An Assessment of Industrial Employment Skill Gaps Among University Graduates in The Gujrat-Sialkot-Gujranwala Industrial Cluster, Pakistan

Faisal Mehmood Mirza[a], Atif Ali Jaffri[b] and Muhammad Saim Hashmi[c]

Abstract

This study examines assessments of employers and students about job skills leading to differences in skill, employability, and perception gaps based on surveys of 100 industrial employers and 151 final year students from universities in Gujrat-Sialkot-Gujranwala industrial cluster. Factor analysis grouped specific skills into three interpretable categories: communication and business specific skills, core employability skills, and professional skills. The results suggest gaps in all three respects for each of the skill categories. Employers were least satisfied with the professional skills of new employees. Similarly, students scored their own professional skills lower than the importance of these skills in the job market. Close coordination among all stakeholders through internship programs for students, development and timely revision of market oriented curricula, and special skill enhancement training programs are recommended steps to enhance productive youth employment in Pakistan.

Introduction

A global labour market crisis since 2007 has worsened labour market mismatches and extended spells of unemployment for youth. According to the International Labour Organization, job entry requires skills and competencies that many young job applicants do not possess (ILO 2013). In addition to lacking basic skills, these young people also lack specific "21st century workplace skills" such as cooperation, communication, critical thinking, creativity, and a focus on the needs of the enterprise. Other factors responsible for youth unemployment include lack of entry level jobs, information, network and connections, and experience credentials (ILO 2012).

Pakistan's population consists of nearly one third youth (15-24 years), and two thirds of the population is less than 30 years of age; providing great opportunity of a demographic dividend. However, globally the uncompetitive youth of Pakistan confront several problems due to lack of attention from policy makers. Youth in Pakistan are characterized by low labour force participation, low engagement in community services, low quality of education, mismatches of education with the job market, gender based discrimination in employment, entrepreneurial and skill deficiencies, and, for university/college educated youth, missing university-industry linkages. The youth (15-24 years) employment to population ratio is very low (39.6%), particularly for females (18.8%) as compared to males (59.5%). Due in part to weak linkages of academia and job

markets, the unemployment rate for degree holders in 2010-11 was 8.7 percent as compared to an overall unemployment rate of 6 percent (see Table 1).

Table 1: Youth Indicators in Pakistan

Indicator	Level	Source
Youth (15-24) as percentage of population	21.4	Economic Survey of Pakistan (2012-13)
Labour Force Participation Rate (%) 15-19 years 20-24 years	 36.4 53.8	
Employment to Population (%) 15 years and above 15-24 years	 50.4 39.6	Labour Force Survey (2010-11)
Vulnerable Employment (%) Male Female	61 56.1 77.1	Pakistan Employment Trends (2011)
Unemployment Rate (%) Overall 15-19 years 20-24 years	 6.0 10.6 10.0	Labour Force Survey (2010-11)
Education Level of Literate Population, 10 years age & above (%) No Formal Education Below Matric Matric but below Intermediate Intermediate but below Degree Degree and Above	 0.4 38.0 10.8 4.8 4.5	
Unemployment Rate by Educational Attainment (%) Less than one year education Pre-primary education Primary but below Middle Middle but below Matric Matric but below Intermediate Intermediate but below Degree Degree	 3.8 4.0 4.9 5.9 7.9 10.8 8.7	

Insufficient supply of quality skills is one of the major impediments to economic growth in Pakistan (Kemal, 2005). Inadequate skills possessed by the workforce have direct consequences for overall GDP growth, total factor productivity in the economy, and the employability of fresh graduates. Although there has been a general neglect of the human resource development in Pakistan,[a] skill development has been most neglected. According to Pakistan's Annual Plan (2013-14), a faulty education system and little skills training are contributing in intensifying

---

[a] According to the Human Development Report (2013), Pakistan was ranked in 146th position on the basis of Human Development Index.

unemployment, along with macroeconomic factors such as slow growth and inadequate investment, a worsening law and order situation, and poor governance.

The Framework for Economic Growth (FEG, Planning Commission, 2011), identified skill mismatch as a fundamental reason for low competitiveness of industries in Pakistan. According to this report, only 8 percent of youth ages 17-23 years has access to higher education in Pakistan as compared to 17 percent in India. Among the 58.5 percent of the population that is literate (10 years plus of age), 38.4 percent have less than Matric level education, and only 4.5 percent have a university/college degree or higher. Even these degree holders have serious skill shortages compared to employers' demand.[a] Industry and service sectors face a serious shortage of skilled labour force having relevant education.

Gujrat-Sialkot-Gujranwala (GSG), referred to as Pakistan's industrial "Golden Triangle", is a globally known hub for the sporting goods, surgical instrument, leather garment, furniture, pottery, and electrical fan industries. In addition to approximately 21,000 industrial and business units registered with their respective Chamber of Commerce and Industries, many others are un-registered. The cluster is considered important at the national level due to its contribution in national development and sizeable share of the national economy. It is replete with labour-intensive small and medium enterprise (SME) industries. Such industries are greatly affected by the lack of skilled labour, which ultimately impacts economic growth at the national level due to lower output and exports. Educated labour, although a small portion of the overall skilled labour in these three congruent industrial cities, carries high importance to enhance industrial innovations and competitiveness at the national and international levels. According to FEG (Planning Commission, 2011), "there is a mismatch between the skills with which the youth graduate and those demanded by the market". A study by the University of Gujrat (2009) showed that employers in Gujrat and Gujranwala from industrial and service companies, including the furniture and fan industries, reported skill gaps between educated job applicants and market requirements.

This paper extends the limited previous analysis that has identified specific gaps and bottlenecks affecting the skilled labour force in the GSG industrial cluster. It focuses on three evaluations: the ranking of the skills of university/college graduate employees by employers with reference to their demand for (importance of) those skills (skill gap); the ranking by students of their skills with reference to their formed perceptions about market requirements for employability (employability gap); and the difference between rankings of importance of skills for employment by employers and students' perceptions of the importance of these skills (perception gap). The study is based on surveys conducted among 100 employers and 151 graduates from 6 universities and postgraduate colleges in the GSG tri-cities. Factor analysis is used to group 24 specific skills into three broad categories and the disaggregated results are also presented. The analysis is designed to address the following objectives:

1. To identify the skills employers rank most important while hiring fresh graduates.
2. To assess the level of satisfaction of employers with the skills of fresh graduates.
3. To document perceptions of university/college students about the required skills for employability and rankings of their own skills against their perceived benchmarks.
4. On the basis of 1-3, to assess the skill gap, employability gap, and perceptions gap related to the employment skills defined above.

