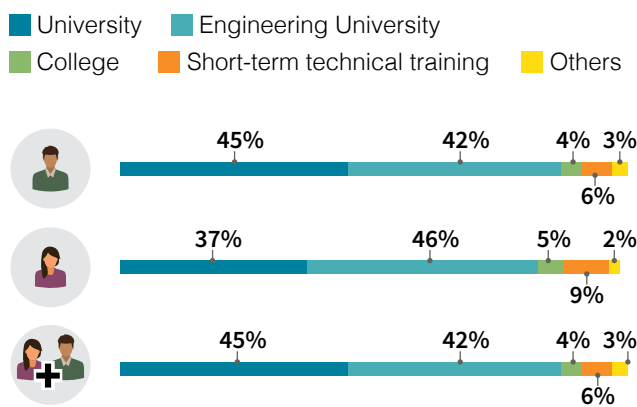
Source: Polytechnic Tracer Study 2016

Figure 3-15: Strategies for job search among the unemployed graduates

3.4 FURTHER EDUCATION AND TRAINING

61. Faced with an unfriendly labor market for polytechnic graduates or attracted by the advantages of higher education qualifications, many of the polytechnic graduates opt for further education and training after the graduation, moving up to the ladder of the tertiary education system. After spending four years of technical training, about a third would choose to pursue further education and training. This sub-chapter will provide more details about the further education and training that polytechnic graduates are moving on to.

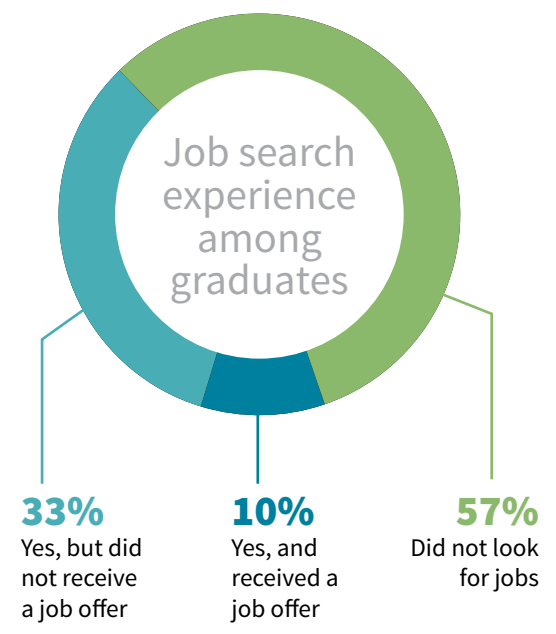
62. **The majority of the graduates who are still in full-time study are enrolled in universities, showing a strong demand for higher education qualifications among students in polytechnics.** Overall, universities account for 87 percent of education institutions where polytechnic graduates are studying full-time after one or two years of graduation (Figure 3-16). This in itself is not surprising as Bachelor's degree would be the next logical step for Diploma holders. Most of the polytechnic students enter polytechnics with an SSC degree only, and upon graduation, as Diploma holders, polytechnic graduates are eligible to apply for universities. Polytechnics give students in TVET tracks an important pathway to go on to higher education and subsequently towards better paid jobs with higher-order skills requirement. Nearly half of those who moved up to universities are enrolled in an engineering university. Dhaka University of Engineering and Technology appears to be playing a large role in meeting the higher education demands of polytechnic graduates. There are no significant differences between male and female graduates except that a slightly smaller share of female graduates is enrolled in general universities. Engineering universities are equally popular for females and males.



Source: Polytechnic Tracer Study 2016

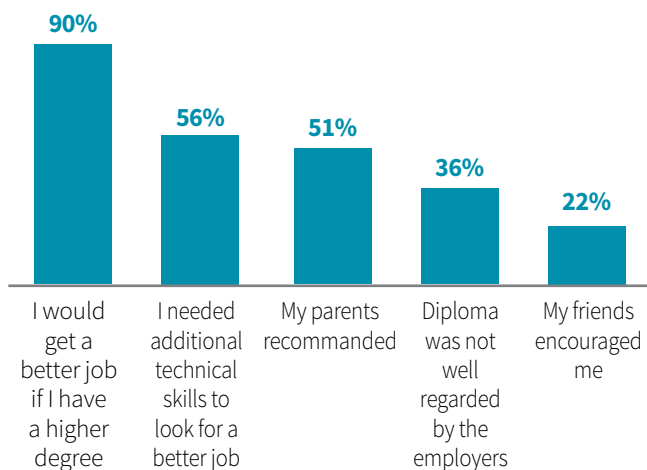
Figure 3-16: Institutions where polytechnic graduates are currently enrolled for fulltime studies

63. However, some seem to have pursued higher education because of their disappointing job market outcomes, in a hope that higher education would pave the way to better job outcomes. Among those who are currently studying full-time, 57 percent of them moved on to further education without even trying to look for jobs first while the remaining 43 percent are those who attempted to find jobs after graduation and were probably left dissatisfied and discouraged by the poor job market outcomes (Figure 3-17). Many of them were unable to secure employment; however, there are even some who received job offers but declined them to be enrolled in higher education. There seems to be a strong belief that higher education qualification would lead to better employment. Ninety percent of graduates in full-time studies think they would get better jobs if they have a higher education degree (see in next page Figure 3-18). A number of them also think that they would need to further enhance their technical knowledge and skill levels if they are to get good employment they are hoping for. Perhaps they might be hoping for engineer/technician posts at managerial levels which are often occupied by higher education degree holders. Parents' expectations and recommendations also seem to play a major role in deciding graduates' course of action regarding continuing education. Fifty percent of those who are studying full-time are encouraged by parents to continue studies.



Source: Polytechnic Tracer Study 2016

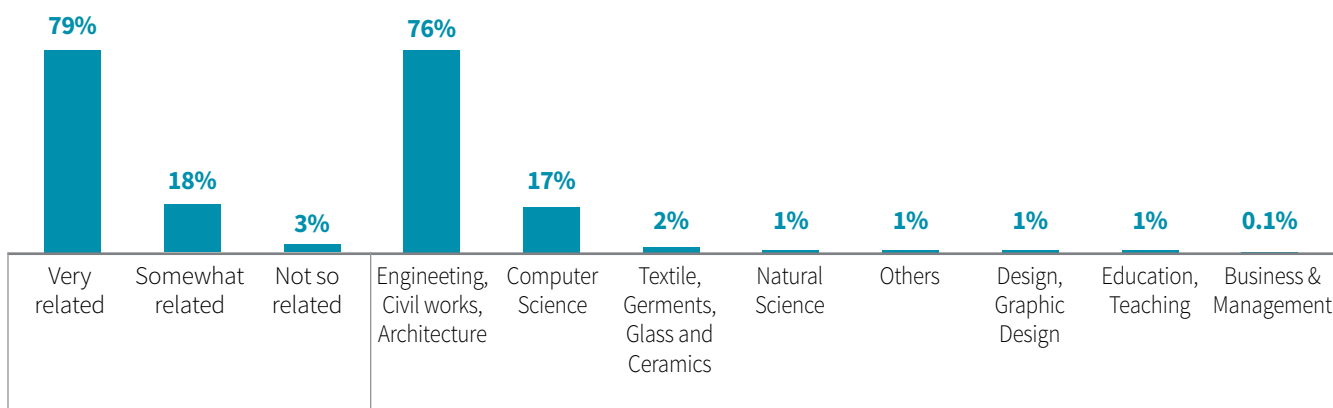
Figure 3-17: Job search experience among graduates in full-time study



Source: Polytechnic Tracer Study 2016

Figure 3-18: Motivations for pursuing further education among graduates in full-time study

64. Most of the graduates appear to be deepening their expertise in the areas that are relevant to their training at polytechnics; the knowledge and skills gained in polytechnics are not wasted. Seventy-nine percent of those who are currently studying full-time think the areas of their current studies are highly related to what they have studied in polytechnics. Another 18 percent of them think it is moderately related (Figure 3-19). This clearly demonstrates that polytechnic graduates are studying further for higher or additional qualifications by building on the technical knowledge and skills that they have acquired through trainings at polytechnics. Further study and training beyond polytechnic are, for most of polytechnic graduates, not an opportunity for a career change



Source: Polytechnic Tracer Study 2016

Figure 3-19: Areas of further education and training among polytechnic graduates

away from technical fields but rather an important avenue for career development as technical specialists. In terms of areas of study, regardless of whether it is general university or engineering university, the overwhelming majority are concentrated in disciplines related to engineering, civil works, and architecture (76 percent) which are specializations that are typically of technical background, and in disciplines related to computer science (17 percent) which is also a popular discipline in polytechnics. Very few are studying in other disciplines such as business and management and social sciences that are highly popular among the general population of university students.

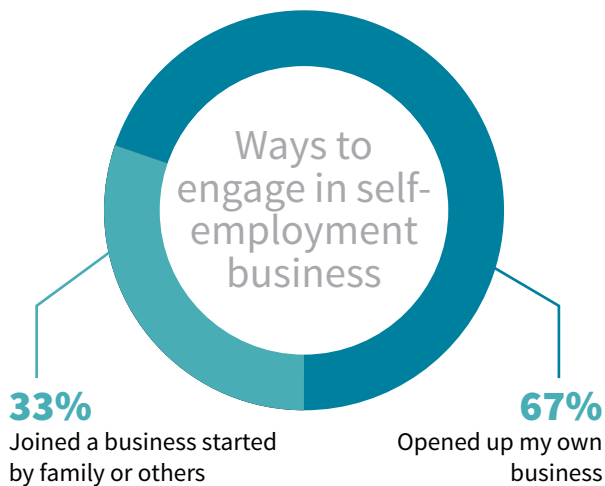
3.5 SELF-EMPLOYMENT

65. Despite the government policy to promote self-employment, it seems to remain as an unpopular or unfeasible job option for most of the polytechnic graduates. Self-employment is defined as business operations where individuals work for themselves and derive their income directly from their customers and clients instead of working for someone else and receiving wages from them. It is also a mode of occupation for entrepreneurs and business owners/co-owners who employ other people. The government has been keen on promoting entrepreneurship among youths in order to invigorate the local economies and employment and to reduce youth unemployment. Only a small proportion (one percent) of the graduates, however, are found to be self-employed²⁶. This ratio is lower than among graduates of short-term (six-month) technical training programs, of whom around four percent were found to be self-employed after six months of completion of the training²⁷.

²⁶ Due to the small number of incidence of self-employment in the sample, the findings of this self-employment section may be biased and need to be interpreted with caution.

²⁷ According to World Bank. (2014). How Does the Short-Term Training Program Contribute to Skills Development in Bangladesh?: A Tracer Study of the Short-Term Training Graduates. Washington D.C.

66. In terms of the mode of self-employment, the majority of self-employed graduates start out their own business, while others join business operations that were established by others, typically by other family members. Sixty-seven percent of the self-employed reported having set up their own businesses, while the remaining 33 percent reported having joined self-employment business operations that are already established by family members or other individuals (Figure 3-20). Those who start up their own business typically do so without any partners – three quarters of them are found to have started up their business on their own. The areas of business are quite diverse, and the most common business areas include (1) wholesale, retail trade, and repair of motor vehicles; (2) manufacturing; and (3) construction.

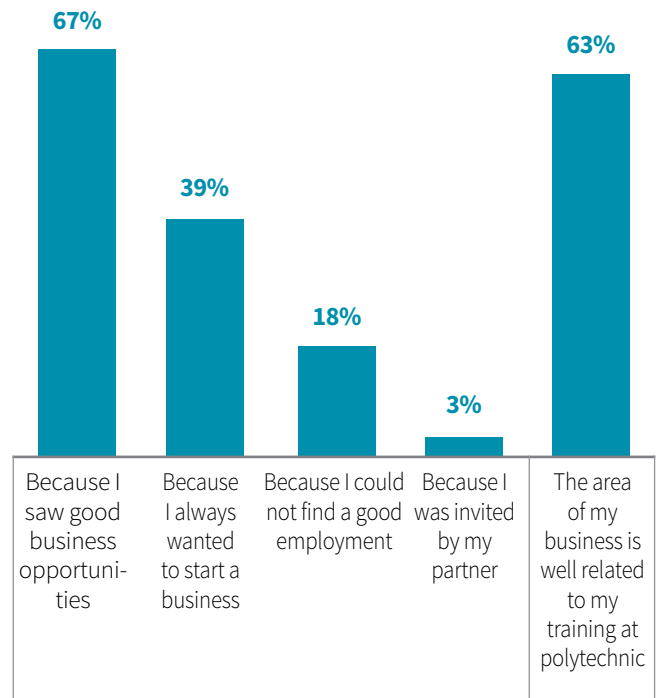


Source: Polytechnic Tracer Study 2016

Figure 3-20: Ways to engage in self-employment business operations among polytechnic graduates

67. Identification of business opportunity and aspiration for entrepreneurship are the drivers of self-employment; and skills acquired from polytechnics are put to work for self-employed businesses. Sixty-seven percent of those who started up their businesses did so because they saw good business opportunities, while 39 percent of them did so because they always had an aspiration of becoming an entrepreneur someday (Figure 3-21). Those who turned to self-employment because of failing to find good employment are rather minority – only 18 percent of those who started businesses did so because they could not find good employment. Again, this confirms the earlier finding about the lack of interchangeability between wage employment and self-employment job options for polytechnic graduates. Furthermore, among those who are in self-employment, more than half (63 percent) of them are doing business in the areas which are well related to their

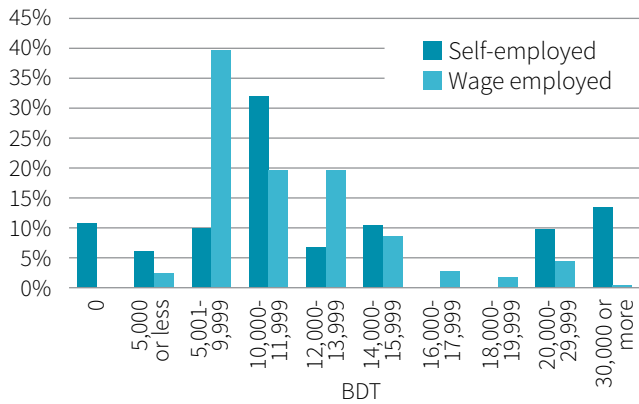
areas of training at polytechnics (Figure 3-23). This shows that education and training at polytechnics are probably technically capable to train and prepare students for self-employment and entrepreneurship if students are willing to do so and can identify business opportunities.



