PAKISTAN
Strategy Support Program

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IFPRI
A member of the CGIAR Consortium

WORKING PAPER No. 017 | April 2014

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

Faisal Mehmood Mirza, Atif Ali Jaffri, Muhammad Saim Hashmi

Posted: 04/21/2014

THE PAKISTAN STRATEGY SUPPORT PROGRAM (PSSP) WOKRING PAPERS

ABOUT PSSP

The Pakistan Strategy Support Program (PSSP) is an initiative to strengthen evidence-based policymaking in Pakistan in the areas of rural and agricultural development. Funded by the United States Agency for International Development (USAID) and implemented by the International Food Policy Research Institute (IFPRI), the PSSP provides analysis in four areas: agricultural production and productivity; water management and irrigation; macroeconomics, markets and trade; and poverty reduction and safety nets. The PSSP is undertaken with guidance from the Government of Pakistan through the federal Planning Commission and a National Advisory Committee, and in collaboration with Innovative Development Strategies (Pvt) Ltd. (IDS), Islamabad, and other development partners. For more information, please visit pssp.ifpri.info.

ABOUT the COMPETITIVE GRANTS PROGRAM

The Competitive Grants Program (CGP) is a component of the PSSP that provides support to Pakistani researchers on topics addressing the PSSP and related objectives. The goals of the CGP are to strengthen social science research within the academic community of Pakistan and to produce quality papers on important development policy issues. While PSSP working papers are not classified as peer-reviewed final publications, the papers developed under the CGP have been presented in program conferences and subject to reviews at the interim and final report stages. The CGP is guided by an academic Research Advisory Committee. For more information on the CGP, please visit pssp.ifpri.info under the tab capacity strengthening/competitive grants program.

This working paper is an output from a CGP grant awarded in June 2012.

ABOUT THE AUTHORS

Faisal Mehmood Mirza
Assistant Professor, Department of Economics, University of Gujrat (faisal.mirza@uog.edu.pk)

Atif Ali Jaffri
Assistant Professor, Department of Economics, University of Gujrat (atif.ali@uog.edu.pk)

Muhammad Saim Hashmi
Assistant Professor, Department of Economics, University of Gujrat (saim.hashmi@uog.edu.pk)

ACKNOWLEDGMENTS

The authors are thankful to David Orden and an anonymous reviewer for their valuable comments on earlier drafts of the paper. We are grateful to Research Advisory Committee (RAC) of Pakistan Strategy Support Program (PSSP) for their continuous guidance throughout the period of the project. This project was completed with financial support from an award of the Research Competitive Grants Program, PSSP, funded by USAID.

ABSTRACT

The objective of this study is to examine different assessments of employers and students about job skills leading to differences defined as skill, employability, and perception gaps based on surveys of 100 industrial employers and 151 final year students from 6 universities and postgraduate colleges in the Gujrat-Sialkot-Gujranwala industrial cluster. Factor analysis grouped 24 specific skills into the 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 compared to their scores on the importance of these skills. Students also scored their own professional skills lower than the importance of these skills in the job market. Smaller but similar differences arise for the other skill categories. Students generally gave higher nominal scores to the importance of all skills than were given by employers. When disaggregated by discipline, students in more technical fields (engineering, computer science, and IT), which are supposed to possess high level of technical skills, claim a shortage of these skills, whereas students from economics, commerce and business administration indicated they were neither sound in professional skills nor the softer skills. 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.

TABLE OF CONTENTS

LIST OF TABLES

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.[1] 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.[2] 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).

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,[3] 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 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.[4] Industry and service sectors face a serious shortage of skilled labour force having relevant education.

1 According to World Bank data, age dependency in Pakistan, defined as young and old (less than 15 and above 64 years of age) as a percentage of the total working age population, has fallen to 65.7 percent in 2010 as compared to 88.5 percent observed in 1975.

2 According to Global Innovation Index (2012), Pakistan was ranked 133rd out of 141 countries. Included for analysis, as compared, China and India ranked 34 and 64, respectively.

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

4 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.

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 and 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	

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.

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.[5]

Blom and Saeki (2011) studied the skill gap for Indian engineers through a survey of employers conducted in 2009.[6] 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.

5 The International Labour Conference in 2012 initiated a Call for Action on Youth Employment Crisis agreed by all stakeholders including governments, workers and employers.

6 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.

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) comprehensively covered the issue of skill shortages and mismatches among youth in Pakistan. It 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.

Jaffri (2012) discussed the current status of youth in Pakistan and policy recommendations to realize gains from the demographic dividend. Along with low labour force participation, he reiterated low quality of education, mismatch of education with job markets, youth entrepreneurial and skill deficiencies, missing university-industry linkage, low engagement of youth in community services, and gender based discrimination in the job market as major problems related to Pakistani youth. By investing in relevant education, skill enhancement, entrepreneurship, productivity, creativity, leadership and, most importantly, employability of the youth bulge, Pakistan can achieve high, sustainable and inclusive growth.

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.

To fulfill the prerequisites of the Higher Education Commission of Pakistan (HEC) for launching a two-year Associate Degree Program, the University of Gujrat (UOG) conducted a market survey in Gujrat and Gujranwala in 2009. For the employers' survey, a limited sample of 39 industrial and service companies, including in the furniture and ceiling fan industries, were selected through a snowball sampling technique. The study found that most of the employers reported skill gaps between educated new employees and market requirements. Employers having TEVETA[7] trained employees (39%) showed dissatisfaction with them because of poor course designs having little relevance with current market demand. They supported the UOG initiative of launching a market oriented two-year associate's degree program. Economic and political uncertainty facing the country created uncertainty about their business plans for most of the employers. .