---

[a] According to FEG (Planning Commission, 2011), Pakistan is ranked 92 out of 133 countries in a university-industry linkages index, much lower than China and India, which are ranked 23 and 46, respectively.

Previous studies related to skills mismatch in the GSG industrial cluster were performed either for individual cities within the cluster only, were descriptive but non-empirical, or dealt with only one type of gap. The current study covers the whole cluster for estimation of the three gaps. Recommendations based on this study provide a benchmark for designing policies to develop stronger university-industry linkages in Pakistan.

The rest of the paper is organized as follows. Section 2 presents a review of recent literature on skill gaps and related youth employment issues with special focus on Pakistan. Section 3 presents methodological issues and the survey design of the study, while section 4 explains findings of the study in the light of the existing literature. Finally, section 5 concludes the study and presents policy implications based on the findings.

Literature Review

The recent literature on employers' surveys shows that employers consider skills more important than qualifications. This section reviews the recent literature on skill gaps, and other impediments to youth employment, with a special focus on studies conducted for Pakistan and policies designed to boost youth employability, productivity, entrepreneurship, and competitiveness through skills enhancement. The reviewed literature provided the basis for developing a questionnaire, an estimation methodology, an interpretation of results, policy implications, and limitations of the current study.

The ILO (2012) has recently identified lack of relevant skills as one major cause of high rates of youth unemployment, as noted above. A second report (ILO, 2013) has also highlighted that the continuing global labour market crisis has worsened labour market mismatches and extended spells of unemployment. This report emphasized the need to tackle structural mismatches in skills through retraining activities, job counseling, and increases in productivity efforts from the government.[a]

Blom and Saeki (2011) studied the skill gap for Indian engineers through a survey of employers conducted in 2009.[b] The study classified all skills, by factor analysis, into three skills groups: core employability skills, communication skills, and professional skills. The results showed that overall employers were dissatisfied with the quality of engineering graduates. Employers considered all skills important, however, soft skills (core and communication) were ranked more important than professional skills. On the basis of the results, the study recommended that educational institutions focus on enhancing the soft skills of engineering graduates through special initiatives by the faculty.

Overall, employers are less demanding of technical skills, considering them trainable, if candidates exhibit employability and soft skills and positive attributes (Winterbotham et al., 2001). Amongst core characteristics, employers look for are motivation and flexibility. These include willingness to work and learn, appearance, behavior, confidence, and positive gestures and mannerisms (Bunt et al, 2005). Qualifications do not appear to be as important for a large number of employers and jobs; consistently ranking beneath characteristics and soft skills in recruitment frameworks (Bunt et al, 2005; Jenkins and Wolf, 2005).

In the case of Pakistan, a number of studies have been conducted dealing with the issue of skill shortages among university/college students. The FEG (Planning Commission, 2011)

---

a The International Labour Conference in 2012 initiated a Call for Action on Youth Employment Crisis agreed by all stakeholders including governments, workers and employers.
b The survey was a collaborated effort of National Project Implementation Unit, Federation of Indian Chambers of Commerce and Industry (FCCI), World Bank and Ministry of Human Resource Development.

comprehensively covered the issue of skill shortages and mismatches among youth in Pakistan. Identified the major factors responsible for this mismatch; including a weak university-industry-professional nexus, inadequate internship programs, absence of youth development programs at the provincial level, irrelevance of curriculum to market demand, lack of professionals to train youth, and too little focus on youth by the government. The FEG argued that youth should be seen as a solution not a problem and measures be taken to improve youth employment.

Hussain (2005) argued that in Pakistan an integrated model of skill formation is required, as practiced by the State Bank of Pakistan during the early 2000s. In this study, Dr. Ishrat Hussain recommended that universities should revise curriculum in consultation with industry. Further, qualified faculty and instructional staff should be hired and examination methodology needed to be revised. University faculty and trainers should be educated at world class institutions to see a multiplier effect.

Amjad (2005) advocated that Pakistan should focus on production of technology and knowledge based products; where most global growth emerges. To achieve this goal Pakistan should come out of the "low level skill trap". In this regard, investment in human capital is important to shift production from labour intensive methods towards high quality, technologically advanced, sectors.

Qayyum (2007) investigated the causes of youth unemployment in Pakistan. The main objective of the research was to sort out the reasons for unemployment and examine them. A sample of youth from 14,515 households was taken for this research. Out of these, 1,151 were found to be unemployed and 13,364 employed. The study found skill mismatch as one of the causes of unemployment. In this large survey, the majority of the surveyed youth were illiterate or less educated thus had a dearth of skills and faced difficulties entering into the labour market due to lack of education and skills required. Other constraining factors identified included lack of experience and regional, or provincial, discrimination in the provision of job opportunities.

Nayab (2008) argued that despite very low participation of the working-age population in the labour force, especially females, the unemployment rate has shown an increasing trend over time. This trend is particularly worrying in the light of the increasing numbers that are entering, and are still going to enter, the working-age group in Pakistan. In this regard, special focus is required on education, skills, public health, and those policies that promote labour market flexibility.

The British Council (2009) conducted a survey of 1,226 respondents aged 18-29 years from Punjab, Sind, NWFP, Balochistan, and AJK for qualitative research on youth aspiration to transform Pakistan into a prosperous nation. The study found that 50 percent of respondents believed that they the lack skills required by the modern labour market. Even educated youth were found struggling for decent work due to corruption and discrimination.

Rehman et al. (2009) investigated whether the current pattern of choosing fields of study is optimal with regard to the national interests of Pakistan. The paper showed that mismatches between the required combination of skills and available combination of skills carries heavy costs for developing countries like Pakistan because the import of skilled manpower is very costly for these countries.

Hou (2011) examined the challenges for youth unemployment in Pakistan including whether they are youth specific. Results indicated that youth employment in Pakistan faces many challenges, but some of them are also common in the overall labor market. The author concluded that particular focus on long-term investment in human capital through formal and informal

education, and strategically strengthening the links between education and the labor market would greatly benefit youth and the economy of Pakistan in the long run.