Source: Polytechnic Tracer Study 2016

Figure 3-21: Motivation regarding self-employment among polytechnic graduates

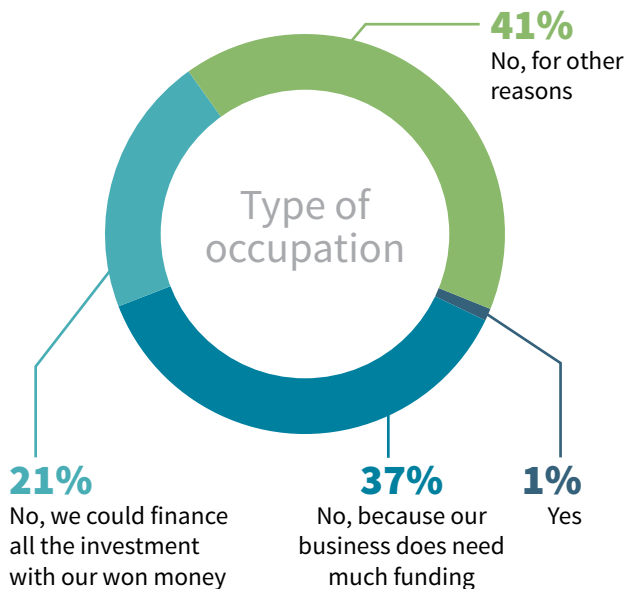
68. On average, self-employed graduates appear to be earning more income than wage-employed ones, but they are also running much higher risks – one of the main discouragements against self-employment. The average monthly personal income (not business revenue) for self-employed graduates was found to be around BDT17,000, which is around 57% higher than the average current salary of wage-employed graduates. However, self-employment incomes vary much more widely. Average variation from the mean value (i.e., standard deviation) is nearly three times larger for self-employed graduates. In the income distribution, there are around 13 percent of self-employed graduates who are making BDT30,000 or more per month; however, it is nearly impossible for wage-earning graduates to make that much income. At the other end of the spectrum, there are some self-employed graduates who are making zero or less than BDT5,000 of income per month (see in next page Figure 3-22). Such high-risk nature of self-employment is probably one of the main reasons for the unpopularity of self-employment among polytechnic graduates.



Source: Polytechnic Tracer Study 2016

Figure 3-22: Distribution of monthly income for self-employed and wage employed graduates

69. The lack of access to financial resources is often cited as one of the challenges for entrepreneurs in Bangladesh, and this seems to be the case for polytechnic graduate entrepreneurs as well. Almost no one has received external funding from anywhere when starting up their businesses (Figure 3-23). It is not immediately clear whether the graduates have attempted borrowing money from any lending institutions or solicited investment from investors as more than half of the self-employed graduates say that they did not need external funding to start their business. However, it seems clear from the fact that no one borrows or receives external funding that those small self-employment businesses owned by polytechnic graduates are generally out of reach of the banking system and investment funding both from the supply and demand sides.

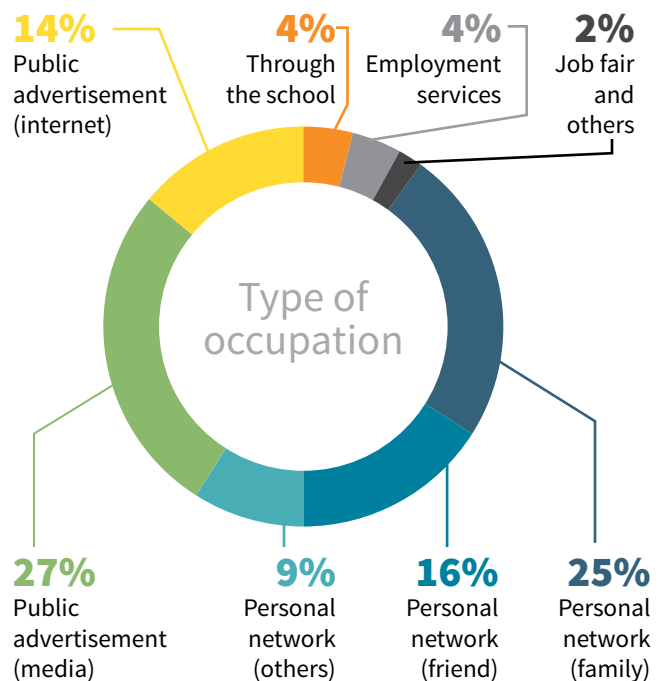


Source: Polytechnic Tracer Study 2016

Figure 3-23: Whether or not business start-ups among graduates received external funding

3.6 JOB SEARCH STRATEGIES

70. As is frequently the case in the Bangladesh society, informal personal networks play a vital role in the job search activities of polytechnic graduates. Figure 3-24 shows the kinds of job information channels that the employed graduates relied on in order to find the job they are working for now. Half of them found the current job through their personal networks of family and relatives, friends, and other relations. This approach would include cases such as getting informal referrals to potential employers, getting employed by companies or divisions managed by family friends, finding posts in companies where one's friends are also working, etc. Looking for job opportunities through the web of personal and family connections appears to be the surest way for polytechnic graduates to actually land on a job. The most common approaches for job application is to respond to vacancies advertised on the print media and internet. About 80 percent of the polytechnic graduates who have looked for jobs have experiences of applying for job vacancies posted on newspapers or internet websites. Job opportunities advertised publicly are open for everyone and competitive, and success rates of such applications may not be high. Around 40 percent of the employed graduates found jobs through media or internet advertisement. It is also noteworthy to take note of the role of internet for job search. Considering its low-cost nature and flexibility, recruitment through internet may well become another main method of recruitment in near future.



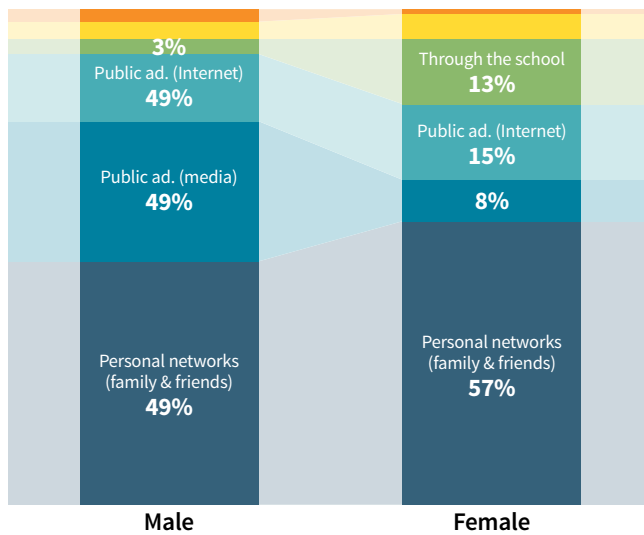
Source: Polytechnic Tracer Study 2016

Note: These are methods through which graduates have managed to find a job.

Figure 3-24: Methods of finding employment among employed polytechnic graduates

71. Female graduates tend to rely more on school support as well as on informal personal networks for job search.

Informal personal networks seem to play even a larger role for female graduates, accounting for 57 percent of successful job hunting cases (Figure 3-25). This may be a result of general concerns of their families about the safety of their daughters. They would want to see them employed by someone whom they know. Public advertisement on newspapers, on the other hand, account for a far smaller proportion (eight percent) of successful job placement for female graduates. It is probably rare for technician jobs for females, which are not that many to start with, to be advertised on newspapers. The internet job postings are probably more associated with job opportunities in ICT related



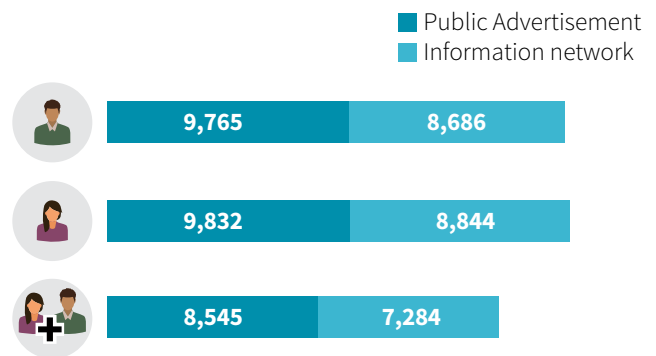
Source: Polytechnic Tracer Study 2016

Figure 3-25: Methods of finding employment for polytechnic graduates, by gender

companies that tend to be more female-friendly workplaces. One distinctive difference is the role of polytechnic institutions. While very few of male graduates land on jobs through the institution's support, a substantial proportion (13 percent) of female graduates do so. Since job opportunities for females are limited in technical fields, polytechnics may be making extra efforts to secure job openings for their graduates through establishing networks with interested employers.

72. Graduates who found jobs through informal personal networks tend to start with lower starting salaries than peers who got employed through public advertisements.

For both genders finding jobs through applying job vacancies on public advertisement seems to be linked with higher starting salaries (Figure 3-26). The difference is statistically significant and seems quite substantial as discussed earlier. Fiercer competitions and chances of vetting candidates in the open selection process in public job advertisements would probably give employers greater confidence about the skills of recruits, hence giving them higher starting salaries.



Source: Polytechnic Tracer Study 2016

Figure 3-26: Starting salaries of polytechnic graduates by means of finding the job (in BDT)



Chapter 4

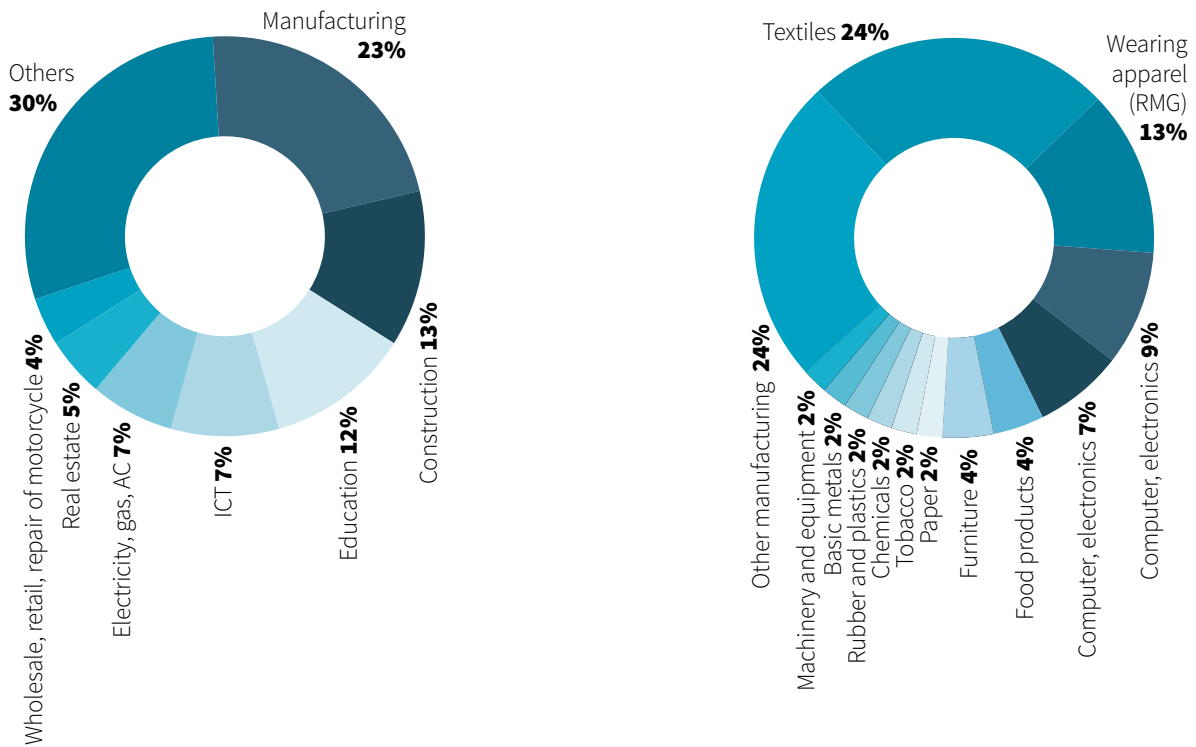
EMPLOYERS' PERSPECTIVES ON POLYTECHNICS AND POLYTECHNIC GRADUATES

73. How do employers view the level of training at polytechnics and what are their expectations for polytechnics and their graduates? To improve the employability of trainees and skills matching with market needs would require extensive communication and collaboration between training providers and employers, which has proven to be a challenging issue. This chapter discusses employment and skills of polytechnic graduates and training services of polytechnics from the perspective of their employers. It should be noted here that employers' feedbacks on graduates may have some upward selection bias. It is reasonable to think that those who are employed are systematically better skilled than those who are not, and hence employers' assessment of them do not necessarily reflect the overall skills quality of polytechnic graduates.

4.1 CHARACTERISTICS OF EMPLOYERS' HIRING POLYTECHNIC GRADUATES

74. Employers of polytechnic graduates are more concentrated towards five main industries, namely Manufacturing, Construction, Education, ICT, and Electricity & Air Conditioning. The industries of the employers of polytechnic graduates are described in Figure 4-1. Manufacturing accounts for around a quarter of employers of polytechnics, while in the overall economy 30 percent of all the workers are engaged in the manufacturing sector²⁸. Entities of Construction, ICT, and Electricity & AC industries are hugely overrepresented among the employers of polytechnic graduates; these industries respectively accounted for only 0.2 percent, 0.4 percent, and 0.2 percent of all the workers in the economy as of 2013. Within the entities in the manufacturing sector, textile industry and ready-made garment (RMG) industry account for by far the largest share, together accounting for more than a third (37 percent) of the manufacturer employers. This high share of garment industry reflects the trend in the economy as a while where a little over 50 percent of manufacturing jobs are in the garment sector. Furthermore, the majority of the employers of polytechnic

²⁸ According to the Economic Census 2013, published by Bangladesh Bureau of Statistics (BBS).