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.

[7] Technical education and vocational training authority (TEVTA) is responsible for promotion and provision of demand driven technical education and vocational training in Pakistan.

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.[8] 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. The questionnaire also required the employers to rate their satisfaction level with the fresh graduates on each of the listed skills.[9]

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.

In sum, these three gaps helped us to identify the areas of needed improvement in the existing educational setups in the GSG industrial cluster and provide guidelines for developing programs that may cater to the needs of the industry.

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

[8] 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.

[9] To develop an understanding of how the demand for each individual skill will evolve over time, the employers were also asked to rank the relative importance of each of the skills in years to come. These results are not presented in this paper but are also available from the authors on request.

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 final year/semester students. The students interviewed were enrolled in 6 disciplines in these universities/colleges (see Table 2).

Table 2: List of Selected Universities/Colleges and Disciplines

Universities/colleges included in the sample selection	**Disciplines selected for data collection**
1. University of Gujrat, Gujrat	1. Engineering
2. University of Punjab, Gujranwala Campus	2. Computer Sciences
3. University of Engineering and Technology, Gujranwala Campus	3. Information Technology (IT)
	4. Economics
4. Government Murray College, Sialkot	5. Commerce
5. Government Post Graduate Zamindar College, Gujrat	6. Business Administration
6. Government Allama Iqbal Post Graduate College, Sialkot	

One issue addressed in undertaking the study concerned how to ensure the accuracy of collected data and the relevance of the evaluators from the employers who carried out the assessment of skill levels of the graduates. Along with pre-testing of the questionnaires, we arranged meetings with the representatives of major employers to get suggestions regarding the contents of the questionnaires and data collection, with a focus on the following issues:

- *Who will be responsible for assessing employer's satisfaction?* (Human resource department, manager of the new employee, or someone else). Employers were requested to identify the appropriate evaluator of the fresh graduates.
- *What will be the definition of a fresh graduate employee?* (Fresh university/college graduates or someone who has a few years of experience). Given the fact that many fresh graduates may have changed their jobs within a year or so, the impact of external factors such as in-house training should be removed to identify learning outcomes from their respective universities/colleges. Therefore, the meetings were aimed at "*defining*" who qualified as a fresh graduate to be evaluated by the employers.
- *What would be the level of employer's evaluation?* (At the individual level, at institutional level, or by overall average of all fresh graduate employees).

The decisions about the interviews made on the basis of the meetings and pre-testing carried out are summarized in Table 3. The respondents were properly informed about the purpose of the study and their consents were taken in writing ensuring that the information obtained in the survey will only be used for the research purpose and confidentiality of respondents will be ensured in all manners.

Table 3: Decisions about Criteria of Selection of Respondents

Who will evaluate employer's satisfaction?	Who will be evaluated?	What will be the unit of analysis?
1. Owner 2. Board member 3. Director 4. Manager of Human Resource Department 5. Manager of Finance	Fresh graduate 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: 1. Foreign qualified 2. Worked less than three months at that industrial establishment 3. Works less than six hours in a week 4. Had worked at the same establishment even before graduation 5. Blood relative (son, nephew, daughter) of the management 6. Business partner	It was decided that rather than evaluating the institutions or individual employees, the overall skill gap will be assessed at the industrial cluster level

The employers' ranking of fresh graduates 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; these are discussed in Appendix B.

RESULTS AND DISCUSSION

Information on the employers interviewed is presented in Table 4. 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. Almost half of the employer sample (48%) showed that the business was inherited. Interestingly, 85 percent of firms didn't have foreign capital involved in their establishment.

Table 4: 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		
Is it inherited business?				
Yes	48	48		
No	45	93		
No answer	7	100		
Was your firm established with participation of foreign capital?				
Yes	6	6		
No	85	91		
Don't know	9	100		

Source: Authors' Survey

Table 5 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. Interestingly, the gender-wise composition shows almost equal representation of both genders. Age wise composition reflects that 96.7 percent of the students were youth of age 20-23 years. Finally, 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 were enrolled in the fields of Economics, Commerce, and Business Administration.

Table 5: 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**
Gender wise composition		
Male	78	51.66
Female	73	48.34
Total	**151**	**100**
Age wise composition		
19 years	1	0.67
20 years	15	9.93
21 years	53	35.10
22 years	60	39.73
23 years	17	11.26
More than 23 years	5	3.31
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

Initial results presented in Table 6 show that overall employers were somewhat satisfied (3.24 on the 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 7.9 percent extremely satisfied whereas 19.2 percent were not very satisfied with their curricula and 4.0 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.

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 6 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 6: Satisfaction Level of Employers and Students

	Employers' overall satisfaction	**Students' satisfaction**	
	3.24	**Degree programs**	**Curriculum**
		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	
Likert scale			
Extremely satisfied	5		
Very satisfied	4		
Somewhat satisfied	3		
Not very satisfied	2		
Not at all	1		

Source: Authors' Survey

Factor Analysis[10]

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 7 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.

[10] Detailed results of this section are given in Appendix B and C.

Table 7: 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		
Communication and 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. 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 7. 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[11].

Assessment of skill, employability, and perception gaps by category

Table 8 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.