Farooq (2011) measured job mismatch in Pakistan from three dimensions: level of education, field of education, and skills. The author concluded that either educational institutions are producing graduates irrelevant to market demand, or they develop inadequate skills among students compared to market requirements. Further, criticizing the adequacy of existing labour force surveys, a regular occupational census in Pakistan was recommended to support policy makers in coping with job mismatch problems and achieving decent work related targets of the ILO.

Jabeen (2011) studied the mismatch between graduating university students' perception and employers' expectations regarding employability skills. By applying non-parametric techniques, the study found significant differences between employers' expectations and students' perceptions about needed skills. More importantly discipline, positive attitude, punctuality, time management, and oral communications are the skills highly ranked by the employers that are significant.

In the case of the GSG industrial cluster, a few studies have been conducted to assess the skill gap among university graduates and industry requirements. Bergard (2006) investigated the issue with a gender perspective by conducting a survey in Gujranwala. Interestingly, while comparing managerial skills of male and female workers, the study concluded that employers and teachers do not observe a significant difference. The industry ranked fresh graduates lowest in comprehension skills. Further, the study concluded that academia should focus on self-management and analytical skills of students to bridge the gap between skills possessed by fresh graduates and industry requirements.

The above review of literature shows that like other developing countries, ample empirical evidence of significant gaps in skills exists among educated youth in Pakistan. Studies have identified skill mismatch as a major cause of comparatively high youth unemployment and low productivity. Employers prefer skills over knowledge while hiring. Soft skills are considered more important than technical skills because employers consider technical skills trainable. At the national level, inadequate focus on youth development programs, absence of a university-industry-professional nexus, inadequate internship programs, and irrelevance of curriculum to market demand are considered major bottlenecks in reducing skill gaps in Pakistan. Most of the literature argues in favor of youth development programs because it is considered a source of a demographic dividend. Recently, a few studies based on employers' surveys have been conducted for individual cities in the GSG industrial cluster. However, no previous study has assessed existing skill gaps for the whole cluster. The current study intends to fill this absence by providing concrete evidence on different skill-related gaps which would support the policy framework presented in the FEG and related initiatives of the Planning Commission.

Methodology

This section describes the survey design and the data analysis tools used to address the research objectives presented in the introductory section. The literature on skill gap analysis lacks consensus on a single criterion to study skills demanded by employers. However, the literature provides broad analytical tools to assess the level of skills possessed by employees (Blom and Saeki, 2011; BFE, 2010; Becci et al., 2005).

We focus on final year degree program university/college graduates.[a] Our interest in skills of university/college graduates is about lifelong career management which requires a broad variety of skills and knowledge. These include all the skills that provide opportunities for successful job hunting, quick adaptation and professional development, accomplishment of job tasks, contentment, and adequate remuneration for the workers. We relied upon two types of structured interviews at two different stages. During the first stage, information related to the skill levels possessed by newly employed graduates was collected from employers in the industrial sectors in the GSG cluster. A total of 24 skills selected from related recent studies were discussed with the representatives from industry to make it a comprehensive and meaningful questionnaire. The details of the skill groups utilized in the three previous studies are provided in Appendix A and formed the basis for our study. Employers were requested to rank, on a five point Likert scale, the importance of each skill to be newly employed and to be an effective and efficient employee.

In the second stage, to capture the expectation level of fresh graduates about their employability, a sample of students in their final year in 6 universities and postgraduate colleges in the GSG tri-cities were asked questions on the importance level of skills that they consider pertinent to obtaining a job. Students were also asked to rank themselves in terms of their assessment of their own skills against their benchmark.

On the basis of the interviews, the three policy relevant gaps identified in the introduction were analyzed:

- First, the difference between the importance of each individual skill for the employers and their rating of the fresh graduates in these skills determines the skill gap prevalent in the job market that needs to be addressed for improving the productivity of workers.
- Second, the difference between students' perceptions of required employability skills in the job market and their ranking of their own skills against their perceptions of importance determines the employability gap. The employability gap serves as an indicator for educational institutions to evaluate their performance in producing market driven skilled labor force against their graduates' perceptions.
- Third, the difference between employers' importance of each skill and students' perception of skills needed to be an active member of the job market determines the perception gap. The perception gap sheds light on the strength of the university-industry link for producing a labor force relevant to the job market requirements.

Sample size and sampling strategy

Industries across the three cities in the GSG cluster are different and produce starkly different products, hence they demand different skill levels from the employees. To select a representative sample, we undertook a stratified random sampling from a population of industries registered with their respective Chamber of Commerce and Industries. A sample of 100 industrial employers was selected to estimate skill gaps. This sample size was then proportionally distributed within the industrial sector based upon the number of full member industries registered with their respective chambers.

There are a number of colleges and universities teaching at the tertiary level in the GCG cluster, but due to certain limitations it was not possible to select a sample covering all the universities and colleges. We undertook purposive sampling to select 6 different universities/colleges within the tri-cities and then randomly selected an interview sample of 151

---

[a]In the current research, we do not investigate the impact of skill impartation through vocational training programs on the employability of their graduates. Our survey questionnaire is available upon request.

final year/semester students. The students interviewed were belonged to 6 disciplines including engineering, computer sciences, economics, commerce and business administration.

The employers' ranking of fresh graduates[a] and the students' perception regarding the skill levels to achieve employment in the labour market were assessed using a list of 24 specific skills. Factor analysis was employed to group the individual skills into a small number of skill groups (factors). It is important to group a number of individual skills into a common latent factor (skill/ability) on a number of grounds. For example, employers often talk about the importance of soft skills, but it is difficult to get an exact definition of the term. Using factor analysis, we combined certain individual skills in the form of factors to get empirical evidence on the skills that form each group. Furthermore, the identification of a small number of factors allows identification of commonalities in demand and supply for skills, structures the findings, and provides a limit to the set of overall findings (Blom and Saeki, 2011).