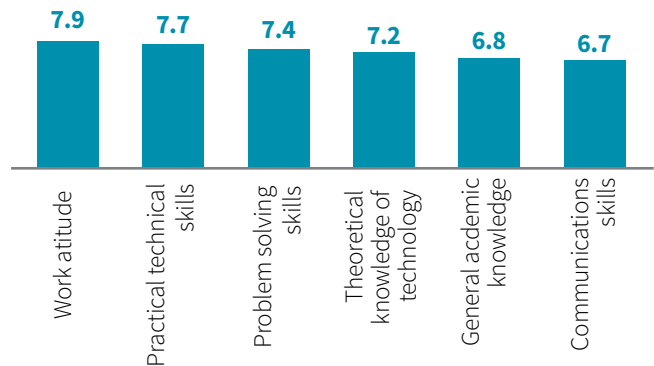
Source: Polytechnic Tracer Study 2016
Note: n=200

Figure 4-1: Industries of employers of polytechnic graduates

graduates appear to be in the formal sector. As much as 93 percent of them claim to have an official registration number from the government.

4.2 SKILLS PERFORMANCE OF POLYTECHNIC GRADUATES

75. Graduates of polytechnics seem to be seen by employers as having good work attitude and strong practical technical skills, while somewhat weaker in communication skills. The survey asked the employers of polytechnic graduates to rate the strength of polytechnic graduates in different skills areas. As shown in Figure 4-2, work attitude is rated most favorably as a strength of polytechnic graduates, followed by practical technical

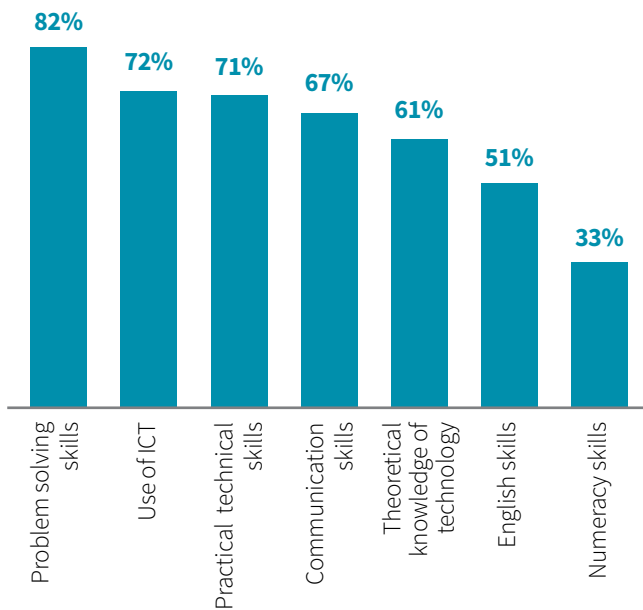


Source: Polytechnic Tracer Study 2016
Note: the averages of responses rating in 10 point scale in each category of skills where 10 stands for very strong and 1 means very weak; n=200

Figure 4-2: Employers' assessment of level of strength of polytechnic graduates in different skill sets

skills which is rated almost equally high. Meanwhile, it appears that theoretical knowledge is seen as less of a strength of polytechnic graduates. This high rating of practical skills relative to theoretical ones is rather contrary to our expectation and also can be taken as a positive sign especially since overemphasis/overreliance on theoretical trainings instead of practical ones at polytechnics and other TVET institutions have often been singled out as a major challenge for the skills development sector. It might be the case that, thanks to deliberate efforts at various levels for enhanced practical trainings, the situation may have improved gradually at some of the polytechnics, and students are now graduating with more practical knowledge and skills. Problem-solving skills are also rated relatively high. Communication skills seem to be generally seen as a weakness of polytechnic graduates.

76. Employers want polytechnics to take steps to strengthen trainings on problem-solving skills, along with ICT skills and practical technical skills. Nearly all of the interviewed employers (over 80 percent) think polytechnics should enhance training on problem-solving skills (Figure 4-3). Problem-solving skills are essential especially for professionals who have to deal with and deliver solutions to complex technical problems and business challenges. Given today's accelerated pace of technological changes and integration in globalized business environment, high-level cognitive skills such as this will continue to be in high demand. The survey responses show that



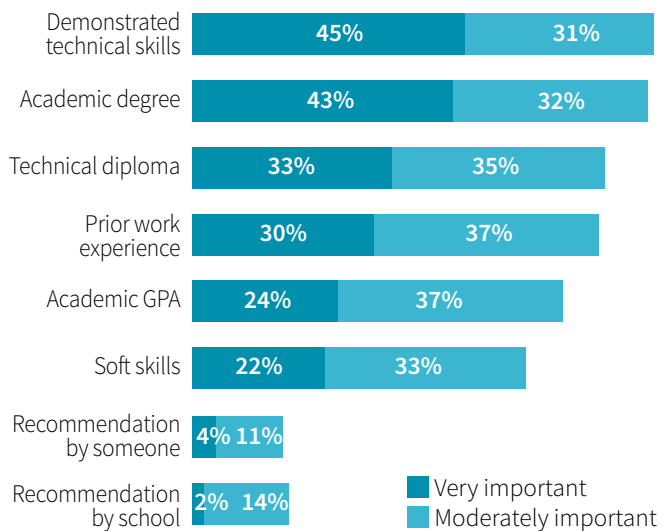
Source: Polytechnic Tracer Study 2016
Note: n=200

Figure 4-3: Employers' view on skills in which polytechnics should train their students more

employers are keen to see polytechnics teach and train students with teaching methodologies that can nurture creative problem-solving skills. Many employers (more than 70 percent) also want to see strengthening of training for use of ICT as well as practical technical skills. Communication skill is also seen by many employers as a skill area needing more strengthening probably because they also see it as one of the weaknesses of polytechnic students.

4.3 MOTIVATION OF HIRING POLYTECHNIC GRADUATES

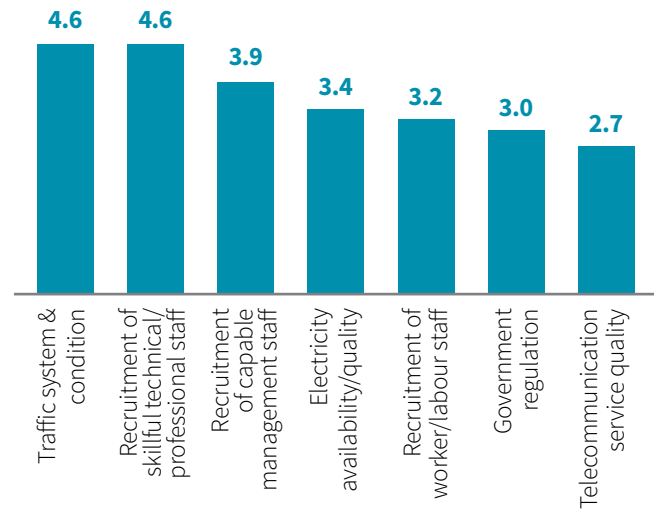
77. Demonstrated technical skills are deemed the most important quality that employers seek when hiring junior staff, followed by education qualifications such as academic degrees and technical degrees. Employers of polytechnic graduates were asked about how much they pay attention to different characteristics and qualifications of candidates when making decisions about hiring young new staff (Figure 4-4). Rather surprisingly, soft skills (communication skills, etc.) – often considered to be one of the key factors that characterize high-performing workers – are not given as much importance as technical skills and education qualifications. Employers in business areas where polytechnic graduates are typically employed seem to want to hire, first and foremost, technically sound workers, even if they may have to compromise on soft skill aspects.



Source: Polytechnic Tracer Study 2016
Note: n=200

Figure 4-4: Level of importance of various factors in hiring young new staff

78. Recruitment of skillful technical and professional staff seem to pose a big challenge for many employers in technically oriented business areas – the gap that polytechnics could do more to fill. When asked to rate the degree of various challenges, employers, on average, rated recruitment of skillful technicians and professionals as one of the most pressing problems for their companies, and seem to see it almost equally challenging as the notorious traffic system and conditions of Bangladesh and considerably more problematic than the issue of quality of electricity which is often cited as discouraging investments in the country (Figure 4-5). Recruitment of capable management staff is rated somewhat less difficult, and recruitment of worker or laborer level staff is rated even less problematic. It is evident that, at least among employers in business areas where polytechnic graduates are demanded, there still is a great deal of unmet demand for highly skilled technical and professional manpower in Bangladesh.



Source: Polytechnic Tracer Study 2016

Note: The averages of responses rating in 10 point scale in each category of challenges where 10 stands for a very big problem and 1 is not at all a problem; n=200.

Figure 4-5: Degree of difficulties or different problems to the employers' business



Chapter 5

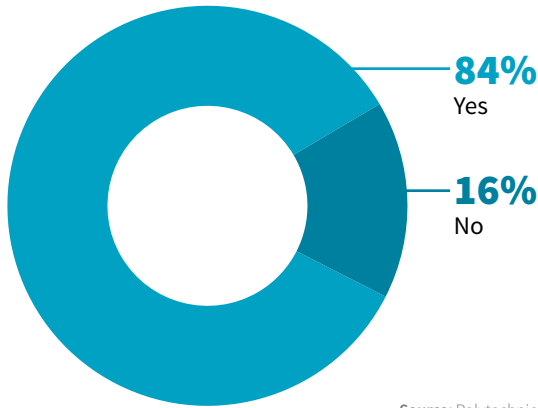
ANALYSIS ON INSTITUTIONAL CAPACITY OF POLYTECHNICS

79. The study obtained institutional information from the sampled polytechnics and interviewed the principals of polytechnics to probe the current situations surrounding job placement and teaching and learning at the institution level. This chapter provides the findings from the institution-level information covering job placement services, industry collaboration, and teaching force.

5.1 JOB PLACEMENT SERVICES

80. Most of the surveyed polytechnics have job placement cells. No significant difference between public and private polytechnics is observed. This is a sea change from the traditional view about the role of polytechnics' services for students where it was restricted to the provision of training services. Having established a job placement cell does not automatically mean that polytechnics are now able to provide adequate and effective job placement services. As discussed in the chapter of graduates, only around 36 percent of graduates reported having benefited from job placement services of their polytechnic. Considering that most of the polytechnics have only recently begun to provide job placement services, there still is a plenty of room for improvement and strengthening until polytechnics have come to establish fully operational job placement cells. Most of the polytechnics seem to have started a journey towards that direction.

81. Students are not yet fully aware of job placement support service by their institutions; private polytechnics are far more active in helping students in their job search. Figure 5-2 shows the ratios of graduates who were supported by job placement services in polytechnics, and also reasons for not availing themselves of the services in case they did not receive support. Clearly, private polytechnics are taking the job placement services much more seriously. Sixty-three percent of private polytechnic graduates reported having received the service from their institutions. The situation is quite the contrary in public polytechnics where only a little less than a quarter of graduate said they benefited from the service. This should not come as surprising as private entities would naturally have more stakes in ensuring the best possible employment outcomes for their students. It should

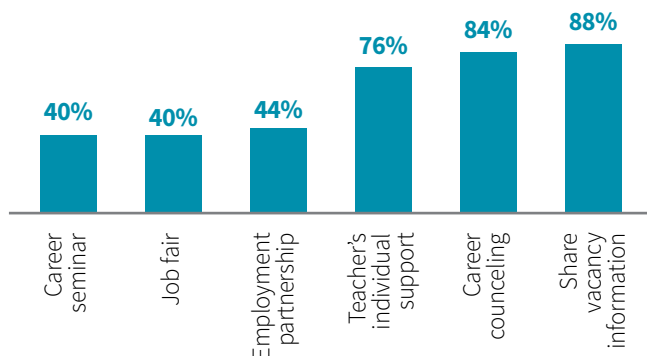


Source: Polytechnic Tracer Study 2016
Note: n=200

Figure 5-1: Existence of job placement cells among sampled polytechnics

also be noted that among those who did not benefit from job placement services, as much as 40 percent did not know whether or not their institutions had any job placement services available for students. It is more than possible that some of them simply missed out on the available opportunities without knowing it.

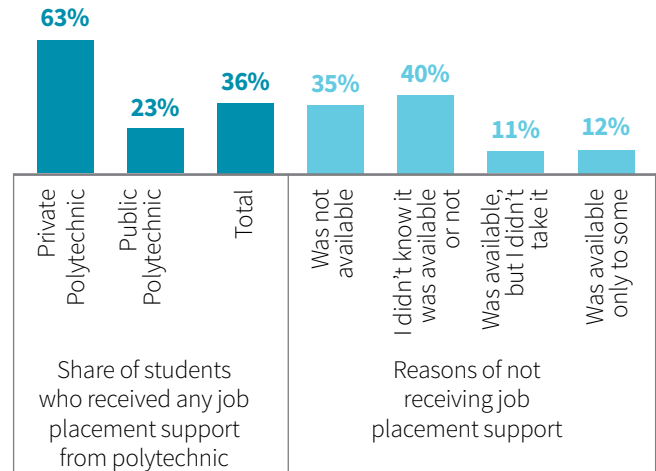
82. Many polytechnics are yet to start full-fledged job placement services; the most common types of job placement services offered by the polytechnics are individual-based. Figure 5-3 presents the types of job placement support services available to students based on the polytechnics' responses and students' responses. Most widely available services include career counseling and teachers' advisory services, both of which are individual-level counseling services in principle. These services are relatively of low-cost nature and readily implementable within the existing operational



Source: Polytechnic Tracer Study 2016

Note: Among institutions that reported having job placement services, and among graduates who have utilized job placement services; n=25 for institutions' responses.

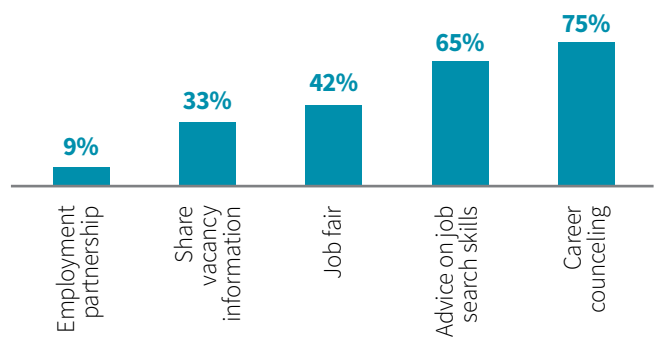
Figure 5-3: Types of job placement services provided to students



Source: Polytechnic Tracer Study 2016
Note: n=25

Figure 5-2: Share of students who received placement support and reasons for not receiving it

arrangement of polytechnics. On the other hand, another important and more institution-based job placement support such as employment partnership and organizing seminars or fairs appears yet to be fully implemented. Only a handful of students reported having used this service. Again, private polytechnics seem to be more frequently offering those costly employment services. For instance, 60 percent of the surveyed private polytechnics conduct job fairs while only 27 percent of the public ones do so. Sixty percent of the private polytechnics claim to have preferential employment partnership with industries whereas 33 percent of the public institutions have said they have such partnership.