[11] For detail discussion, see Blom and Saeki (2011).

Table 8: Results Summary

Assessments and gaps	Communication and 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
Employability gap (G-H)	**0.28**	**0.32**	**0.39**
Perception gap (A-G)	**-0.23**	**-0.24**	**-0.16**

Source: Authors' Survey

Table 9: 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

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). 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.

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 9, 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.

Disaggregated results

Evaluation of the results for the 24 specific skills adds confirmation and additional information to the analysis based on the three categories of skills. Table 10 presents the detailed results for employers' scores and the skill gap. These disaggregated scores show variability within each of the three categories and further information between categories. As shown in Table 10, the top 6 skills considered by employers to be important are in the categories of professional and core employability skills. In each of these categories, at least 5 of the 8 specific skills are given scores on importance above 4.0, whereas in the communications and business specific skills only one skill is ranked as being this important. Similarly, 4 of the top 5 skill gaps are also found in these two categories, consistent with the overall ranking by employers with reference to their demand for (importance of) these skills, which showed the highest skill gap was in professional skills (0.71), followed by core employability skills (0.65), and communication and business specific skills (0.51). The analysis of the disaggregated skill gaps depicts that employers assigned higher importance scores for all skills except communication in mother tongue (for which the skill gap is -0.07) as compared to their satisfaction level.

Examining the employer results within each category, analysis of communication and business specific skills shows diverse results regarding the importance assigned to the specific skills by employers and their satisfaction with new employees in these skills. As Table 10 shows, the highest importance is assigned to interpretational skill (4.18) as compared to highest satisfaction from communication in mother tongue (3.93). The least important individual skill identified by the employers, among the skills included in this group, was customer service skill (3.53) as compared to the least satisfaction with entrepreneurship skills (3.01). Skill gap analysis for communication and business specific skills shows that the highest gap occurs in entrepreneurship skill (0.96) followed by interpretational skills (0.82).

In the case of the specific skills included in the core employability skills group, the employers assigned highest importance to self-discipline (4.32), followed by being devoted (4.30), as compared to least importance assigned to initiating (3.74). Furthermore, employers rank the highest level of satisfaction to team work (3.77) as compared to lowest rank again to initiating (3.13). The highest skill gap was found in self-motivation (1.00).

The results for professional skills reveals that employers ranked ability to apply knowledge of the subject as most important (4.36) followed by efficiency (4.32). The least importance was assigned to being persistent (3.93). As far as employers' satisfaction level is concerned, honesty (3.78) is ranked the highest among skills included in this group. The minimum level of satisfaction by the employers is assigned to decision making skills of new employees (3.19). Skill gaps among this group of skills vary from lowest for honesty (0.39) to highest for ability to apply knowledge to the subject (0.98).

Comparing employers' importance of different specific communications and business specific skills with results of Blom and Saeki (2011) we observe that employers in their study for India give highest importance to entrepreneurial skills (4.35), followed by reading skills (4.04) and give least importance to customer service skills (3.51). Our results show that employers in the GSG industrial cluster consider interpretational skills most important, followed by reading skills (3.99), while customer service skills (3.53) are again considered least important. Regarding core employability skills, our results coincide with Blom and Saeki (2011) and show that high importance is given to team work (4.23) as well as self-discipline and being devoted. Similarly, in professional skills, both studies find that employers give the highest importance to the ability to apply knowledge of the subject.

Comparing employers' importance in different communication and business specific skills with the results of Jabeen (2011), we find that both studies show that interpretational skills are considered most important. Regarding core employability skills, our results also coincide with Jabeen (2011) and show that high importance is given to team work and self-discipline.

Table 10: Detailed Results for Skill Gap

		Employers' importance	Employers' satisfaction	Skill gap
Communication and business specific skills	Verbal communication	3.91	3.60	0.31
	Communication in mother tongue	3.86	3.93	-0.07
	Customer service skills	3.53	3.34	0.19
	Reading skills	3.99	3.53	0.46
	Interpretational skills	4.18	3.36	0.82
	Entrepreneurship skills	3.97	3.01	0.96
	Ability to interpret business problems and develop appropriate solutions	3.95	3.19	0.76
	Ability to plan and organize	3.86	3.23	0.63
	Average	**3.91**	**3.40**	**0.51**
Core employability skills	Team work	4.23	3.77	0.46
	Hard work	4.06	3.70	0.36
	Self-discipline	4.32	3.36	0.96
	Effective	3.78	3.31	0.47
	Devoted	4.30	3.39	0.91
	Productive	3.81	3.35	0.46
	Self-motivated	4.21	3.21	1.00
	Initiating	3.74	3.13	0.61
	Average	**4.06**	**3.40**	**0.66**
Professional skills	Accuracy	4.07	3.58	0.49
	Decision making skills	3.97	3.19	0.78
	Ability to apply knowledge of the subject	4.36	3.38	0.98
	Ability to use modern tools, equipment and technologies specific to job	4.10	3.34	0.76
	Honest	4.17	3.78	0.39
	Persistent	3.93	3.29	0.64
	Technical skills related to subject	4.15	3.43	0.72
	Efficiency	4.32	3.44	0.88
	Average	**4.13**	**3.43**	**0.70**

Source: Authors' Survey

The detailed results of the student evaluations and the employability gap, reported in the Table 11, show that honesty (4.59) and hard work (4.55) are perceived as being the most important skills as compared to the lowest perception of importance for communication in mother tongue (3.59). Graduates rank themselves highest on being honest (4.52) as compared to a minimum assessment of their skills on the ability to interpret business problems and develop appropriate solutions (3.63).