Factor analysis is a data reduction technique that is used to extract latent variables on the basis of other observed variables. This method is extensively used in social sciences research, business studies, and psychology. In market research, factor analysis helps to analyze customer satisfaction, employees and employers' satisfaction, and the analysis of stock markets. Factor analysis has two types: namely exploratory analysis and confirmatory analysis. Exploratory factor analysis is applied to extract the factors without any information on how many factors explain the relationship between different characteristics, indicators, or items (Gorsuch, 1983; Pedhazur and Schmelkin, 1991; Tabachnick and Fidell, 2001; Ledesma and Mora, 2007; Cadman, 2010; Kim and Muller, 1978; Johnson and Wichern, 2007). On the other hand, when the dimension variables under consideration are clear, confirmatory analysis is used (Cadman, 2010). The steps in factor analysis include preparation of the relevant covariance matrix, extraction of initial factors, and rotation to a terminal solution are available upon request.

Results and Discussion

Information on the employers interviewed is presented in Table 2. There is an almost equal representation of the 100 firms between the three cities in the GSG cluster. Selected firms belong to furniture, steel work, fan, sport, surgical, leather, ceramic, furnisher, and other industries. In the sample of firms, 68 percent of respondents were either directors or mangers dealing with hiring of fresh graduates, as compared to only 12 percent owners.

Table 3 shows that 60.3 percent of students were from UOG, and 18.5 percent belonged to Punjab University, Gujranwala Campus (PU), collectively making up 78.8 percent of the sample. This composition was also reflected in the city wise composition showing that 63.6 percent of the sample was from Gujrat, followed by 24.5 percent from Gujranwala, and 11.9 percent from Sialkot. The discipline-wise composition reflects that 41.7 percent were in Engineering, Computer Science, and Information Technology (IT), whereas 58.3 percent of the sample was enrolled in the fields of Economics, Commerce, and Business Administration.

---

[a] Fresh graduate in this study was defined as an individual having a college degree in the above mentioned disciplines with a maximum of three years of work experience, but should not be: Foreign qualified, worked less than three months at that industrial establishment, works less than six hours in a week, had worked at the same establishment even before graduation, blood relative (son, nephew, daughter) of the management/business partner.

Table 2: Descriptive Statistics of Employers (100 firms)

Categories of employers by cities				
Type	**Gujrat**	**Gujranwala**	**Sialkot**	**Total**
Furnisher	7	0	0	**7**
Steel works	0	3	0	**3**
Fan	8	4	0	**12**
Sports	1	0	15	**16**
Surgical	0	0	8	**8**
Leather	0	0	5	**5**
Ceramics	0	2	0	**2**
Furniture	2	1	0	**3**
Industry	3	5	4	**12**
Misc	8	15	9	**32**
Total	**34**	**29**	**37**	**100**
Job titles of employers interviewed				
Job Title	**Frequency/Percentage**	**Cumulative percent**		
Owner	12	12		
Director	22	34		
Manager	46	80		
Accountant	8	88		
Others	12	100		

Source: Authors' Survey

Initial results presented in Table 4 show that overall employers were somewhat satisfied (3.24 on 5-point Likert scale) with the skill levels possessed by fresh graduates. Among the 100 employers, 31 percent were very satisfied, and only 7 percent were extremely satisfied. Whereas 15 percent were not very satisfied, and 3 percent were not satisfied at all. Interestingly, students' surveys showed similar results regarding overall satisfaction with the curricula offered to them as reflected by the average score of 3.15. Among 151 students, 26.5 percent were very satisfied and 7.95 percent extremely satisfied whereas 19.21 percent were not very satisfied with their curricula and 3.97 percent were not at all satisfied. Thus the distributions as well as the averages are similar for employers' satisfaction with new hires and students' satisfaction with curriculum. Students ranked satisfaction with their overall degree programs somewhat higher, with an average Likert scale score of 3.74. Almost half (47.7%) of the respondents indicated they were very satisfied with their degree program.

Table 3: Descriptive Statistics of Students (151 interviews)

Description	Frequency	Percentage
Universities/colleges wise composition		
University of Gujrat (UOG)	91	60.26
Zamindar College, Gujrat	5	3.31
Murray College, Sialkot	6	3.97
AllamaIqbal College, Sialkot	12	7.95
Punjab University, Gujranwala Campus (PU)	28	18.54
University of Engineering and Technology, Gujranwala Campus (UET)	9	5.96
Total	**151**	**100**
City-wise composition		

Gujrat	96	63.58
Sialkot	18	11.92
Gujranwala	37	24.50
Total	**151**	**100**
Discipline wise composition		
Engineering	20	13.25
Computer Science / Information Technology	43	28.48
Economics	41	27.15
Commerce	13	8.61
Business Administration	34	22.52
Total	**151**	**100**

Source: Authors' Survey

We further decompose the tabulation for students into two different groups based upon their fields of study to assess whether the student satisfaction with their degree programs and curriculum differed or not between the groups. The two groups of students were those enrolled in Engineering Computer Science and IT (Group 1) and Economics, Commerce, and Business Administration (Group 2).

Table 4 reveals that students from Group 1 on average ranked both their degree program (3.92) and curriculum (3.27) higher as compared to Group 2 (3.61 and 3.07, respectively). The students from Group 1, which represents students enrolled in disciplines requiring relatively high levels of technical skills, appear to be more satisfied with their degree programs and curricula on average than the students in the second group of disciplines. The second group includes social sciences and management disciplines in which the educational curriculum is less technical than in the first group. Due to the differences in the average satisfaction levels of the two student groups, we also carry out the employability and perception gap analysis for the two groups separately as well as jointly.

Table 4: Satisfaction Level of Employers and Students

	Employers' overall satisfaction	Students' satisfaction	
		Degree programs	**Curriculum**
	3.24	3.74	3.15
Satisfaction levels along the scale (in percentage)			
	Industry satisfaction with graduates	**Student satisfaction with degree program**	**Student satisfaction with curriculum**
Extremely satisfied	7.00	16.56	7.95
Very satisfied	31.00	47.68	26.49
Somewhat satisfied	44.00	29.80	42.38
Not very satisfied	15.00	5.30	19.21
Not at all	3.00	0.66	3.97
Students' Satisfaction by Disciplines			
Group 1 (Engineering, Computer Science and IT)			
Degree programs		**Curriculum**	
3.92		3.27	
Group 2 (Economics, Commerce and Business Administration)			
Degree programs		**Curriculum**	
3.61		3.07	

Factor Analysis[a]

In the first step towards estimation of the skill, employability, and perception gaps, we have applied factor analysis to group individual skills into different interpretable skill groups. Table 5 shows that the value of KMO test of sphericity is 0.718, which presents that the outcome is middling (see Appendix B). Bartlett's Test of Sphericity (Chi-Square = 763.764) significantly rejects the null hypothesis that mean correlation among all our variables is not identity. All of this shows that the correlation matrix is factorable.