83. Providing job opportunity information to students is one of the commonly performed functions of job placement services by polytechnics; however, the sources of job information are yet to be systematically exploited. Regarding the main channel through which they gather information related to job opportunity information for students, 60 percent of the polytechnics have said that they rely on personal networks of head teachers and teachers (Figure 5-4). Such informal personal networks would allow them to tap into less competitive insider job vacancy information; however, as a downside, there would be a limitation on how extensively polytechnics would be able to capture job opportunity information. Obtaining vacancy information from partner industries seems to be another common way to consolidate job opportunity information for students. If polytechnics are to enrich their job placement services, gathering and supplying extensive and timely job opportunity information are essential. Polytechnics may well consider establishing more systematic approaches to collecting job opportunity information from industries.

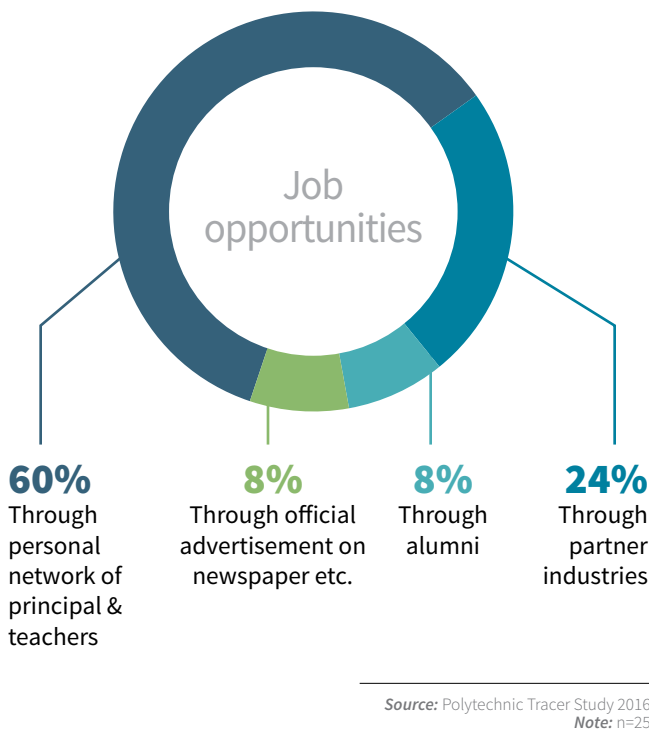
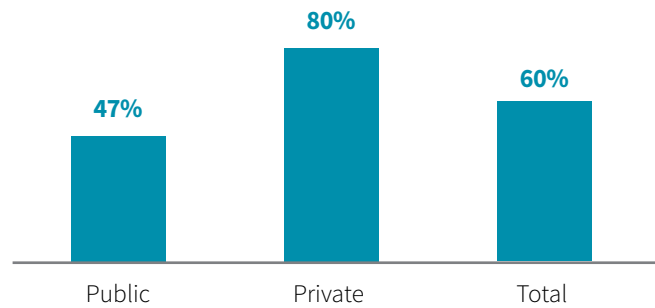


Figure 5-4: How job opportunity information is usually collected from industries

84. Polytechnics are performing some sort of tracking of their graduates – an important element for effective job placement service; the private polytechnics are far more likely to be doing it. Job placement services do not end with students graduating from the institution. Ideally, polytechnics should follow up on graduates after they left the institution to see

the status of employment. Tracking students after graduation is a costly undertaking, though extremely important as an element for job placement service and point of contact with employers. As discussed earlier, after being controlled for other variables, graduates from institutions that undertake graduates tracking are significantly more likely to find employment. For private institutions, there might be obvious and compelling reasons to want to follow up on graduates as they need to be able to advertise their high performance in graduate employment. Eighty percent of the private polytechnics reported conducting some form of tracking on graduates.



Source: Polytechnic Tracer Study 2016
Note: n=25

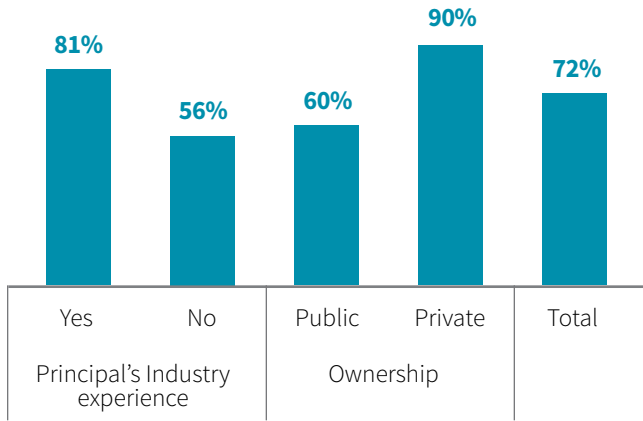
Figure 5-5: Proportions of polytechnics that track graduates' employment status

5.2 INDUSTRY COLLABORATION

85. Needless to say, successful partnerships between polytechnics and industries are essential for assurance of quality and relevance of teaching. Nonetheless, despite repeated calls for stronger ties between the two, industry and institution collaboration has been less than satisfactory in many cases. This section looks into the extent and types of industry partnership among the sampled polytechnics.

86. Most of the polytechnics claim to have some industry partnership while private polytechnics largely outperform public polytechnics. As much as 72 percent of the surveyed polytechnics have reported that they have some form of industry partnership that is on-going (Figure 5-6). Industry partnership has been one of the priority intervention areas for development projects in TVET, which should explain part of this outcome. Private polytechnics appear keener on maintaining partnership with industries as nearly all (90 percent) of them claim to have industry partners. Public polytechnics are lagging behind as the share drops to only 60 percent. Private polytechnics also tend to have more industry partners. More than half of the sampled private polytechnics have said they have more than 11 industry partners, while more than half of the public polytechnics have reported having fewer than five industry partners. Another

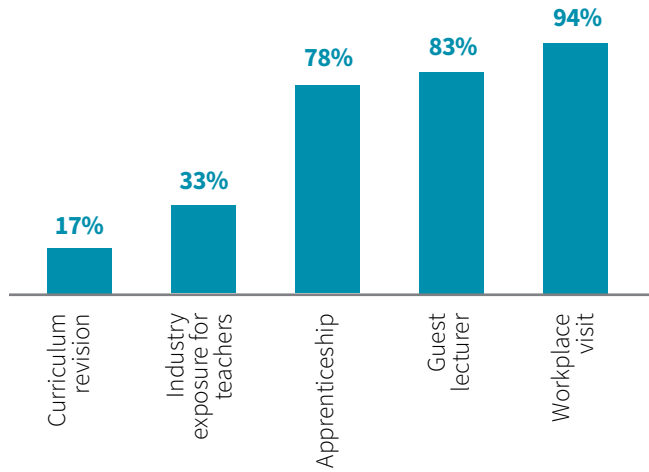
interesting tendency is that the principals' industry experience tends to have more industry partnership among the sampled polytechnics. These tendencies are not significant in strictly statistical terms as the number of institutions sampled is very small, but nevertheless they make logical sense and may offer some clue for further investigation.



Source: Polytechnic Tracer Study 2016
Note: n=25

Figure 5-6: Proportion of polytechnics that have industry partnerships

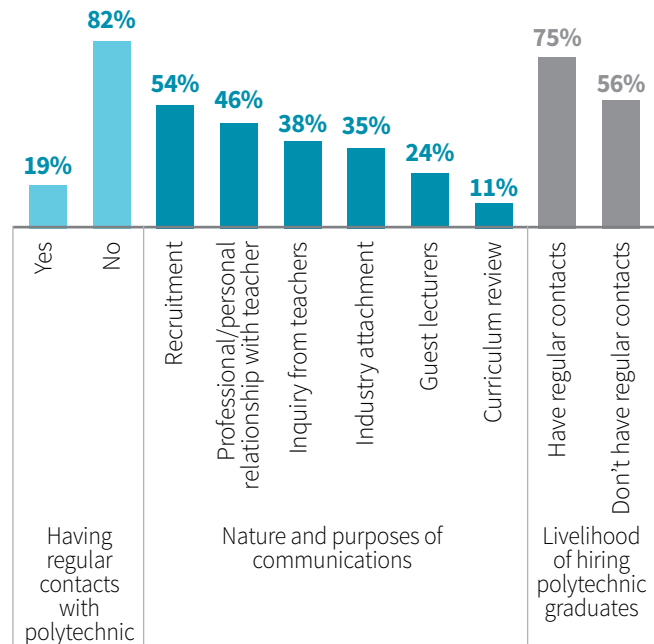
87. Most of the outputs from industry partnership are concentrated around the provision of additional training services for students, while industry involvement in curriculum design and teacher training is limited. When asked about types of activities that take place under industry partnership, three main activities have been highlighted, namely conducting apprenticeship, inviting as guest lecturers, and workplace visits (Figure 5-7). These are valuable opportunities for students to gain much-needed exposure to practical skills and the world of real work that bridge gaps between classroom and workplace. Almost all of the sampled polytechnics that have industry partners have reported they conduct workplace visits under the industry partnership. Around 80 percent of them have said they conduct apprenticeship and invite industry people as guest lecturers. While much of the engagement of industry partners are concentrated around these activities, their engagement in more substantial areas of teaching that would have more lasting impacts on the quality of training may be still limited. Industries have little involvement in curriculum revision as well as in provision of industry exposure opportunity for teacher training purpose. These should be strengthened. It should be noted, however, that the scope of institution-level industry collaboration for curriculum revisions is inherently limited as curriculum is tightly regulated centrally by BTEB. This may change in future if the country embraces competency-based curriculum and greater academic autonomy for institutions.



Source: Polytechnic Tracer Study 2016
Note: n=25

Figure 5-7: Types of industry partnership that polytechnics have

88. There is a large room for increasing the communication between polytechnics and employers as only a small proportion of the employers of polytechnic graduates have regular contact and communication with polytechnics. A little less than one fifth of the surveyed employers reported keeping regular contacts and communication with polytechnic institutions (Figure 5-8). Those who do have regular contacts and communication with polytechnics are doing so to discuss



Source: Polytechnic Tracer Study 2016
Note: Based on employers' responses; n=200

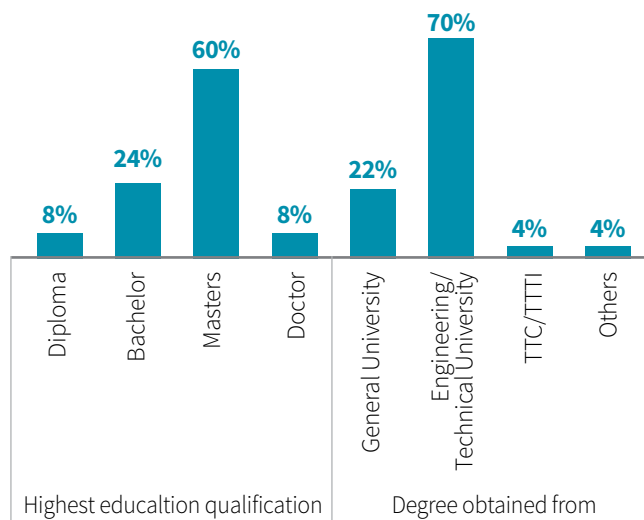
Figure 5-8: Level and type of communication between employers and polytechnics

recruitment arrangements, maintain personal and professional individual-level relationship with polytechnic teachers, or answer inquiries from teachers on technology issues. Industry attachment is another communication channel for employers to keep in touch with polytechnics. Direct involvement in training delivery through guest lecturers or curriculum review are, however, rather uncommon. Judging from the strong demand for highly skilled workers, employers seem to have a good reason to look to polytechnics as a source of supply of skills to fill those positions in their company. The survey result indicates that employers who have regular contacts with polytechnics are significantly more likely to want to hire polytechnic graduates. Communication with polytechnics is strongly correlated with employers' self-rated probability of hiring polytechnic graduates in the next three years. Intentions do not always get translated into action; yet it seems reasonable to say that employers who have regular contacts with polytechnics are significantly more likely to be willing to hire polytechnic graduates. Polytechnics may be able to strengthen their students' employment prospects by expanding various networks with employers and keeping them in contact regularly. That would likely contribute to reducing information gap in the labor market and promoting optimal labor matching between demanded skills and polytechnic graduates.

5.3 CAPACITY OF TEACHING STAFF

5.3.1 Head Teachers' Qualifications

89. The majority of polytechnic head teachers are Master's degree holders with degrees obtained from engineering and technical universities. Among the head teachers of the sampled polytechnics, 60 percent are found to have Master's degree (Figure 5-9). Having a Master's degree is one of the requirements for the promotion to head teachers today. Around a third of the head teachers have either Bachelor's degree or only Diploma. Seventy percent of the head teachers with Bachelor's degree or higher degrees have received the degree from engineering and technical universities, and around 22 percent did so from general universities. There seem to be no significant differences in the education qualification of head teachers between the sampled public and private polytechnics. The average age of head teachers of the sampled polytechnics, equally for public and private schools, is around 52 with the average years of teaching experience of around 25 years. After becoming a head teacher, those in private polytechnics tend to continue serving the same institution for a much longer period of time. This is most likely because of the differences in human resource management policies between the two. Private polytechnics have a near autonomy in appointing head teachers, while it is up to the

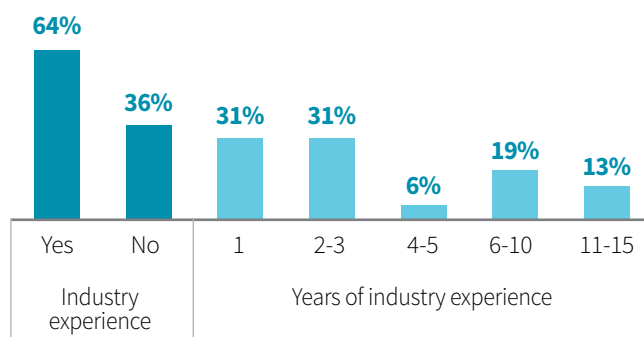


Source: Polytechnic Tracer Study 2016
Note: n=25

Figure 5-9: Education qualifications of polytechnic head teachers

government appointment for public polytechnics. Longer head teacher tenures would lead to more stable leadership, and may have some advantages in terms of planning and implementing institutional reforms and improvement activities.