In terms of the employability gaps for specific skills, among communication and business specific skills, students score their own ability higher than the importance of the skill for communication in mother tongue (-0.63) and reading skills (-0.31). For the six other specific skills in this category the employability gap is positive, indicating that students' perception of importance of the skill is scored higher compared to the students' assessments of their own skill. The largest gap was found for ability to interpret business problems (0.58) and customer service skills (0.45).

The results for core employability skills show that students assess themselves highest for self-motivated (4.25), followed by self-discipline (4.24), and lowest on initiating (3.70). However, the employability gap is highest for hard work (0.39). The employability gap is negative for initiating (-0.03). For this skill both students' perception of importance (3.67) and students' own skill assessment (3.70) are relatively low.

For the professional skills category, the analysis portrays that graduates rank honesty and ability to use modern tools, equipment, and technologies specific to the job (4.50) as most important. They rank themselves well on honesty (4.52) but much lower on ability to use tools, equipment, and technologies (3.86). As a result, for these two specific skills, the employability gap is only 0.07 for honesty but 0.64 for the ability skill. The employability gap is highest for technical skills related to the subject (0.65). A negative employability gap (-0.06) emerges for the skill of being persistent; it is scored lowest in importance (3.67) but also scores lowest in students' assessment of their own skill (3.73).

Table 11: Detailed Results for Employability Gap

		Students' perception	Students' own assessment	Employability gap
Communication and business specific skills	Verbal communication	4.25	3.92	0.33
	Communication in mother tongue	3.59	4.23	-0.63
	Customer service skills	4.24	3.79	0.45
	Reading skills	3.81	4.11	-0.31
	Interpretational skills	4.12	3.83	0.29
	Entrepreneurship skills	4.07	3.69	0.39
	Ability to interpret business problems and develop appropriate solutions	4.21	3.63	0.58
	Ability to plan and organize	4.25	3.99	0.25
	Average	**4.07**	**3.90**	**0.17**
Core employability skills	Team work	4.34	4.16	0.18
	Hard work	4.55	4.15	0.39
	Self-discipline	4.51	4.24	0.27
	Effective	4.27	4.04	0.23
	Devoted	4.16	4.09	0.07
	Productive	4.06	3.86	0.20
	Self-motivated	4.52	4.25	0.27
	Initiating	3.67	3.70	-0.03
	Average	**4.29**	**4.06**	**0.23**
Professional skills	Accuracy	4.03	3.91	0.12
	Decision making skills	4.43	4.13	0.30
	Ability to apply knowledge of the subject	4.33	3.90	0.43
	Ability to use modern tools, equipment and technologies specific to job	4.50	3.86	0.64
	Honest	4.59	4.52	0.07
	Persistent	3.67	3.73	-0.06
	Technical skills related to subject	4.41	3.76	0.65
	Efficiency	4.31	3.95	0.36
	Average	**4.28**	**3.97**	**0.31**

Source: Authors' Survey

The detailed results for the perception gap are given in Table 12. This table again shows that employers considered ability to apply knowledge (4.36) as the most important skill followed by efficiency (4.32) and self-discipline (4.32), while students' ranked honesty (4.59) and hard work (4.55) as the skills perceived as most important for obtaining a job and performance (the first two columns of Table 12 replicate the first columns of Tables 10 and 11, respectively). Employers considered customer service skills (3.53) and initiating (3.74) as the least important skills required for fresh employees and performance. Students consider communication in mother tongue (3.59) and initiating (3.67) as least important for job acquiring and performance.

Although the overall perception gaps are negative for each category of skills (see Table 8), for specific skills the perception gap is positive for 9 of the 24 cases. For these specific skills, students' perception of the importance of the skill is scored lower than employers' score of its importance despite the overall higher nominal scores students in general give compared to employers. The largest positive perception gaps are for communication in mother tongue (0.27) and being persistent (0.26). Conversely, the most negative perception gap is for customer service skills (-0.71), where employers give a relatively low importance score (3.53) while students perceive this skill to be fairly important (4.24). However, the perception gap, shows that all three skill categories mostly contained negative gaps (15 out of 24 in total).

The results for specific skills included in communication and business specific skills show that students perceived verbal communication, ability to plan and organize (both 4.25), and customer service skills (4.24) as the most important, while communication in mother tongue is perceived as the least important by the graduates (3.59). Employers score interpretational skills as most important among this group of skills (4.18). The perception gap is the most negative for customer service skills (-.71) followed by ability to plan and organize (-0.39).

For core employability skills, the students' perceptions of importance is highest for hard work (4.55), self-motivation (4.52), and self-discipline (4.51), while the minimum perceived importance is for initiating (3.67). Employers score self-discipline (4.32), being devoted (4.30), and teamwork (4.23) as being most important. The most negative perception gaps are for hard work and being effective (-0.49 each). In this category, there are only two specific skills, being devoted (0.14) and initiating (0.07), for which the perception gap is positive.

The analysis of the perception gap for professional skills depicts that among the skills included in this group, students score honesty (4.59) followed by ability to apply modern tools, equipment, and technologies specific to job (4.50) as most important. While employers score ability to apply knowledge of the subject as most important (4.36). The most negative perception gap is for decision making skills (-0.46). An overview of the perception gaps for the specific skills included in this category reveals the most mixed responses. Four skills were over perceived in importance and other four were under perceived in importance by the graduates compared to employers.