Table 5: KMO and Bartlett's Test and Final Categories of Skills

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.718
Bartlett's Test of Sphericity	Approx. Chi-square	763.764
	D.f.	276
	Sig.	0.000
Factor Analysis Categories of Skills		
Comm/business specific skills	**Core employability skills**	**Professional skills**
Verbal communication Communication in mother tongue Customer service skills Reading skills Interpretational skills Entrepreneurship skills Ability to interpret business problems and develop appropriate solutions Ability to plan and organize	Team work Hard work Self-discipline Effective Devoted Productive Self-motivated Initiating	Accuracy Decision making skills Ability to apply knowledge of the subject Ability to use modern tools, equipment and technologies specific to job Honest Persistent Technical skills related to subject Efficiency

Source: Authors' Survey

For extraction of initial factors, the Principal Axis Factoring (PAF) method was used as the extraction method. According to the Kaiser-Guttman rule, a factors' eigenvalue should be greater than 1.00 in order to retain a factor. Results given in the appendix show that up to 3 factors have an eigenvalue greater than 1. For the selection of a factor to be retained in the analysis, cumulative eigenvalues criterion has also been applied. Results show that 3 factors have a cumulative value of 0.775 allowing us to retain 3 factors. Finally, a Scree plot of eigenvalues also showed similar results (Figure 1 in appendix). Thus all three methods of extraction support us to retain 3 factors for further analysis.

In the last step of factor analysis, un-rotated factors were rotated to have more meaningful interpretations. After that, factor loadings less than 0.4 were disregarded for interpretation. As a result of this step, three skill factors were named: Communication and Business Specific Skills, Core Employability Skills, and Professional Skills. The specific skills in each category are shown in Table 5. The factor analysis has cohesively separated the 24 specific skills into these three skill groups to a large extent. However, professional skills include two individual skills (honesty and persistency) which could be considered a part of core employability skills. Since factor analysis works merely on a statistical basis, overlapping between different groups in some situations is likely to prevail[b].

---

[a] Detailed results of this section are given in Appendix B and C.
[b] For detail discussion, see Blom and Saeki (2011).

Assessment of skill, employability, and perception gaps by category

Table 6 presents a summary of the results for the three categories of skills we have identified. Results of the employers' survey reflect that on average employers rank professional skills (4.13) as most important, followed by core employability skills (4.06), and communication and business specific skills (3.91). As shown in Table 9, statistical tests suggest the average score of communication and business specific skills by employers is lower (at the 5% significance level) than the average scores of professional and core employability skills, while the latter two scores cannot be distinguished statistically.

Employers are most satisfied with the graduates' professional skills (3.43), followed by communication and business specific skills, and the core employability skills (both 3.40)[a]. Employers express essentially the same ranking of satisfaction with new employees' skills whether that category of skills is ranked highly or lowly in terms of importance for employment. In all three cases employers give lower scores to their satisfaction with graduates' skills than the scores they assign to the importance of those skills. Therefore, an overall positive skill gap in the job market is observed for each skill category. The skill gap is the highest in professional skills (0.71), followed by the core employability skills (0.65), and the communication and business specific skills (0.51), with the gaps reflecting the differences in importance assigned to each category of skills. Comparing the above results with Blom and Saeki (2011), it is observed that against professional skills in our study they find the highest skill gap in core employability skills. The results we find are a departure from the argument in the literature that technical skills are less important to employers than employability, soft skills, and positive attitudes. However, our study, in line with Blom and Saeki's results, also found the least skill gap in communications skills.

Table 6: Overall results pertaining to Skill, employability and perception gaps

Assessments and gaps	Comm/business specific skills	Core employability skills	Professional skills
Assessments and Gaps (for employers and students in all disciplines)			
A. Employers' importance	3.91	4.06	4.13
B. Employers' satisfaction	3.40	3.40	3.43
C. Student's perception of importance	4.07	4.29	4.28
D. Student's own assessment	3.90	4.06	3.97
Skill gaps (A-B)	**0.51**	**0.65**	**0.71**
Employability gap (C-D)	**0.17**	**0.23**	**0.31**
Perception gap (A-C)	**-0.16**	**-0.23**	**-0.15**
Gaps for group 1(Engineering, Computer Science and IT)			
E. Student's perception	3.98	4.28	4.27
F. Student's own assessment	3.98	4.18	4.00
Employability gap (E-F)	**0.00**	**0.10**	**0.21**
Perception gap (A-E)	**-0.17**	**-0.23**	**-0.14**
Gaps for group 2 (Economics, and Commerce and Business Administration)			
G. Student's perception	4.13	4.30	4.29
H. Student's own assessment	3.85	3.98	3.90

---

[a] The detailed, skill wise results are presented in Appendix B

Employability gap (G-H)	0.28	0.32	0.39
Perception gap (A-G)	-0.23	-0.24	-0.16

Source: Authors' Survey

Table 7: Paired t-test for Grouped Skills

	Null Hypothesis	t-statistics	p-value	Decision
Industry Importance	Professional skills are equally important to core employability skills	1.72	0.09	Accepted at 5% level of significance
	Professional skills are equally important to communication and business specific skills	4.39	0.00	Rejected at 5% level of significance
	Communication and business specific skills are equally important to core employability skills	-2.57	0.01	Rejected at 5% level of significance
Students' Perception	Professional skills are equally important to core employability skills	-0.22	0.82	Accepted at 5% level of significance
	Professional skills are equally important to communication and business specific skills	7.01	0.00	Rejected at 5% level of significance
	Communication and business specific skills are equally important to core employability skills	-5.8	0.00	Rejected at 5% level of significance

Source: Authors' Survey

Contrary to the employers' importance, graduates rank core employability skills (4.29), highest in perceived importance, with a similar average score for professional skills (4.28), and a lower score for communication and business specific skills (4.07). Again, as shown in Table 7, statistically one cannot distinguish the scores for professional skills and core employability skills, while the average score for perceived importance of communication and business specific skills is statistically significantly lower.