90. The majority of head teachers possess at least a few years of industry experience. Having work experiences in industries is likely to be one of the strong assets for polytechnic head teachers who have to keep on good terms with industry stakeholders around the neighborhood. Around 64 percent of head teachers have work experience in industries for both public and private polytechnics. Their level of industry exposure may have been of limited scope as around 62 percent of those with industry experience have three or fewer years of work experience – most likely only up to novice or junior technician levels. Some 32 percent of those with industry experience have substantial industry work experience of six years or more.



Source: Polytechnic Tracer Study 2016
Note: n=25

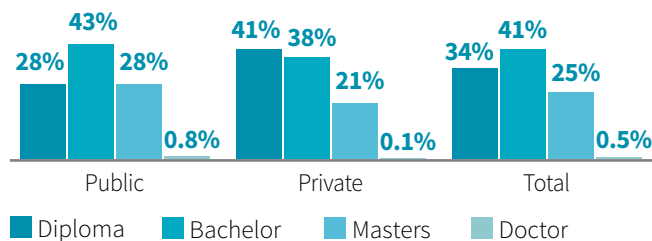
Figure 5-10: Industry experience and years of industry experience among polytechnic head teachers

However limited, industry work experience seems to come with some good leverages. As we will discuss in the subsequent section, polytechnics with head teachers with industry work experience are more likely to have industry partners. Moreover, the proportion of those who have industry work experience is twice as high for head teachers as teachers.

5.3.2 Teachers' Qualifications

91. Teachers' education qualification is one of the direct contributor that decides the level of knowledge to be transferred from teachers to students. Evidences show that there are strong correlations between the teachers' level of understanding about the subject and students' academic performance.

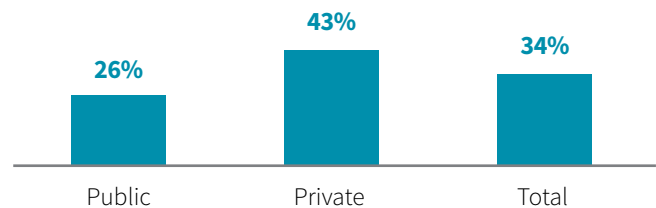
92. **On average, only about a quarter of teachers possess Master's degree, while around a third have only Diploma degree, indicating the urgent need for enhancing teachers' qualifications through continuous professional development.** Diploma degree is what polytechnic students would earn upon completion. Teachers with only Diploma degree are probably those who turned to the teaching profession soon after completing the polytechnic. In order to ensure adequate breadth and depth in knowledge being taught, teachers should ideally have qualifications that are higher than the degrees that courses that he/she is teaching would offer to students in the end. From that perspective, it is a worrying sign that a substantial proportion of polytechnic teachers have only Diploma degree. This seems to be particularly the case for private polytechnics. As much as 41 percent of teachers in the sampled private polytechnics – those considered as better ones among private polytechnics – hold Diploma degree only as opposed to 28 percent of public polytechnic teachers. In addition, the share of teachers with Master's degree is slightly lower for private polytechnics. For both public and private polytechnics, around 40 percent of teachers have Bachelor's degree. As discussed earlier, private polytechnics tend to have lower student teacher ratios (i.e. fewer numbers of students per teacher) which should be a blessing for students; unfortunately, however, those private polytechnic teachers seem to be less qualified as far as education qualifications are concerned.



Source: Polytechnic Tracer Study 2016
Note: n=1,452 (all the teachers in the 25 sampled polytechnics)

Figure 5-11: Education qualification of polytechnic teachers

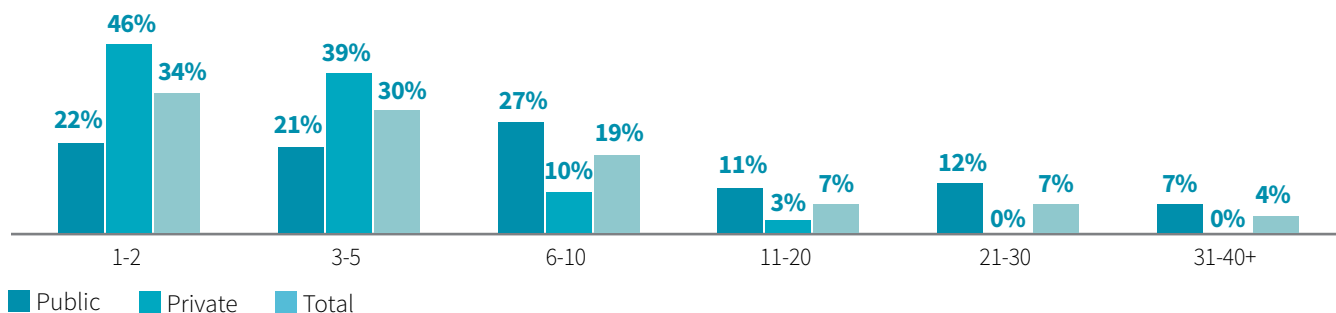
93. **The majority of public polytechnic teachers and half of private polytechnic teachers have no work experience in relevant industries, pointing to the need for strengthening industry exposure for teachers.** Overall, only around a third of polytechnic teachers have work experience in relevant industries (Figure 5-12). There appears to be a notable gap between public and private polytechnics. Teachers in public polytechnics are far less likely to have industry work experience than private ones. However, even at private polytechnics more than half of the teachers have no industry work experience. Practical experience gained in industries before joining the teaching force would compensate their low education qualification, and knowledge from industry experience would certainly boost the relevance of their teaching. Given unattractive compensation packages of polytechnic teachers, hiring teachers with industry experience may not always be an option. Training polytechnic teachers through industry exposure at industry partners would certainly be beneficial.



Source: Polytechnic Tracer Study 2016
Note: n=1,452 (all teachers in the 25 sampled polytechnics)

Figure 5-12: Share of teachers with work experience in industries

94. **Overall, a large portion of teachers in polytechnics seem not yet adequately experienced in teaching.** Notably, as much as a third of the teaching force in the sampled polytechnics are found to have a teaching experience of less than two years (see in next page Figure 5-13). Furthermore, 64 percent of teachers have five or fewer years of teaching experience. There is a distinctive gap between the public and private polytechnics. Teachers in private polytechnics have considerably fewer years of teaching experience. The average years of teaching is found to be four years for private polytechnics and 11 years for public ones. Nearly half of the teachers in the sampled private polytechnics have only one or two years of teaching experience. To be fair, the history of private polytechnics in Bangladesh is not nearly as old as that of public polytechnics, establishment of some of which date back to the Pakistan era, and teachers in the private polytechnics are found to be generally young (the average ages of teachers are around 37 and 30 for the sampled public and private polytechnics, respectively). Smaller student-teacher ratio and greater industry experience that private polytechnics enjoy may counteract some of the negative impact; however, it is evident



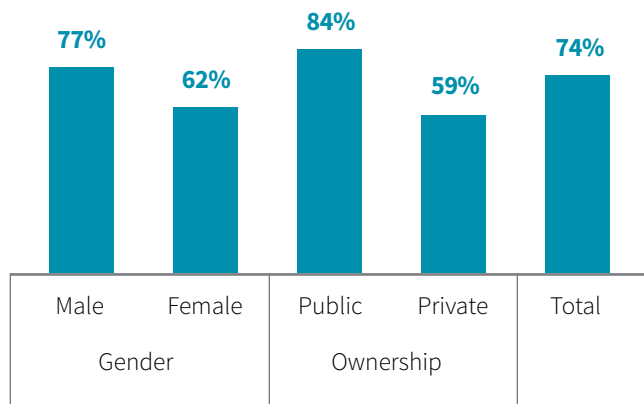
Source: Polytechnic Tracer Study 2016
 Note: n=1,452 (all the teachers in the 25 sampled polytechnics)

Figure 5-13: Years of teaching experience among polytechnic teachers by ownership of institution

that private polytechnics require special attention in terms of promoting and ensuring the quality of teaching staff.

95. The majority of polytechnic teachers have had at least some opportunities of in-service teacher training in the past three years; however, private polytechnic teachers and female teachers are lagging behind. It is found that overall around 74 percent of teachers have participated in at least one in-service training over the past three years (Figure 5-14). This result would appear as better than expected for many stakeholders since teachers in polytechnics had long been deprived of training opportunities. Intensive efforts of the government and development partners in providing trainings to polytechnic teachers seem to have paid off to some extent in this regard. However, benefits of teacher training seem to have been distributed somewhat unequally. Female teachers are less likely to have participated in in-service training in the past three years compared to their male peers (62 percent for female teachers as opposed to 77 percent for male teachers). Teachers in private polytechnics are also at a disadvantage when it comes to participation in in-service trainings as only 59 percent of them

have taken part in the training over the past three years while 87 percent of public polytechnic teachers have done so. More attention should be given to ensuring equal opportunity for female teachers and teachers in private polytechnics.



Source: Polytechnic Tracer Study 2016
 Note: n=1,452 (all the teachers in the 25 sampled polytechnics)

Figure 5-14: Share of teachers who have participated in in-service training in the past three years

Box 3: Building bigger and better teaching forces in polytechnics

Teacher shortage was a long-standing concern in the polytechnic system in Bangladesh. To address the issue, STEP has provided a total of 1,173 contract teachers to polytechnics to enhance the quality of teaching. As a result, the vacancy ratio of polytechnic teachers shrunk dramatically from 71 percent to 2 percent in public polytechnics. This also enabled public polytechnics to start a second shift to take in more students to cope with growing demands for enrollment. As a result, student-teacher ratio in the surveyed polytechnics was found to be high at 37 students per teacher on average, and 45 students per teacher in public polytechnics. Improving the teaching and management capacity of polytechnic teachers would be the key to high quality teaching under such a challenging school environment.

To enhance the capacity of polytechnic teachers, STEP has taken an initiative to introduce teacher training programs both in-country and overseas. STEP provided pedagogical training, subject-based training, and management training to over 2,000 polytechnic teachers by 2016. STEP also forged an international partnership with a leading polytechnic institute in Singapore (Nanyang Polytechnic) to provide high quality training and international exposure to polytechnic teachers. By the end of the project, STEP plans to train over 1,500 polytechnic teachers and managers under this partnership.

Source: Polytechnic Tracer Study 2016; STEP Semi-annual Progress Report, January-June 2016



Chapter 6

CONCLUSION AND RECOMMENDATIONS

96. Overall, it can be said that technical and vocational education at polytechnics is serving meritorious secondary graduates from lower income families in rural areas as a valuable pathway for socio-economic mobility by providing the technical skills needed for employment in industry and service sectors in urban zones. Most of the students in polytechnics are found to be graduates of lower secondary education up to Grade 10 (SSCs) with the terminal examination score of A or above. At the same time, nearly 70 percent of them, especially male students, are coming from families in rural areas and have parents who are often undereducated. For these families, their children studying at polytechnics in urban centers may well represent a hard-earned pathway to more labor-productive and higher income urban-based modern industry and service sectors in a country where only around six percent of the population have higher secondary education qualification or above²⁹.

97. Students' and graduates' levels of satisfaction over the quality and relevance of polytechnic education and training is generally high. Students and graduates responded quite positively about the relevance of training contents and quality of technical skills trainings at polytechnics. The fact that the responses from graduates, who would be more aware of requirements of the real world of work, are consistent with the students' positive views suggests that training programs at polytechnics are indeed meeting the basic technical skills demand of industries, at least at the foundational levels. Employers' opinion also corroborates this. Practical technical skills are found to be one of the areas that employers of polytechnic graduates value highly.

98. At the same time, more efforts are urgently needed in modernizing facilities and equipment of polytechnics, updating teachers' technical skills, nurturing soft skills such as communication skills and problem-solving skills, and strengthening ICT skills for work. Conditions of facilities and equipment at polytechnics are seen as least satisfactory by both students and graduates. Teachers' technical skills are also rated less satisfactory.

²⁹ According to Bangladesh Bureau of Statistics. (2011). Report on Labour Force Survey 2010. Dhaka. Around 5.6 percent of the population aged 5 years or above in Bangladesh have higher secondary certificate or above. Among the rural population, the figure goes even further down to 3.8 percent.

Despite the generally positive responses towards the quality and relevance of training programs, students and graduates seem to see weaknesses in the institutions' capacity of training delivery. Polytechnics are often deprived of investment in modern equipment and tools for training in spite of the rapid evolution and advancement of technologies in today's industries. Many of the polytechnic teachers are also severely underinvested in terms of continuous professional development and exposures to the latest technologies. Employers also want to see more improvement in practical skills of polytechnic graduates. MoE should continue its efforts towards upgrading the infrastructure for polytechnics, expanding training and industry exposure experience for teachers, and incorporating a greater range of practical skills training. Soft skills such as communication skills and problem-solving skills are seen by students and employers as another area for improvement in polytechnic training. The nature of today's technical works increasingly requires workers to be team workers, efficient communicators, and active problem-solvers. In addition to traditional technology-focused subjects, polytechnics should also teach students some basic soft skills that would make them more productive workers. MoE should enhance the quantity and quality of soft skills training at TVET institutions.

99. After completing polytechnics, graduates would have to face daunting employment prospects as job search performance among polytechnic graduates has been considerably below expectation. Only about a third of the polytechnic graduates would land a full-time or part-time job within two years of graduation. It would be far below the expectation of polytechnic students who chose to enroll in polytechnics with the hope that technical diploma qualification will help them find good jobs in future. Apparently technical diploma certificate would not be adequate in many cases to find the kind of jobs that polytechnic graduates are typically looking for. As a result, slightly less than a quarter of polytechnic graduates would straight move on to further education and training without first trying to find jobs. Even among those who have successfully secured wage employment, just about half of them did so through informal personal and family networks which allow them to avoid direct competition with other applicants for the job. As such, job search would be an uphill battle especially for students who have no or few reliable family networks in urban areas where most of technical jobs exist. As a consequence, around 20 percent of the graduates would

remain jobless even after two years of graduation. Two years of unemployment would render whatever skills they learned in polytechnics outdated and rusted. Furthermore, unemployment is significantly more common among graduates who went back to rural areas where jobs that require technical skills are fewer.