Table 12: Detailed Results for Perception Gap

		Employers' importance	Students' perception	Perception gap
Communication and business specific skills	Verbal communication	3.91	4.25	-0.34
	Communication in mother tongue	3.86	3.59	0.27
	Customer service skills	3.53	4.24	-0.71
	Reading skills	3.99	3.81	0.18
	Interpretational skills	4.18	4.12	0.06
	Entrepreneurship skills	3.97	4.07	-0.10
	Ability to interpret business problems and develop appropriate solutions	3.95	4.21	-0.26
	Ability to plan and organize	3.86	4.25	-0.39
	Average	**3.91**	**4.07**	**-0.16**
Core employability skills	Team work	4.23	4.34	-0.11
	Hard work	4.06	4.55	-0.49
	Self-discipline	4.32	4.51	-0.19
	Effective	3.78	4.27	-0.49
	Devoted	4.30	4.16	0.14
	Productive	3.81	4.06	-0.25
	Self-motivated	4.21	4.52	-0.31
	Initiating	3.74	3.67	0.07
	Average	**4.06**	**4.29**	**-0.23**
Professional skills	Accuracy	4.07	4.03	0.04
	Decision making skills	3.97	4.43	-0.46
	Ability to apply knowledge of the subject	4.36	4.33	0.03
	Ability to use modern tools, equip-ment and technologies specific to job	4.10	4.50	-0.40
	Honest	4.17	4.59	-0.42
	Persistent	3.93	3.67	0.26
	Technical skills related to subject	4.15	4.41	-0.26
	Efficiency	4.32	4.31	0.01
	Average	**4.13**	**4.28**	**-0.15**

Source: Authors' Survey

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. Employability and perception gaps were assessed for each skill category. Students were also differentiated by their discipline of study and results presented on this basis; disaggregated results were also conveyed.

Rather than summarize these various results as already presented, we concentrate here on some brief implications and possibilities for further research. In particular, the following policy implications can be drawn on the basis of the findings regarding the three gaps analyzed to support the objective of the Planning Commission to promote industry-university linkages in Pakistan.

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. Presently, the grading system is a barrier to the promotion of skill based and creative learning. Students have to memorize and reproduce their knowledge instead of demonstrating application of what they have learned. As a result, after graduating they lack market oriented skills and exposure to practical work. 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. Further, universities need to ensure a more active role of the student service centers and quality enhancement cells through frequent surveys about students' satisfaction regarding skill enhancement through university programs.

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.

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.

This study was conducted for the GSG industrial cluster by drawing a limited sample of only 100 employers from industry and 151 students from 6 universities and colleges from the area. The initially proposed sample was larger, but it was reduced due to funding limitations. In this cluster, most of the industries are of small and medium size having low requirements for highly qualified graduates. Therefore, generalization of results should be carefully made because of the cluster specific nature of the study and its limited scope.

There are several possibilities for future research building on the current study. A panel analysis based on the same sample of firms may provide insight about unobservable factors and changes taking place in the industrial cluster regarding employability and performance of fresh graduates. This will help us in understanding the dynamics of the skill gap in rapidly changing job market requirements. To have a comprehensive insight of the issue at the economy level, these studies can also focus on comparative skill gap analysis viz-a-viz other industrial zones in the country. Future research may also take into account the gender dimension of the issue by studying the skill gap at a more disaggregated level. The issue of migration of students to and from the GSG cluster was not addressed in the current study. Allowing for the effect of migration of students might affect the findings of this study to some extent.

From the policy perspective, studies may be conducted to identify the impediments to university-industry-government linkages in the country. Specifically, although there are some university-industry linkages present in the form of internship programs, there is a very limited association between the government and industry in addressing the skill gap present in the university graduates. Therefore, future studies can take a holistic approach in identifying these structural impediments and providing policy reforms to bridge the skill gap. Studies may also be conducted to quantify the extent of a conducive environment for learning and skill enhancement in the universities to lead to suggestions for improvements in the higher education sector. This study focused on measuring the mismatch of skills produced by universities, and required by industry, as perceived by employers and students. In future research, the perspective of policy makers (e.g., HEC) and academia may be incorporated to analyze the issues in a broader perspective.

REFERENCES

Amjad, R. (2005). 'Skills and Competitiveness: Can Pakistan Break Out of the Low-level Skills Trap?' *The Pakistan Development Review*, Vol. 44(4).

Bergad. (2006). 'Skill gap in labor market a gender perspective.' Bergad, Gujranwala.

BFE (2010). 'Employability Skills of the Young People in Bulgaria.' *Business Foundation for Education*, Bulgaria.

Blom, A. and Saeki.H. (2011). 'Employability and Skill Set of Newly Graduated Engineers in India.' *Policy Research Working Paper* 5640, World Bank.

British Council (2009). 'Pakistan: The Next Generation.'

Bunt, K., McAndrew, F. and Kuechel, A. (2005). 'Jobcentre Plus Employer (Market View) Survey 2004.' *DWP Research Report* No 261, London: Department for Work and Pensions.

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.

Cattell RB. (1983). 'The screetest for the number of factors. Multivariate Behav. Res.1:24576, 1966.' *University of illinois*, Urbana-Champaign, IL.