Students give lower scores to their assessment of their own abilities than they give to the perceived importance of each category of skills. This employability gap, which is the difference between the students perception of the importance of those skills for employability and their assessment of their own skills, is highest in the professional skills (0.31), followed by the core employability skills (0.23), and the communication and business specific skills (0.17). Students view their professional skills as least strong relative to the perceived importance of those skills for employment. The similarity of the latter two employability gaps occurs despite the relatively lower perceived importance of communication and business specific skills compared to core employability skills. This results from students also giving the communication and business specific skills a lower assessment in terms of their own attained abilities than they give to their own core employability skills.

The employability gaps from student scores are each less than one half the numerical level of the skill gaps based on employer scores. While the relative rankings of importance among the three skill categories are in the same order for students and employers, the students seem to rank their acquired skills higher relative to their perceived importance of each category of skills for employability than employers' rank their level of satisfaction with new employees relative to their assessments of importance of the skills. The relatively lower employability gaps based on student scores is consistent with the relatively high scores they give (Table 6) on satisfaction with their

degree programs but somewhat at odds with their lower scores for satisfaction with their curriculum.

On average students' assessments about their required skills for employability are also higher in nominal level than the assessments made by employers about the importance of each skill category. Although the students and the employers give importance to the three different skill categories in similar order, the differences in numerical score levels about importance result in negative perception gaps for all categories of skills. The largest perception gap is reported for the core employability skills (-0.23), followed by similar perception gaps for communication and business specific skills, and professional skills (-0.16 and -0.15, respectively). The close levels of the three perception gaps reflect that students overall assign higher scores across all skill categories more than it suggests that students' perceptions of the relative importance of the different categories differs systematically among the categories of skills from employers' assessments of their relative importance.

Interesting further insights arise when the results are compared at a disaggregated level between the two different groups of students. The results for Group 1, which reflects the perceptions of students expected to have relatively more technical skills, shows they consider themselves more deficient in terms of the employability gap in the professional skills (0.21) in contrast to softer skills. Not only do these technical students rank communication and business specific skills lowest in perceived importance for employment, they also report on average that there is no gap between their assessment of their attained abilities and the importance of these skills for employment. These are quite striking results in relation to the literature emphasizing the importance to employers of soft skills. The surveyed students in the most technical disciplines neither perceive these soft skills to be important nor that they themselves are deficient in these skills, whereas the literature suggests these skills are important to employers, and that employers are not satisfied with the level of these skills among new employees.

Students in Group 2 are in generally less technical disciplines, and they assess their acquired skills lower relative to the importance of those skills than the students in Group 1 for all of the skill categories. This is consistent with the lower overall satisfaction these Group 2 students express about their degree programs and curriculum compared to Group 1, shown in Table 6. For Group 2, the employability gap is highest in professional skills (0.39), followed by the core employability skills (0.32), and communication and business specific skills (0.28). Overall, the above discussed results show three notable points. First, students in Group 1, which are supposed to possess high levels of technical skills required by the market, claim a shortage of technical skills. If so this means universities are not equipping them with adequate professional skills. Second, students in Group 1 lack perception of the likely importance and their own deficiencies in soft skills. If so, their education is again failing to equip them well for employment and careers. Third, students in Group 2, which might be expected to possess high levels of soft skills, are claiming that they are neither sound in professional skills nor in soft skills.

Conclusion and Policy Implications

A large share of Pakistan's population consists of youth, which may prove an opportunity or threat for inclusive and sustainable growth depending on the formulation and implementation of prudent policies to develop skills demanded by the job market. The FEG (Planning Commission, 2011) identified skill mismatch as a fundamental reason for the low competitiveness of industry in Pakistan. Available research-based evidence shows that employers in Pakistan by in large are dissatisfied with the level of skills possessed by fresh graduates and their relevance to job market

requirements. In the international literature, employers consider skills more important than qualifications.

The GSG tri-cities have been identified as an important industrial cluster by the Planning Commission of Pakistan. There are no previous studies showing rigorous empirical evidence about employer and student assessments of job skills for the whole cluster which could be used by policy makers to develop university-industry linkages for the GSG industrial cluster or as a benchmark for other clusters. To fill the gap, this current study was conducted following Blom and Saeki (2011), using surveys among 100 employers and 151 final year students from 6 universities and postgraduate colleges in the GSG cluster. Factor analysis was used to classify 24 specific skills into three interpretable groups.

The following policy implications can be drawn on the basis of the findings regarding the three gaps. First, to mitigate the skill gap of graduates, internships programs; development of, and timely revision of, market oriented curricula; and skill enhancement training programs for the GSG cluster are recommended. Our findings show that the highest skill gap is found in professional skills. Therefore, to mitigate this gap, university students need to be provided internships in the industries and short skill enhancement workshops in collaboration with GSG industries. Presently, curricula is prepared in isolation; potential employers having no role in this. Particularly, our results show that students of Economics, Business, and Commerce are relatively less satisfied with the existing curricula. To ensure timely revision of curricula, and adequate consultation with the industry, the Higher Education Commission (HEC) of Pakistan can compel universities to furnish annual reports on progress in innovation and relevance of curricula to make it market oriented and skill based.

Second, to address the employability gap, universities need to make skill assessment an integral part of academic training. This can be done by giving ample weight in grading to skill based learning. Our results show that the employability gap is highest in professional skills, and this gap is more felt by students of Economics, Business, and Commerce. To mitigate the employability gap, the assessment and grading system should be gradually revised to incorporate due weight to the ability of students in applying their knowledge in their final projects and research assignments.

Among these policy suggestions, the first recommendation can be implemented in the short run with low cost, whereas the remaining recommendations need to be implemented in the medium to long run to strengthen university-industry linkages in Pakistan. The government has already introduced internship programs like the Punjab Youth Internship Program, but these internships need to be introduced at large scale with consultation of all stakeholders.

Third, our results show that students, on average, give high importance to all skill groups as compared to industry; thus recording negative perception gap. To bridge this gap, close coordination among all stakeholders is crucial for youth employability, productivity, and skill enhancement. Continuous and purposeful dialogue among all stakeholders including policy makers, academia, and employers is recommended. The universities should introduce career counseling for students at different stages of tertiary education and make efforts to inform students of the importance of the diverse set of skills required by industries in GSG cluster. Regular conferences, seminars, workshops, orientations, and study tours for students should provide them a chance for interactions with industry and can play important role in bridging the gap.