100. Female polytechnic graduates are faring far worse than their male peers in job placement outcomes. The government's efforts to increase the number of female enrollment in TVET has so far resulted in a steady increase in the share of females in polytechnics; however, the employment status of female polytechnic graduates seems to offer no comfort. Around 40 percent of female polytechnic graduates remain unemployed after one or two years of graduation, which is considerably higher than among male graduates (23 percent). Male and female graduates are equally likely to look for work, but would face completely different job prospects. The share of wage-employed graduates is only 30 percent, eight percent below that of male graduates, while the share of those in further studies is also substantially lower for females. This would be extremely discouraging for girls who might consider taking technical training for their post-secondary education, and betray the image of technical training as a quicker way to employment. To make matters worse, job options for female graduates appear to be rather limited compared to males as around a third of wage-employed female graduates found jobs in education and training institutions, which is three times higher than among wage-employed males. Female students are also more likely to rely on informal personal and family networks and on the institutions for job search. They are far less likely to find jobs through open advertisements than their male counterparts. In this sense, not only they are less likely to find jobs within more limited options, but also their job searches are more likely to be subject to pure chances in terms of how reliable their family network is or how capable their institution is of supporting them.

101. Once stuck in unemployment, prolonged joblessness seems to haunt many of the polytechnic graduates. This is an extremely worrying sign. It appears to be indicating a challenging scenario that Bangladesh is about to encounter by producing a generation of unemployed educated youths. Even after spending one and two years after completing polytechnics, around 29 percent and 21 percent of graduates still remain unemployed, respectively, while the share of employed graduates remains constant, indicating that many of the unemployed graduates have shifted to further education

and training in the meantime. Most of them are not unemployed because of job changes. Among those who are unemployed after two years, around 75 percent have remained jobless for more than one year. Such prolonged unemployment would make youth lose hope in job search and degrade their hard-earned skills, which would make their chance of finding jobs even slimmer. However, they seem less willing to explore different occupations or lower paying jobs that do not meet their expectations. Also, the idea of going into self-employment seems to have fallen off their mind. The main perceived reason for their remaining unemployed is a shortage of good jobs in their localities, and they seem to remain confident about their technical skills. As graduates of post-secondary education, they seem to maintain certain high expectations about the kinds of work they would do and the levels of income they would accept. Many of them also reported they would consider pursuing further education and training to improve the chance of employment, which would further stretch out the period of their de facto unemployment and would create greater financial pressure on their families. Many of the unemployed polytechnic graduates seem to be deep in limbo where their hard-earned education qualifications are not leading to jobs that they thought they would be eligible for, but they are yet to be willing to compromise on their expectations.

102. For those who are fortunate enough to be wage-employed, the majority are working as technical staff in private enterprises of varying sizes in a wide range of industries, particularly in manufacturing and construction businesses. If polytechnic graduates manage to land themselves wage jobs, they seem to be working in positions that are suitable for polytechnic graduates (i.e. technicians, engineers, and professionals). They typically start their career as assistant engineer/technician and move up the ladder. In this sense, polytechnic institutions are successfully supplying skilled professionals to fill intended positions in the labor market. Manufacturing businesses absorb the highest share (around 30 percent) of wage-employed polytechnic graduates, followed by construction enterprises. There are the growing industry sectors in Bangladesh economy today. Polytechnics are demonstrably a valuable supply source of technical skills needed in such booming industries. Firms in ICT business – another emerging industry in service sector – are also employing a good share of polytechnic graduates, both male and female. It is noteworthy that most of the employment for polytechnic graduates are found in private for-profit enterprises while employment in public entities are rare. While this is undoubtedly a disadvantage for

polytechnic students in term of available job options, it also makes the role of polytechnics unique and distinct as a supplier of skills for industries. This would only strengthen the case for furthering the partnership between polytechnics and industries and integrating industries' demands in training programs in more substantive manners.

103. Among the employed, female polytechnic graduates are at a disadvantage relative to their male peers in terms of quality of employment. There are stark gender differences among polytechnic graduates over the entire range of employment conditions and entitlements, including stability of contract, wage level, and wage increases. Female graduates are more likely to be put on less secure contracts, including part-time and contractual employment rather than full-time permanent employment. Wages are also suppressed for female graduates. Female polytechnic graduates are on average earning only 75 to 80 percent of income of male polytechnic graduates of the same age without controlling occupations. Female graduates tend to start their career with lower wages than males, and their wage increase tends to remain more sluggish in subsequent years. This is by no means limited to polytechnic graduates, and is a prevailing feature of the Bangladeshi labor market³⁰. However, if remunerations are to be based on the principle of merit and individuals' work performance, highly trained female workers with sound technical skills should be remunerated more equally as highly trained male workers. Discrimination against females' technical skills would not only discourage female graduates in workplace performance but also send secondary school students and their families a strong negative signal that skills training for females will not be worthwhile investments.

104. Self-employment as an alternative strategy for employment have yet to prove to be a viable option for polytechnic graduates. Advocates of TVET often claim that technical skills would open up a new possibility of self-employment for unemployed youth. While this success story does come true for some of the technical training graduates, as far as polytechnic students are concerned, the likelihood of becoming self-employed appears to be minimal. Only one percent of the graduates are found to be self-employed. Even among the unemployed, only a handful are considering going into self-employment as an alternate option. What makes self-employment unviable for polytechnic students are not immediately clear; however, one reason would be a lack of access to capital. Almost none of the self-employed graduates had received funding from external sources, including finance

³⁰ According to Ahmed, S., & Maitra, P. (2010). Gender Wage Discrimination in Rural and Urban Labour Markets of Bangladesh. *Oxford Development Studies*, 38(1), 83–112, the authors conduct decomposition analysis of gender wage gaps in urban and rural labor markets in Bangladesh using labor force survey 2000, and find that wage gaps are larger in urban areas and many of the gaps are attributable to gender discrimination against women after controlling for other factors.

from relatives. Another plausible reason would be a lack of business skills among polytechnic graduates. Polytechnic curriculums do have a course on entrepreneurship; however, it does not seem to be imparting adequate practical skills for building and managing businesses.

105. A third of the polytechnic graduates move on to enroll in other education institutions, typically universities and faculties of engineering to pursue higher-level qualifications; an engineering diploma from polytechnics may not be an adequate qualification for some industries. Completion of the four-year diploma course at polytechnics makes graduates eligible to apply for universities. It is evident from the finding that a substantial proportion of polytechnic students are using polytechnic education as a stepping stone towards admission in universities. Around a quarter of the graduates did not engage themselves in job search and moved straight to the next academic career. One of the common coping strategies for unemployed graduates is to pursue additional education and training opportunities. It is also noteworthy that the majority of the ‘employed’ polytechnic graduates are considering obtaining higher education degrees in technical and engineering fields. Taken together, it seems to indicate that polytechnic diploma is no longer seen by many as terminal qualification for many technical professionals. Rather, be it for job search or for career promotion, modern industries in Bangladesh today are increasingly demanding their technical staff to have higher education degrees in relevant technical fields. Whether such pressure for higher qualifications is stemming from excessive labor market competition (i.e. oversupply or mismatch of skills) or from technological advances is not immediately clear. What is clear is the fact that around a third of the polytechnic students will move ahead with higher education after graduation, and career guidance at polytechnics would need to take account of the entire ranges of options available to students, including not only job market but also possible higher education options most suitable for students’ aspirations and capacity.

6.1 RECOMMENDATIONS

106. This study has generated much insights and evidences that shed lights on the strength and weaknesses of polytechnic education in relation to graduates’ skills acquisition and employment. Based on those, this final section discusses and sets forth 10 recommended policy alternatives and educational strategies which would enhance the quality and

relevance of training and ultimately, the job market outcomes of graduates.

107. 1: Place graduates’ employment firmly and squarely at the center of efforts for improvement of the polytechnic system. First and foremost, employment prospects of polytechnic graduates need to be improved if polytechnics are to continue to be a meaningful career pathway for students. The employment- centered approach would encompass the entire spectrum of polytechnic system’s actions, including governance structure, institutional planning, monitoring and evaluation, curriculum design, teacher management, industry linkage, teaching facility and equipment, and job placement services; and should gear them strategically towards achieving better employment outcomes. The current poor employment performance, if left unaddressed, may pose a serious, even existential, threat to the polytechnic system. The fact that more than 75 percent of graduates did look for jobs and the current students have expressed high expectation about the relevance of diploma degree to jobs indicates that students are coming to polytechnics with a hope that the technical diploma would land them worthy jobs after successful completion. However, as this report has discussed, nearly 60 percent of graduates would end up in either unemployment or having to continue with higher education. Polytechnics cannot afford to continue producing unsatisfied graduates, and needless to say, joblessness takes a heavy toll on individuals and the system alike. Unemployed trained youths are human capital gone wasted and harmful to the economic growth as well as individuals’ wellbeing and quality of life. The polytechnic system needs to be more thoroughly committed to making its training relevant to the industry needs and being more accountable to the employment outcomes of its students.

108. 2: Give greater emphasis on higher-order cognitive skills and soft skills training such as problem-solving skills and communication skills in pedagogy and curriculum in polytechnics; embracing fully competency-based training should be a priority to pave the way for a more flexible demand-driven curriculum. More and more employers in different industries in Bangladesh are coming to view the soft skills of employees as a critical asset for the productivity of their workplace and see that Bangladeshi youth are in general not well prepared in soft skills³¹. This survey also found that soft skills are one of the areas that employers want to see improved. It is recommended that the Board and polytechnics introduce in their curriculum special training programs specifically with an aim to

³¹ Enterprise-based skills survey by the World Bank (2013) shows that three non-cognitive skills (responsibility, communication, and problem solving) are ranked by employers as most important skill sets for professional workers and are also associated with the largest shortfalls in actual skills levels of employees. The paper also shows that employers value non-cognitive skills more than cognitive ones.

impart essential soft skills to students (e.g. communication, team work, problem solving, critical thinking, etc.). To respond to the skills needs of industries, it would be beneficial if Bangladesh's polytechnic system fully embraces the competency-based training model. The BTEB has introduced National Technical and Vocation Qualification Framework (NTVQF), but the implementation has been lagging. Steady transition to NTVQF-based training courses up to the diploma level should be one of the high priority agenda for Bangladeshi TVET system.

109. 3: Invest more to upgrade the technical and teaching skills of teachers as well as equipment and facilities.

These are areas where students and graduates are least satisfied with and where employers would like to see more improvement. Improvement of employment outcomes cannot be accomplished without ensuring the quality and relevance of education and training imparted in polytechnics. Partnership with industries may well play a role in increasing the opportunity for teachers to have industry exposure to the latest technologies. This becomes even more important when the majority of teacher do not possess working experience in industries as found in this survey. Teacher vacancies are a critical issue that need to be resolved with utmost urgency. Teacher training for polytechnic teachers, both pre-service and in-service, should be strengthened to improve their pedagogical skills. TVET teacher training policies as well as roles of Technical Teacher Training College (TTTC) have to be reviewed. More financial resources from the government are apparently needed to modernize facilities and equipment to keep up with the basic requirements of modern industries. To diversify sources of financing, MoE and polytechnics should consider possibilities of 'revenue generation' as part of the activities of polytechnics through the provision of life-long training and skills assessment to workers in their localities. Special attention should be paid to soft skills training. More than ever before, in the face of rapidly evolving technologies and globalized business operations, the success of technical experts is defined by the mastery of soft skills that allow them to work effectively and deliver solutions. A new curriculum can be developed and implemented to introduce soft skills development programs in polytechnics.

110. 4: Further strengthen partnership with industry in an effort to improve the quality of education and promote graduates' employment. Repeated recommendations have been made countless times about the importance of forging strong partnership with industries. This report also finds yet another evidence of weak industry collaboration and engagement. Most of polytechnics have only a small number of partners, and some do not even have a single partner. Most of the employers, despite having hired polytechnic graduates before, do not have any regular communication, let alone formal partnership, with polytechnics. Industry partnerships are widely

known to be extremely useful to ensure the relevance of training programs. Furthermore, industry partners are also potential employers. As found in this survey, establishing and maintaining regular communication channels with them would likely contribute to enhancing the chances of polytechnic graduates finding jobs with those employers.

111. 5: Expand and improve job placement support services to students at the institution level. Under the STEP, most of the participating polytechnics have introduced employment cells or career support centers in their institutions that are responsible for supporting students through the job search process. However, they are still at a nascent stage, and still obscure in terms of their role and presence. It is found that most of the services provided so far have been counseling and advisories. While those will undoubtedly benefit students, more systematic and institution-based support services are yet to take root in many of the polytechnics. For instance, institution-wide actions such as organization of job fairs and career seminars, partnering with industries for preferential job placement, and establishment of alumni networks are still not frequently done, but would have a substantive impact on raising institutions' capacity to support students. Moving forward, polytechnic institutions should emphasize on how they can institutionalize employment cells and job placement support services at the institution level. In particular, public polytechnic institutions have a lot of work to do.

112. 6: Strengthen graduate tracking programs at the institutional level to support more systematic and active job placement support. Tracing the whereabouts and job status of former students is essential for designing and implementing functional high-quality job placement support strategies for polytechnics. Proper identification and analysis of the employment pattern and history of past graduates would offer valuable clues as to what the best strategies might be for the future graduates. At present, job placement services offered at polytechnics are not adequately based on evidences due to the lack of systematic collection of employment data from previous cohorts of graduates. Employment cells should introduce and institutionalize a graduate tracking mechanism. Already some of the private polytechnics have such a system in place where staff in charge of the employment cell maintains and update regularly a database of graduates and their current status mainly through contacting them over phone periodically.

113. 7: Institutionalize periodic tracking surveys of polytechnic graduates at a national level by Directorate of Technical Education. Many countries have established periodic graduate tracking programs for their TVET and higher education systems. The central skills development agency has a critical role in ensuring the availability of relevant public knowledge about how skills training rendered by TVET institutions are benefiting

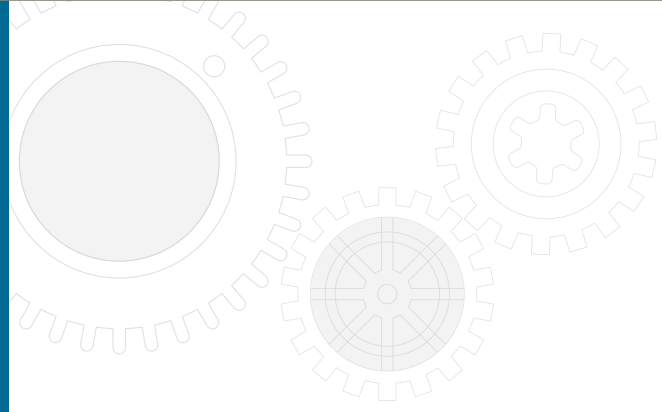
the labor market. To do this, it is essential that updated systemic data are available that demonstrate how graduates of TVET are faring in the labor market and how employers are viewing the skills of TVET graduates. This study was a pilot in this sense which provided a snapshot of graduates' employment outcomes, and should be continued under the MoE. Conducting periodic graduate follow-up surveys and establishing a graduate database should be part of the regular task of DTE. Information obtained through the follow-up surveys would be the evidence base for designing of courses and strategizing job placement services. Tracking can be done in different ways with different cost implications. Detailed efforts made in this study are one of the costly ways; however, such detailed data collection does need to be done on a regular basis. Cost-effective methods such as telephone survey or email survey should be explored as the way to establish a sustainable and regular graduate follow-up mechanism.