Farooq, S. (2011). 'The Utilization of Education and Skills: Incidence and Determinants among Pakistani Graduates.' *The Pakistan Development Review*, Vol. 50(3).

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.

Gorsuch, R.L. (1983). *Factor Analysis* (Second Edition), Lawrence Erlbaum Associates, Inc. New Jersey, USA.

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*

Hou, X. (2011). 'Challenges for Youth Employment in Pakistan: Are They Youth-Specific?' *World Bank Policy Research Working Paper Series* 5544, World Bank.

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.

ILO(2012). *Global Employment Trends 2012.* International Labor Organization, Geneva.

ILO(2013). *Global Employment Trends 2013. Recovering from a second job dip*. International Labor Organization, Geneva.

Jabeen, T (2011). *An Appraisal of Mismatch between Graduating Students' Perception and Employers' Expectations Regarding Employability Skills*. Thesis: University of Gujrat, Pakistan.

Jaffri, A. A. (2012). 'Youth Agenda.' *The Compact.*

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.

Johnson, R. A. and Wichern, D. W. (2007). *Applied Multivariate Statistical Analysis*. Prentice Hall, USA.

Kemal, A. R. (2005). 'Skill Development in Pakistan.' *The Pakistan Development Review*, Vol. 44(4).

Kim, Jae-on and Muller, C. W. (1978). *Factor Analysis: Statistical Methods and Practical Issues*. Sage Publications, CA, USA.

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).

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

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.

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

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

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.

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

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

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

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*.

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

World Bank, World Development Indicator (2013).

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: STEPS IN FACTOR ANALYSIS

Examination of Correlation Matrix

Examination of the characteristics of correlation matrix is extremely important for factor analysis because the quality of correlation matrix determines if the factorization of the variables is possible or not. To test for the quality of matrices, we apply Bartlett's test of Sphericity and Kaiser-Meyer-Olkin Test (KMO) for sampling adequacy. Both the tests are intended to check the degree of linear association among all the items in the correlation matrix.

a) Bartlett's Test of Sphericity:

Bartlett's proposed a test to check that whether variables are interrelated in the population or not. The null hypothesis to be tested in Bartlett's test of sphericity is that if the correlation matrix is an identity matrix or not. Whereas Identity matrix is referred to as a square matrix with 1's along the diagonal and 0's as the off-diagonal elements. Rejection of this hypothesis means that correlation among all our variables is not identity. Following expression is used to test for the sphericity in the data;

$$\chi^2 = -\left[(N-1) - ((2k+5)/6)\right] \log_e |R| \qquad (1)$$

Where χ^2 is calculated Chi-square for Bartlett's Test, N shows the sample size, k represents the number of variables in the matrix, $\log_e$ is the natural logarithm and |R| is a determinant of correlation matrix.

b) Kaiser-Meyer-Olkin Test (KMO):

KMO compares the magnitude of correlation coefficient to the partial coefficient for the testing of sampling adequacy. The test pattern of KMO is given as under;

$$KMO = \frac{\sum\sum_{i \neq j} r_{ij}^2}{\sum\sum_{i \neq j} r_{ij}^2 + \sum\sum_{i \neq j} a_{ij}^2} \qquad (2)$$

Where ΣΣ measures the summation of all the variables in the correlation matrix when variable $i \neq j$,$rij$is Pearson's correlation between variables i and j and a_{ij} is the partial correlation between variables i and j.

Table A1.1: Kaizer, Meyer, and Olkin had described the size of KMO as subsequent

If KMO Value is….	Outcome
Above .90	Marvelous
In the .80s	Meritorious
In the .70s	Middling
In the .60s	Mediocre
In the .50s	Miserable
Less than .40s	Don't Factor

Extraction Method and Selection of the Number of Factors to Retain

The choice of extraction method is a critical issue because there are seven methods for extraction and each one of these has its own prerequisites for selection. These methods are listed below:

a. Principal Component Analysis (PCA),
b. Principal Axis Factoring (PAF),
c. Maximum Likelihood Methods,
d. Unweighted Least Squares,
e. Generalized Least Squares,
f. Alpha Factoring,
g. Image Factoring.

Our study focused on PCA and PAF methods as extraction method as these are most commonly used and considered as the base for factor analysis (Thompson and Daniel, 1996).

Pett et.al. (2003) describes the basic assumption *of both factoring methods to extract initial factors from the specified matrix are uncorrelated with one another so they are multivariate linear models.*

PCA can be modeled as follows:

$$z_k = a_{k1}PC_1 + a_{k2}PC_2 + \ldots\ldots\ldots + a_{kj}PC_j$$

where

z_k= standardized observed variable for k

a_{kj}= factor loadings (or standardized regression coefficient) of k on PC_j

PC_j= jth common factors

The model of PAF is slightly different from PCA, and it is defined by the following equation:

$$z_k = a_{k1}F_1 + a_{k2}F_2 + \ldots\ldots\ldots + a_{kj}F_j + u_kY_k$$

where

z_k= standardized observed variable for k

a_{kj}= factor loadings (or standardized regression coefficient) of k on F_j

F_j= jth common factors

u_kY_k = factor loading of *k* on its unique factor Y_k

The main difference between PCA and PAF factors is their way to deal with variances. Both PCA and PAF have advantages and disadvantages but researchers have no agreement on which factor is better (Cadman, 2010; Ledesma and Mora, 2007).