References

1. Amjad, R. (2005). 'Skills and Competitiveness: Can Pakistan Break Out of the Low-level Skills Trap?' *The Pakistan Development Review*, Vol. 44(4).
2. Bergad.(2006). 'Skill gap in labor market a gender perspective.'Bergad, Gujranwala.
3. BFE (2010).'Employability Skills of the Young People in Bulgaria.'*Business Foundation for Education*, Bulgaria.
4. Blom, A. and Saeki.H. (2011). 'Employability and Skill Set of Newly Graduated Engineers in India.' *Policy Research Working Paper* 5640, World Bank.
5. British Council (2009). 'Pakistan: The Next Generation.'
6. Bunt, K., McAndrew, F. and Kuechel, A. (2005). 'JobcentrePlus Employer (Market View) Survey 2004.' *DWP Research Report* No 261, London: Department for Work and Pensions.
7. Cadman, B.D., Klasa, S. and Matsunaga, S.R. (2010). 'Determinants of CEO Pay: A Comparison of ExecuComp and non-ExecuComp Firms.' *The Accounting Review,* Vol. 85.
8. Cattell RB. (1983). 'The screetest for the number of factors.Multivariate Behav. Res.1:24576, 1966.' *University of illinois*, Urbana-Champaign, IL.
9. Fabrigar, Leandre R. et.al.(1999) 'Evaluating the use of exploratory factor analysis in psychological research.'*Psychological Methods,* Vol 4(3), Sep 1999, 272-299.
10. Farooq, S. (2011). 'The Utilization of Education and Skills: Incidence and Determinants among Pakistani Graduates.' *The Pakistan Development Review*, Vol. 50(3).
11. Gorsuch, R.L. (1983). *Factor Analysis* (Second Edition), Lawrence Erlbaum Associates, Inc. New Jersey, USA.
12. Hayton, James, C. et.al. (2004). 'Factor Retention Decisions in Exploratory Factor Analysis: A Tutorial on Parallel Analysis.' *Organizational Research Methods, Vol. 7 No. 2, April 2004 191-205*
13. Hou, X. (2011). 'Challenges for Youth Employment in Pakistan: Are They Youth-Specific?' *World Bank Policy Research Working Paper Series* 5544, World Bank.
14. Hussain, I. (2005). 'The Perils of Higher Skill Shortages for Pakistan's Economy-What Can We Do About it?'*Chief Guest address at the prize distribution ceremony of the Institute of Bankers*, Karachi, Conference on Education 2005.
15. ILO(2012). *Global Employment Trends 2012.*International Labor Organization, Geneva.
16. ILO(2013). *Global Employment Trends 2013.Recovering from a second job dip*. International Labor Organization, Geneva.
17. Jabeen, T (2011). *An Appraisal of Mismatch between Graduating Students' Perception and Employers' Expectations Regarding Employability Skills*. Thesis: University of Gujrat, Pakistan.
18. Jenkins, A. and Wolf, A. (2005). 'Employers' Selection Decisions: The Role of Qualifications and Tests.' In Machin, S., Vignoles, A. (eds.), *What's the Good of Education: the Economics of Education in the UK*, Princeton University Press.
19. Johnson, R. A. and Wichern, D. W. (2007). *Applied Multivariate Statistical Analysis.*Prentice Hall, USA.
20. Kemal, A. R. (2005). 'Skill Development in Pakistan.' *The Pakistan Development Review*, Vol. 44(4).
21. Kim, Jae-on and Muller, C. W. (1978). *Factor Analysis: Statistical Methods and Practical Issues*. Sage Publications, CA, USA.

22. Ledesma, R.D., Valero-Mora, P. (2007).'Determining the Number of Factors to Retain in EFA: An Easy-to-use Computer Program for Carrying out Parallel Analysis Practical Assessment' *Research & Evaluation*, Vol. 12 (2).

23. Nayab, D. (2008). 'Demographic Dividend or Demographic Threat in Pakistan.' *The Pakistan Development Review,* Vol. 47(1)

24. Newton, B., Hurstfield, J., Miller, L., Page, R., and Akroyd, K., (2005). 'What employers look for when recruiting the unemployed and inactive: skills, characteristics and qualifications.' *Department for Work and Pensions Research Report* No 295.

25. PBS (2011).*Pakistan Employment Trend*. Pakistan Bureau of statistics, Islamabad, Pakistan.

26. Pedhazur, E. J. and Schmelkin, L. P. (1991).*Measurement, Design, and Analysis: An Integrated Approach*. Lawrence Erlbaum.

27. Pett, M. A., Lackey, N. R. and Sullivan, J. J. (2003). *Making Sense of Factor Analysis, The use of Factor Analysis for Instrument Development in Health Care Search*. Sage Publications, Inc., California, USA.

28. Planning Commission of Pakistan (May 2011). "Framework for Economic Growth." Islamabad.

29. Rehman, A., Anis, H., and Khan, S. A. (2009). 'Skill Shortage versus Subject Choice: Case of Pakistan.' *The Pakistan Development Review*, Vol. 48(4).

30. Tabachnick, B. G., and Fidell, L. S. (2001).*Using Multivariate Statistics (4th ed.)*. Needham Heights, MA: Allyn& Bacon.

31. Thompson, B. and Daniel, L. G. (1996). 'Factor Analytical Evidence for the Construct Validity of Scores: A Historical Overview and Some Guidelines.' *Educational and Psychological Measurement*.

32. Winterbotham, M., Adams, L., Kuechel, A. (2002). 'Evaluation of New Deal 25 Plus.' *Qualitative Interviews with ES Staff, Providers, Employers and Clients.*DWP.

33. World Bank, World Development Indicator (2013).

34. Zwick,W. R.,andVelicer,W. F. (1986). 'Factors Influencing Five Rules for Determining the Number of components to retain.' *Psychological Bulletin*, Vol.99.