114. 8: Forge stronger ties with industry communities who would accept female technical specialists and technicians to boost job outcomes for female graduates. While male graduates struggle with job search, female graduates are bearing the full brunt of unfriendly job market environment. The disappointing state of female graduates' job placement that this survey found call for tailored and targeted interventions to uplift the employment outcomes of female students. Given the differences in job search strategies between male and female students, job placement support for female students may well be somewhat different from that for male students. Female students are more likely to find jobs through networks (i.e. through personal and institutional references to potential employers). Polytechnics have a bigger role to play to refer their female students to companies which are receptive to the hiring of female technical workers. More companies need to be brought into partnership with polytechnics for finding posts for female graduates.

115. 9: Provide special training programs on entrepreneurship and business management to encourage entrepreneurship for polytechnic students. Without a doubt, starting a business is not for everyone. Nonetheless, the near absence of self-employment among polytechnic graduates is indicative of the lack of appetite for running one's own business

as well as lack of practical knowledge and skills needed to be an entrepreneur and manage business operations. Expanding self-employment and entrepreneurship is certainly one of the ways to achieve greater job creation and a vibrant economy through skills development. A range of skills and know-how are useful for potential entrepreneurs, including skills such as how to identify business opportunities, raise funds, market your services, and manage accounts, etc. These skills would be of significant values not only for graduates who would start up businesses soon after graduation but also for those who may become entrepreneurs after gaining some years of work experience. Current programs for entrepreneurship at polytechnics are not so conducive or practical. DTE/BTEB, working with the partners, should develop and implement practical entrepreneurship training programs for polytechnic students.

116. 10: Further strengthen the evidence-base in TVET to drive evidence-based discussion and policy making towards more and better employment. This study has answered many questions; however, there are still a lot of evidence gaps to be filled. Knowledge about teaching practices and teacher competencies at public and private polytechnics are generally lacking. It would be necessary to conduct comparative analysis with employment opportunities and skills segments for graduates from other types of institutions such as general academic stream, colleges, and universities. More in-depth analysis on types of skills that employers are seeking from technicians and engineers would also be essential for future efforts to improve employment outcomes. A much better understanding of the skills demand and influencing factors is needed to analyze the reasons for high graduate unemployment despite the persistent claim of skills shortage in industries. Job markets are often imperfect, and knowledge on job market frictions and ways to alleviate them would be extremely useful. Insight into career progression and mid-career training opportunities for professionals, engineers and technicians would be crucial to design suitable training programs for upskilling needs and mid-career trainings. Moving forward, further investigations in the TVET sector are warranted to build a stronger evidence-base to steer policy discussions to the improvement of polytechnic education and graduates' employment outcomes.



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ANNEX

ANNEX 1: SURVEY METHODS

This annex illustrates details of survey methods and activities that were undertaken by the study team and research firm.

1. Questionnaire Preparation and Translation

The English version of the questionnaires were provided by the study team, and translated into Bangla by the research firm as an aid to the CAPI based questionnaires.

2. Training of Field Team

A 4-day workshop for the field teams was held in October 2015 in Dhaka. All the members of the research team including quality controllers, field supervisors and field investigators participated in the training program. The training program was designed to train the field team for the pilot survey with the finalized questionnaires and CAPI devices. This classroom training and the contents of the training covered a wide range of topics including a thorough review of the Questionnaires and CAPI devices. Upon completion of training, selected field enumerators were deployed for the pilot survey.

After completing the pilot survey during 13-18 October 2015, another 2 days de-briefing program was arranged. This two-day training was spent in discussing the feedbacks on the pilot survey and interviews, reviewing respondent selection methods, questionnaires and screener, CAPI devices, discussing corrective measures for the problems identified during the pilot interview and responsibilities of the Field Investigators and their Supervisors.

3. Pilot Survey

The main objective of the pilot survey was to test the field forces' cognition of the survey and use of instruments as well as to get practical experience with the questionnaires of different modules, CAPI methodology and respondents' reaction. The pilot survey was conducted in 2 Divisions: Dhaka and Chittagong.

Fifteen field teams, each consisting of 4 members went to the 5 assigned institutions to conduct pilot interviews during 13-18 October, 2015. The interviewers conducted face-to-face interview individually, and all categories of questionnaires were tested on CAPI devices. A total of 244 pilot interviews were completed.

4. Field Work

The main field survey was conducted from 14 February to 28 March 2016. All 25 institutes were distributed among 15 field teams. Teams were assigned to cover at least one institution as per the table below.

Team No.	Institution	Work Started	Work Ended
Team-1	Bogra Polytechnic Institute	14-Feb-16	28-Mar-16
Team-2	Kurigram Polytechnic Institute National Polytechnic Institute, Dhaka	15-Feb-16	3-Apr-16
Team-3	Chittagong Polytechnic Institute Institute Of Computer Science And Technology, Feni	14-Feb-16	28-Mar-16
Team-4	Patuakhali Polytechnic Institute Satkhira Polytechnic Institute	14-Feb-16	31-Mar-16
Team-5	Feni Polytechnic Institute Saic Institute of Management and Technology	15-Feb-16	31-Mar-16
Team-6	Rajshahi Polytechnic Institute Bangladesh Polytechnic Institute, Rajshahi	14-Feb-16	7-Apr-16
Team-7	Sylhet Polytechnic Institute	14-Feb-16	28-Mar-16
Team-8	Dinajpur Polytechnic Institute Institute of Science, Trade and Technology	15-Feb-16	3-Apr-16
Team-9	Kushtia Polytechnic Institute Jhenidha Polytechnic Institute	14-Feb-16	30-Mar-16
Team-10	Rajshahi Mohila Polytechnic Institute Shyamoli Ideal Polytechnic Institute, Dhaka	15-Feb-16	3-Apr-16
Team-11	National Polytechnic Institute Faridpur National Polytechnic Institute Dhaka	15-Feb-16	3-Apr-16
Team-12	Khanjahan Ali College Of Science and Technology, Khulna Saic Institute of Management and Technology	15-Feb-16	5-Apr-16
Team-13	Tmss Technical Institute, Bogra Narsingdi Polytechnic Institute	14-Feb-16	7-Apr-16
Team-14	Shyamoli Ideal Polytechnic Institute, Chittagong Institute of Science, Trade and Technology	15-Feb-16	30-Mar-16
Team-15	Brahmanbaria Polytechnic Institute Dhaka Polytechnic Institute	15-Feb-16	3-Apr-16

A comprehensive approach was applied for the data collection. GPS coordinates were collected from the tablet devices to confirm the locations of interviews taking place. The field supervisors were deployed to monitor the entire process and validate the gathered data.

Summary of Changes

During the field survey, some adjustments were found to be necessary in the selection of technologies for graduates because of the inadequacy of available graduates. Adjustments were necessary especially for private institutions, which tend to have a fewer numbers of graduates. Adjustments were made in a way that would minimize discrepancy with the original sampling design. The adjustments made are summarized below. Sampling weights were re-calculated taking account of the adjustments.

- Bogra Polytechnic Institute, Bogra: 2013 batch of Refrigeration and Air-conditioning Technology didn't have enough graduates. Replaced by Power Technology.
- Feni Polytechnic Institute, Feni: 2013 and 2014 batch of Architecture and Interior Design Technology course didn't have enough graduate students because of low student intake. Replaced by Power Technology.
- Bangladesh Polytechnic Institute, Rajshahi: 2013 batch of Mechanical Technology didn't have enough graduate students. Replaced by Civil Technology.
- Institute of Science, Trade, Technology, Dhaka: Electronics Technology didn't have enough graduates. Replaced by Textile Technology.
- Shyamoli Ideal Polytechnic Institute, Dhaka: Marine Technology replaced by Automobile Technology due to inadequate graduates.
- National Polytechnic Institute, Dhaka: Mechanical Technology didn't have enough graduates. Replaced by Telecommunication Technology.
- Khanjahan Ali College of Science and Technology, Khulna: Marine Technology and Mechanical Technology didn't have enough graduates. Replaced with Textile Technology and Garments Design and Pattern Making.
- TMSS Technical Institute, Bogra: Electrical Technology didn't have enough current students. Supplemented with students of Electronics Technology.

Graduate Tracking Record

Surveyors were to approach 2,000 graduates in the selected technologies in the sampled 25 institutions. The samples were divided up for two different year cohorts of 2013 and 2014. A total of 11,874 students had graduated from the selected technologies in the years of 2013 and 2014. Among those graduates, polytechnics were able to produce the contact information of a total of 8,605 graduates for the survey. Based on the list of contact information, the survey team attempted to establish contacts with randomly picked 5,343 graduates, out of whom 2,000 graduates were successfully interviewed.

		2014 Cohort	2013 Cohort	Total
1	Total No. of Graduates	6,165	5,709	11,874
2	No. of Graduates in the List provided	4,428	4,177	8,605
3	No. of Graduates Attempted to Contact	2,703	2,640	5,343
4	Successful Interviews	1,000	1,000	2,000

5. Data Processing and Quality Control

All the data were collected by using the CAPI devices with 3G connectivity to the internet. Entered data were synchronized into the CAPI server automatically upon the completion of interview sessions. The data stored on the CAPI server immediately became accessible to all the Supervisors.

Rigorous quality control procedures were employed throughout the field work period to ensure the quality of the data. For checking the consistency of data, the dependent questions were separately analyzed to see if there was any inconsistent data. Supervisors were required to check the data consistency before approving the entered questionnaires, and continuously checked the questionnaires on the CAPI server. When any errors were found, they rejected the questionnaire and informed the field teams to resolve the errors. In case of inconsistency or omission of information, the field team followed up with respondents over telephone to check the accuracy of the provided information. The Quality Controllers then re-checked about 30% of the approved questionnaires.

ANNEX 2: MULTI-STAGE SAMPLING AND WEIGHT CALCULATION

1. Selection of 25 Polytechnics

Among the 93 polytechnics under STEP support, one polytechnic has switched to a bachelor degree-offering institution, and thus is excluded from the sample. The 92 polytechnics are divided into four groups; namely (1) public with Institutional Development Grant (IDG), (2) public without IDG, (3) private with IDG, and (4) private without IDG. Twenty-five polytechnics are randomly selected from the 92 polytechnics. Weighted random selection is

applied with weights being equivalent to the number of students enrolled in the previous semester. The numbers of polytechnics selected from each group are: 10 polytechnics selected from among the group (1), and 5 polytechnics selected from each of the group (2), (3), and (4). Table 1 below shows the list of 92 STEP supported polytechnics which is the sample frame of primary sampling unit for this study. Table 2 below shows the result of the selection of 25 polytechnics selected through weighted random selection.

Table 1: List of 92 STEP Supported Polytechnics (Sample Frame)

Inst ID	Name of Polytechnics	Ownership	Intake last semester (Probability Weight)	Stratification Category
46027	Grassroots College Of Technology	Private	157	Pri-IDG
70047	National Institute of Technology	Private	278	Pri-IDG
23104	Bangladesh Polytechnic Institute	Private	341	Pri-IDG
20092	Bangladesh Institute Of Information Technology	Private	410	Pri-IDG
50116	Saic Institute Of Management And Technology	Private	447	Pri-IDG
50051	Institute of Science, Trade and Technology	Private	476	Pri-IDG
46028	National Polytechnic Institute	Private	499	Pri-IDG
70096	Shamoly Ideal Polytechnic Institute	Private	598	Pri-IDG
70095	Daffodil Institute Of It-Chittagong	Private	32	Pri-NonIDG
23107	The North Polytechnic Institute	Private	34	Pri-NonIDG
35050	Khulna Technical And Engineering College	Private	38	Pri-NonIDG
46025	Bangladesh Computer And Management Institute	Private	45	Pri-NonIDG
20086	Bogra Technological Institute	Private	46	Pri-NonIDG
45021	Gopalganj Model Polytechnic Institute	Private	46	Pri-NonIDG
61014	Madan Mohan College	Private	48	Pri-NonIDG
36005	Sakina Azhar Technical College	Private	54	Pri-NonIDG
23119	Puthia Polytechnic Institute	Private	57	Pri-NonIDG
50102	Institute Of Science And Information Technology	Private	65	Pri-NonIDG
50112	Micro Institute Of Technology	Private	76	Pri-NonIDG
30022	Dishari Institute Of Science And Engineering	Private	80	Pri-NonIDG
23071	National Science Research And Technology College	Private	91	Pri-NonIDG
57068	Mymensingh Institute Of Science And Technology	Private	95	Pri-NonIDG
17049	Ulipur Science And Technology Institute	Private	96	Pri-NonIDG
67014	Shaymoli Ideal Engineering College	Private	105	Pri-NonIDG
20094	Islami Bank Institute Of Technology	Private	119	Pri-NonIDG
53042	Royal Institute Of Technology	Private	133	Pri-NonIDG
50107	Bci Engineering Institute	Private	140	Pri-NonIDG