PCA gives slightly higher values of estimators as compared to PAF. As we do not know how *significant error of measurement from shared variance play a role in this exercise* therefore PAF has been selected as extraction method in this paper (Blom and saeki, 2011).

After determining on the extraction method, different criteria can be used to retain the number of factors (Zwick and Velicer, 1986).

Eigenvalues

Eigenvalues are used to decide whether a factor should be retained in the analysis or not. According to Kaiser-Guttman rule a factors' eigenvalue should be greater than 1.00 to retain a factor in the analysis (Blom and Saeki, 2011; Cadman, 2010). Kaiser-Guttman rule however is not an optimal strategy to indentify the true structure of the data because it is known to overestimate the number of latent factors (James et al., 2004). Therefore other methods should also be employed to validate the number of extracted latent factors.

Percent of Variance Extracted:

The selection of a factor to be retained in the analysis can also be made by inspecting the cumulative eigenvalues of variables. Cumulative value can be obtained by dividing the eigenvalue of a factor with the sum of eigenvalues. The factors having cumulative value between 75 percent to 80 percent are prescribed to be retained in the analysis.

Scree Plot:

Another decision criterion for retaining the number of factors is the visualization of eigenvalues on a scree plot. The graph is examined to determine the points at which the last significant drop or brake takes place or, where the line levels off (Cattell, 1966). The rationale behind this method is that this point divides the important or major factors from the minor or trivial factors (Ledesma and Mora, 2007).

Rotating Methods

The rotation method is used to interpret the data in a meaningful way to make them more interpretable. Basically two rotation methods namely orthogonal and oblique factor rotations are suggested in the literature (Fabrigar et al., 1999). The Orthogonal method assumes that the retained factors are uncorrelated with each other however oblique methods assumes some association between the retained factors. In the current study, it is unrealistic to assume that the generated factors are completely independent. Therefore, in our analysis we have chosen oblique method for factor rotation.

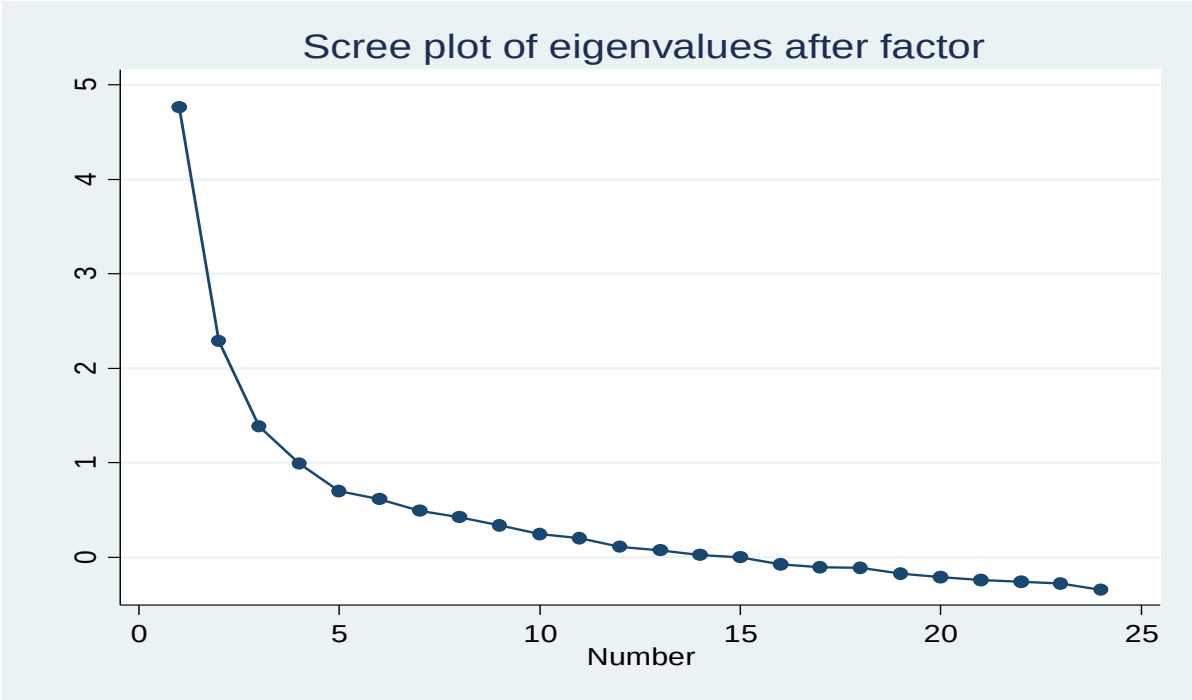
B1.3 Interpreting and Naming the Factors

For interpretation, factor loadings are very important. Factor loadings less than 0.4 can be disregarded for interpretation of the factors. Further, reliability of the instruments has been tested by considering the internal consistency or by viewing the value of Cronbach's alpha for each factor. For a factor to be reliable, its alpha value should be greater than 0.8.