APPENDIX A: SKILL GROUPS FROM LITERATURE

Appendix D: Skill Groups Based on Factor Analysis from Relevant Empirical Literature

Employers' Satisfaction With Job Skills of Business College Graduates (Paranto and Kelker 1999)

Factor 1:Specific Skills	Factor2:Core Skills	Factor3:Personal characteristics	Factor4:Communication Skills
Database knowledge	Self confidence	Business ethics	Listening skills
Spreadsheet knowledge	Critical thinking	Professionalism	Speaking skills
Word processing knowledge	Creative thinking		Written communication
Ability to adapt to changing technology	Interpersonal skills		
Technical skills	Leadership skills		
Mathematical skills	Experience with real world problems		

Occupational Work Ethics Survey (Hill and Petty 1995)

Factor 1:Interpersonal Skills	Factor 2: Initiative	Factor 3:Being Dependable	Factor 4:Reversed Items
Courteous	Perceptive	Following directions	Hostile
Friendly	Productive	Following regulations	Rude
Cheerful	Resourceful	Dependable	Selfish
Considerate	Initiative	Reliable	Devious
Pleasant	Ambitious	Careful	irresponsible
Cooperative	Efficient	Honest	Careless
Helpful	Effective	Punctual	Negligent
Likeable	Enthusiastic		Depressed
Devoted	Dedicated		Tardy
Loyal	Persistent		Apathetic
Well groomed	Accurate		
Patient	Conscientious		
Appreciative	Independent		
Hard working	Adaptable		
Modest	Persevering		
Emotionally stable	Orderly		
Stubborn			

Skills Groups From Employers' Perception Survey (Blom Saeki 2011)

Factor 1: Core employability Skills	Factor 2: Professional Skills	Factor 3: Communication Skills
Integrity	Indentify, formulate, and solve technical/engineering problems	Written communication
Self-discipline	Design a system, component, or process to meet desired needs	Design & conduct experiment, and analyze and interpret data
Reliability	Use appropriate/ modern tools, equipment, technologies	Reading
Self-motivated	Apply knowledge of mathematics, science, engineering	Communication in English
Entrepreneurship skills	Customer service skills	Technical skills
Team work	Knowledge of contemporary issues	Verbal communication
Understands and takes directions for work assignments	Creativity	Basic computer
Willingness to learn		Advance computer
Flexibility		
Empathy		

Appendix B: Detailed Results of Skill Assessment							
		A.Employers' importance	B.Employers' Satisfaction	C.Students' perception	D.Students' own assessment	Skill Gap(A-B)	Perception Gap(A-C)	Employability gap(C-D)
Communication and business specific skills	Verbal communication	3.91	3.60	4.25	3.92	0.31	-0.34	0.33
	Communication in mother tongue	3.86	3.93	3.59	4.23	-0.07	0.27	-0.63
	Customer service skills	3.53	3.34	4.24	3.79	0.19	-0.71	0.45
	reading skills	3.99	3.53	3.81	4.11	0.46	0.18	-0.31
	Interpretational skills	4.18	3.36	4.12	3.83	0.82	0.06	0.29
	Entrepreneurship skills	3.97	3.01	4.07	3.69	0.96	-0.10	0.39
	Ability to interpret business problems and develop appropriate solutions	3.95	3.19	4.21	3.63	0.76	-0.26	0.58
	Ability to plan and organize	3.86	3.23	4.25	3.99	0.63	-0.39	0.25
	Average	**3.91**	**3.40**	**4.07**	**3.90**	**0.51**	**-0.16**	**0.17**
Core employability skills	Team work	4.23	3.77	4.34	4.16	0.46	-0.11	0.18
	Hard work	4.06	3.70	4.55	4.15	0.36	-0.49	0.39
	Self discipline	4.32	3.36	4.51	4.24	0.96	-0.19	0.27
	Effective	3.78	3.31	4.27	4.04	0.47	-0.49	0.23
	Devoted	4.30	3.39	4.16	4.09	0.91	0.14	0.07
	Productive	3.81	3.35	4.06	3.86	0.46	-0.25	0.20
	Self motivated	4.21	3.21	4.52	4.25	1.00	-0.31	0.27
	Initiating	3.74	3.13	3.67	3.70	0.61	0.07	-0.03
	Average	**4.06**	**3.40**	**4.26**	**4.06**	**0.65**	**-0.20**	**0.20**
Professional skills	Accuracy	4.07	3.58	4.03	3.91	0.49	0.04	0.12
	Decision making skills	3.97	3.19	4.43	4.13	0.78	-0.46	0.30
	Ability to apply knowledge of the subject	4.36	3.38	4.33	3.90	0.98	0.03	0.43
	Ability to use modern tools, equipment and technologies specific to job	4.10	3.34	4.50	3.86	0.76	-0.40	0.64
	Honest	4.17	3.78	4.59	4.52	0.39	-0.42	0.07
	Persistent	3.93	3.29	3.67	3.73	0.64	0.26	-0.06
	Technical skills(related to subject)	4.15	3.43	4.41	3.76	0.72	-0.26	0.65
	Efficiency	4.32	3.44	4.31	3.95	0.88	0.01	0.36
	Average	**4.13**	**3.43**	**4.28**	**3.97**	**0.71**	**-0.15**	**0.31**

APPENDIX C: FACTOR EIGENVALUES

Skills	Communication and business specific skills	Core employability skills	Professional skills	Uniqueness
Verbal communication	0.7452			0.4306
Communication in mother tongue	0.7203			0.4198
Customer service skills	0.6293			0.5816
Reading skills	0.6176			0.5997
Interpretational skills	0.5168			0.5863
Entrepreneurship skills	0.5011			0.7186
Ability to interpret business problems	0.4295			0.6434
Ability to plan and organize	0.4138			0.6955
Team work		0.6388		0.5902
Hard work		0.6204		0.5933
Self discipline		0.5407		0.6896
Effectiveness		0.517		0.6187
Devotion		0.4948		0.7079
Productivity		0.4644		0.647
Self motivation		0.4522		0.7726
Initiating		0.4233		0.7463
Accuracy			0.5917	0.6343
Decision making skills			0.5276	0.55
Ability to apply knowledge of the subject			0.5242	0.7194
Ability to use modern tools, equipment and technologies specific to job			0.5073	0.6745
Honesty			0.4423	0.6973
Persistency			0.4355	0.6773
Technical skills(related to subject)			0.4196	0.7827
Efficiency			0.3669	0.7749