Inst ID	Name of Polytechnics	Ownership	Intake last semester (Probability Weight)	Stratification Category
16126	Uttara Polytechnic Institute	Private	142	Pri-NonIDG
50094	Rajdhani Polytechnic And Textile College	Private	149	Pri-NonIDG
25168	Model Polytechnic Institute	Private	164	Pri-NonIDG
50077	Ideal Institute Of Science And Technology (IIST)	Private	166	Pri-NonIDG
20095	Computer Science And Business Studies Institute	Private	169	Pri-NonIDG
48035	National Polytechnic Institute Manikganj	Private	201	Pri-NonIDG
68027	Noakhali Ideal Polytechnic Institute	Private	208	Pri-NonIDG
70062	Chittagong Technical College	Private	227	Pri-NonIDG
42061	Barisal Ideal Polytechnic Institute	Private	246	Pri-NonIDG
65055	CCN Polytechnic Institute	Private	247	Pri-NonIDG
29022	Mir Samsul Islam Polytechnic Institute	Private	257	Pri-NonIDG
20093	North-Bengle Institute Of Technology	Private	270	Pri-NonIDG
20097	Tmss Technical Institute	Private	288	Pri-NonIDG
20096	Institute Of Information Technology Bogra	Private	339	Pri-NonIDG
33157	City Polytechnic Institute	Private	359	Pri-NonIDG
54050	Haji Abul Hossain Institute Of Technology	Private	363	Pri-NonIDG
35049	Khanjahan Ali College Of Science And Technology	Private	369	Pri-NonIDG
69016	Institute Of Computer Science And Technology	Private	385	Pri-NonIDG
53033	Model Institute Of Science And Technology	Private	434	Pri-NonIDG
35066	Mangrove Institute Of Science And Technology	Private	435	Pri-NonIDG
42044	Infra Polytechnic Institute	Private	624	Pri-NonIDG
50099	Shyamoli Ideal Polytechnic Institute	Private	681	Pri-NonIDG
51020	Bangladesh Institute of Marine Technology	Public	90	Pub-IDG
70061	Chittagong Mohila Polytechnic Institute	Public	154	Pub-IDG
50087	Graphic Arts Institute	Public	172	Pub-IDG
35064	Khulna Mohila Polytechnic Institute	Public	244	Pub-IDG
23117	Rajshahi Mohila Polytechnic Institute	Public	322	Pub-IDG
50088	Mohila Polytechnic Institute	Public	340	Pub-IDG
52041	Narsingdi Polytechnic Institute	Public	360	Pub-IDG
63010	Habiganj Polytechnic Institute	Public	370	Pub-IDG
54049	Tangail Polytechnic Institute	Public	444	Pub-IDG
46026	Faridpur Polytechnic Institute	Public	517	Pub-IDG
13085	Dinajpur Polytechnic Institute	Public	536	Pub-IDG
27040	Kushtia Polytechnic Institute	Public	538	Pub-IDG
69015	Feni Polytechnic Institute	Public	539	Pub-IDG
33053	Jessore Polytechnic Institute	Public	631	Pub-IDG
65054	Comilla Polytechnic Institute	Public	640	Pub-IDG
23105	Rajshahi Polytechnic Institute	Public	689	Pub-IDG
42045	Barisal Polytechnic Institute	Public	703	Pub-IDG

Inst ID	Name of Polytechnics	Ownership	Intake last semester (Probability Weight)	Stratification Category
61016	Sylhet Polytechnic Institute	Public	706	Pub-IDG
26062	Pabna Polytechnic Institute	Public	726	Pub-IDG
16058	Rangpur Polytechnic Institute	Public	728	Pub-IDG
20099	Bogra Polytechnic Institute	Public	795	Pub-IDG
57067	Mymensingh Polytechnic Institute	Public	835	Pub-IDG
35048	Khulna Polytechnic Institute	Public	895	Pub-IDG
70048	Chittagong Polytechnic Institute	Public	912	Pub-IDG
50117	Dhaka Polytechnic Institute	Public	1436	Pub-IDG
65056	Bangladesh Survey Institute	Public	90	Pub-NonIDG
50003	Bangladesh Institute of Glass & Ceramics	Public	238	Pub-NonIDG
64024	Brahmanbaria Polytechnic Institute	Public	316	Pub-NonIDG
40029	Bhola Polytechnic Institute	Public	321	Pub-NonIDG
45015	Gopalganj Polytechnic Institute	Public	326	Pub-NonIDG
43014	Shariyatpur Polytechnic Institute	Public	330	Pub-NonIDG
56018	Sherpur Polytechnic Institute	Public	335	Pub-NonIDG
21064	Naogaon Polytechnic Institute	Public	339	Pub-NonIDG
34048	Satkhira Polytechnic Institute	Public	342	Pub-NonIDG
67016	Lakshmipur Polytechnic Institute	Public	343	Pub-NonIDG
74009	Cox's Bazar Polytechnic Institute	Public	343	Pub-NonIDG
30023	Jhenidha Polytechnic Institute	Public	345	Pub-NonIDG
66035	Chandpur Polytechnic Institute	Public	346	Pub-NonIDG
25064	Sirajganj Polytechnic Institute	Public	351	Pub-NonIDG
12053	Thakurgaon Polytechnic Institute	Public	353	Pub-NonIDG
72007	Bangladesh-Sweden Polytechnic Institute	Public	353	Pub-NonIDG
17057	Kurigram Polytechnic Institute	Public	363	Pub-NonIDG
39051	Patuakhali Polytechnic Institute	Public	429	Pub-NonIDG

Table 2: Selected 25 STEP Supported Polytechnics

Inst ID	Name of Polytechnics	Ownership	Intake last semester	Stratification Category
23104	Bangladesh Polytechnic Institute	Private	341	Pri-IDG
50116	Saic Institute Of Management And Technology	Private	447	Pri-IDG
50051	Institute of Science, Trade and Technology	Private	476	Pri-IDG
46028	National Polytechnic Institute	Private	499	Pri-IDG
70096	Shamoly Ideal Polytechnic Institute	Private	598	Pri-IDG
48035	National Polytechnic Institute Manikganj	Private	201	Pri-NonIDG
20097	Tmss Technical Institute	Private	288	Pri-NonIDG
35049	Khanjahan Ali College Of Science And Technology	Private	369	Pri-NonIDG

Inst ID	Name of Polytechnics	Ownership	Intake last semester	Stratification Category
69016	Institute Of Computer Science And Technology	Private	385	Pri-NonIDG
50099	Shyamoli Ideal Polytechnic Institute	Private	681	Pri-NonIDG
23117	Rajshahi Mohila Polytechnic Institute	Public	322	Pub-IDG
52041	Narsingdi Polytechnic Institute	Public	360	Pub-IDG
13085	Dinajpur Polytechnic Institute	Public	536	Pub-IDG
27040	Kushtia Polytechnic Institute	Public	538	Pub-IDG
69015	Feni Polytechnic Institute	Public	539	Pub-IDG
23105	Rajshahi Polytechnic Institute	Public	689	Pub-IDG
61016	Sylhet Polytechnic Institute	Public	706	Pub-IDG
20099	Bogra Polytechnic Institute	Public	795	Pub-IDG
70048	Chittagong Polytechnic Institute	Public	912	Pub-IDG
50117	Dhaka Polytechnic Institute	Public	1436	Pub-IDG
64024	Brahmanbaria Polytechnic Institute	Public	316	Pub-NonIDG
34048	Satkhira Polytechnic Institute	Public	342	Pub-NonIDG
30023	Jhenidha Polytechnic Institute	Public	345	Pub-NonIDG
17057	Kurigram Polytechnic Institute	Public	363	Pub-NonIDG
39051	Patuakhali Polytechnic Institute	Public	429	Pub-NonIDG

2. Selection of Technologies in the 25 Polytechnics

Technologies are divided into 5 technology categories: (1) Architecture and Civil; (2) ICT; (3) Electrical and Electronics; (4) Mechanics, Power, Shipbuilding and RAC; and (5) Others. Technologies in the category (5) Others are dropped from the sample as its enrollment are too few.

Technologies in the sampled 25 polytechnics are then grouped by the polytechnics group and the technology category. From each sub-group, technologies are sampled as a Secondary Sampling Unit. The numbers of technologies sampled in each sub-group are proportionate to the number of enrolled students last semester in respective sub-groups (Table 5).

Table 3: Category of Technologies and Enrollment in 25 Polytechnics

ID	Technology Category	Total Enrolled last semester	Total Female Enrolled last semester	# of courses offered
1	Architecture, construction, civil, survey	3545	568	39
2	ICT, design, graphic	2118	457	30
3	Electrical & Electronics	3634	525	43
4	Mechanics, automobile, marine, shipbuilding, aircraft, RAC, Power tech, textile	3046	200	41
5	Others (env tech, food tech, ceramic & glass)	570	73	8

Table 5: Distribution of Technologies in 25 Polys by Polytechnic Group and Technology Category

Poly Group	Technology Category 1			Technology Category 1			Technology Category 1			Technology Category 1		
	Course	Enroll	# of sample	Course	Enroll	# of sample	Course	Enroll	# of sample	Course	Enroll	# of sample
Pri-IDG	12	703	6	8	431	5	10	693	5	11	511	5
Pri-NonIDG	8	593	5	7	355	5	9	651	5	7	325	4
Pub-IDG	14	1791	11	10	903	9	18	1771	12	20	1974	13
Pub-NonIDG	5	458	4	5	429	4	6	519	4	3	236	3
Total	39	3545	26	30	2118	23	43	3634	26	41	3046	25

Technologies are randomly selected in each sub-group. The result of the selection is summarized in Table 6 below.

Table 6: Technologies Tentatively Selected by Multistage Random Selection for the 25 Polytechnics

Polytechnics	# of Technologies selected in each tech category				Total
	1	2	3	4	
Pri-IDG	6	5	5	5	21
Bangladesh Polytechnic Institute	2		1	1	4
Institute of Science, Trade and Technology	2	1	1	2	6
National Polytechnic Institute	2	1	2	1	6
Saic Institute Of Management And Technology		2	1		3
Shamoly Ideal Polytechnic Institute		1		1	2
Pri-NonIDG	5	5	5	4	19
Institute Of Computer Science And Technology		1	1		2
Khanjahan Ali College Of Science And Technology	2	1	1	1	5
National Polytechnic Institute Manikganj	1		1		2
Shyamoli Ideal Polytechnic Institute	1	2		3	6
Tmss Technical Institute	1	1	2		4
Pub-IDG	11	9	12	13	45
Bogra Polytechnic Institute	2	1	1	2	6
Chittagong Polytechnic Institute	1	1	1	2	5
Dhaka Polytechnic Institute	1	1	2	1	5
Dinajpur Polytechnic Institute	2	1	1	1	5
Feni Polytechnic Institute	2	1		1	4
Kushtia Polytechnic Institute		1	2	2	5
Narsingdi Polytechnic Institute	1	1		1	3
Rajshahi Mohila Polytechnic Institute		1	1		2
Rajshahi Polytechnic Institute	1	1	1	1	4
Sylhet Polytechnic Institute	1		3	2	6

Polytechnics	# of Technologies selected in each tech category				Total
	1	2	3	4	
Pub-NonIDG	4	4	4	3	15
Brahmanbaria Polytechnic Institute			1	1	2
Jhenidha Polytechnic Institute	1	1			2
Kurigram Polytechnic Institute	2	1	1		4
Patuakhali Polytechnic Institute	1	1	2	1	5
Satkhira Polytechnic Institute		1		1	2
Total	26	23	26	25	100

3. Weight Calculation

The sampling weights are calculated based on the probabilities of individuals being in the selected polytechnics, selected technologies, and selected within the technology.

First, polytechnic weight is calculated as:

$$P_{ijk} = x_i / X_{jk}$$

where P_{ijk} refers to the probability of polytechnic i to be sampled in ownership category j and IDG support category k ; and x_i refers to the intake size of polytechnic i ; and X_{jk} refers to the combined total intake size of polytechnics in ownership category j and IDG support category k . Then, the weight is calculated as an inverse of the probability:

$$w_i = 1/P_{ijk}$$

Technology weight is then calculated as:

$$T_{tijkc} = y_{ijk} / Y_{ijkc}$$

T_{tijkc} refers to the probability of technology t of polytechnic i to be sampled in the ownership category j , IDG support category k , and technology category c . y_{ijkc} refers to the number of technologies to be sampled in the ownership category j , IDG

support category k , and technology category c ; and Y_{ijkc} refers to the total number of technologies exist in the same group among the sampled polytechnics. The weight is calculated as:

$$w_{ti} = 1/T_{tijkc}$$

Finally, individual weight is calculated as:

$$I_{sti} = s_i / S_{ti}$$

I_{sti} refers to the probability of individual s to be sampled in technology t of polytechnic i . S_{ti} refers to the total number of students/graduates in technology t of polytechnic i (in case of graduates, the combined total number of graduates in 2013 and 2014 cohorts), whereas s_i refers to the number of individuals to be sampled in technology t of polytechnic i . The weight is calculated as:

$$w_s = 1/I_{sti}$$

Thus, the combined probability weight for student or graduate s of technology t of polytechnic i included in the sample, w_{sti} , can be expressed as:

$$w_{sti} = w_i \times w_{ti} \times w_s$$

ANNEX 3: DESCRIPTIVE STATISTICS OF THE SAMPLED GRADUATES AND STUDENTS

Variable	Value	Distribution (Weighted)	
		Students	Graduates
Gender	Male	0.85	0.89
	Female	0.15	0.11
Technology	Architecture	0.02	0.02
	Automobile Technology	0.01	0.02
	Civil Technology	0.22	0.21
	Computer Technology	0.19	0.18
	Electrical Technology	0.22	0.18
	Electronics Technology	0.08	0.08
	Mechanical Technology	0.09	0.09
	Power Technology	0.04	0.05
	Refrigeration and Air-conditioning	0.04	0.04
	Electro-Medical Technology	0.03	0.03
	Architecture and Interior Design	0.03	0.02
	Construction Technology	0.02	0.01
	Garments Design Pattern Making	0.01	0.01
	Mechatronics Technology	0.01	0.01
	Mining and Mine Survey	0.01	0.01
	Telecommunication Technology	0.00	0.00
Textile Technology	0.00	0.03	
Management of institution	Public	0.56	0.66
	Private	0.44	0.34
Year of graduation	2013	-	0.50
	2014	-	0.50
Geography of home address	Metropolitan	0.08	0.08
	Urban/Semi-Urban	0.24	0.28
	Rural	0.67	0.63
Geography of current address	Metropolitan	0.32	0.49
	Urban/Semi-Urban	0.56	0.36
	Rural	0.12	0.15

Variable	Value	Distribution (Weighted)	
		Students	Graduates
Division of home address	Rajshahi	0.23	0.20
	Khulna	0.16	0.18
	Dhaka	0.24	0.22
	Chittagong	0.19	0.20
	Barisal	0.05	0.06
	Sylhet	0.02	0.03
	Rangpur	0.11	0.11
Division of current address	Rajshahi	0.21	0.06
	Khulna	0.16	0.10
	Dhaka	0.25	0.62
	Chittagong	0.17	0.14
	Barisal	0.05	0.02
	Sylhet	0.07	0.03
		0.09	0.03
	Number of observations	1,000	2,000
	Weighted population size	33,600	41,200

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