Factor analysis/correlation — Number of obs = 100
Method: principal factors — Retained factors = 3
Rotation: (unrotated) — Number of params = 69

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	4.76314	2.47225	0.4380	0.4380
Factor2	2.29089	0.90881	0.2106	0.6486
Factor3	1.38208	0.38969	0.1271	0.7757
Factor4	0.99239	0.28938	0.0913	0.8670
Factor5	0.70301	0.08595	0.0646	0.9316
Factor6	0.61706	0.12452	0.0567	0.9883
Factor7	0.49254	0.07000	0.0453	1.0336
Factor8	0.42254	0.08266	0.0389	1.0725
Factor9	0.33988	0.09385	0.0313	1.1037
Factor10	0.24603	0.04421	0.0226	1.1264
Factor11	0.20182	0.08829	0.0186	1.1449
Factor12	0.11353	0.03784	0.0104	1.1554
Factor13	0.07569	0.05305	0.0070	1.1623
Factor14	0.02264	0.02252	0.0021	1.1644
Factor15	0.00012	0.07653	0.0000	1.1644
Factor16	-0.07641	0.02560	-0.0070	1.1574
Factor17	-0.10201	0.01054	-0.0094	1.1480
Factor18	-0.11256	0.05846	-0.0103	1.1377
Factor19	-0.17101	0.04018	-0.0157	1.1219
Factor20	-0.21119	0.02807	-0.0194	1.1025
Factor21	-0.23926	0.01650	-0.0220	1.0805
Factor22	-0.25576	0.01964	-0.0235	1.0570
Factor23	-0.27539	0.06899	-0.0253	1.0317
Factor24	-0.34439	.	-0.0317	1.0000

LR test: independent vs. saturated: chi2(276) = 772.23 Prob>chi2 = 0.0000


Scree plot of eigenvalues after factor
0
1
2
3
4
5
0
5
10
15
20
25
Number

APPENDIX C: FACTOR EIGENVALUES

Skills	Communication and business specific skills	Core employ-ability 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

Factor loadings (pattern matrix) and unique variances

Variable	Factor1	Factor2	Factor3	Uniqueness
cq6	0.2658	0.2960	0.3845	0.6939
cq7	0.3447	0.2853	0.1459	0.7784
cq8	0.3417	0.3704	0.3191	0.6442
cq10	0.3535	0.2869	-0.1393	0.7733
cq15	0.3706	0.2280	0.3412	0.6942
cq18	0.3551	0.5171	0.1903	0.5703
cq21	0.4758	0.2315	-0.1541	0.6963
cq24	0.5245	0.2330	0.0666	0.6662
cq26	0.4176	0.2614	0.0151	0.7571
cq28	0.5192	0.3350	0.0707	0.6133
cq30	0.4760	0.2984	-0.1196	0.6701
cq31	0.3314	0.2390	-0.4241	0.6531
d1q1	0.3701	0.0353	-0.3954	0.7055
d1q2	0.4717	-0.1516	-0.2999	0.6646
d1q4	0.3312	0.1988	-0.2547	0.7859
d1q5	0.5566	-0.3136	-0.1197	0.5775
d1q7	0.3829	-0.5725	0.3138	0.4272
d1q8	0.4879	-0.3667	0.1961	0.5891
d1q9	0.5983	-0.3058	0.3384	0.4340
d1q11	0.4964	-0.4039	0.1313	0.5732
d1q12	0.4478	-0.2993	0.0761	0.7041
d1q19	0.5528	-0.1997	-0.1529	0.6312
d1q22	0.3620	-0.3391	-0.2021	0.7131
d1q23	0.6176	-0.1520	-0.2178	0.5480

Test scale = mean(standardized items)

Item	Obs	Sign	item-test correlation	item-rest correlation	average interitem correlation	alpha
cq6	100	+	0.3383	0.2550	0.1850	0.8392
cq7	100	+	0.4128	0.3339	0.1817	0.8363
cq8	100	+	0.4043	0.3249	0.1821	0.8366
cq10	100	+	0.4131	0.3343	0.1817	0.8362
cq15	100	+	0.4184	0.3400	0.1815	0.8360
cq18	100	+	0.4118	0.3329	0.1817	0.8363
cq21	100	+	0.5174	0.4467	0.1771	0.8319
cq24	100	+	0.5381	0.4693	0.1762	0.8311
cq26	100	+	0.4598	0.3843	0.1796	0.8343
cq28	100	+	0.5447	0.4765	0.1759	0.8308
cq30	100	+	0.5107	0.4394	0.1774	0.8322
cq31	100	+	0.3776	0.2965	0.1832	0.8377
d1q1	100	+	0.4090	0.3299	0.1819	0.8364
d1q2	100	+	0.4780	0.4040	0.1788	0.8336
d1q4	100	+	0.3904	0.3101	0.1827	0.8372
d1q5	100	+	0.5566	0.4896	0.1754	0.8303
d1q7	100	+	0.3641	0.2822	0.1838	0.8382
d1q8	100	+	0.4765	0.4024	0.1789	0.8337
d1q9	100	+	0.5874	0.5235	0.1740	0.8290
d1q11	100	+	0.4839	0.4103	0.1786	0.8333
d1q12	100	+	0.4602	0.3847	0.1796	0.8343
d1q19	100	+	0.5527	0.4853	0.1756	0.8305
d1q22	100	+	0.3780	0.2969	0.1832	0.8377
d1q23	100	+	0.6111	0.5498	0.1730	0.8279
Test scale					0.1795	0.8400

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

2033 K Street, NW | Washington, DC 20006-1002 USA | T+1.202.862.5600 | F+1.202.457.4439 | Skype: ifprihomeoffice | ifpri@cgiar.org

This Working Paper has been prepared as an output for the Pakistan Strategy Support Program, funded by USAID, and has not been peer reviewed. Any opinions stated herein are those of the author(s) and do not necessarily reflect the policies or opinions of IFPRI.