An Assessment of Skill Mismatch Between What the Industry Desires and What NBS & S3H Graduates Offer

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Abstract

Over the past few years it has been witnessed that even with an increase in the number of graduates there is lack of job satisfaction as they are finding it difficult to outperform at their workplaces. This paper aims to find the extent of mismatch between the skills demanded by the employers that were divided into eight different sectors and the skills that NUST School of Social Sciences and Humanities (NS3H) and NUST Business School (NBS) inculcate in its graduates. Nineteen skills were grouped into four different sections; knowledge, interpersonal skills, communication skills and work skills. By using descriptive statistics and t- test we found the extent of mismatch for each of the skills. Two hypotheses were tested: NBS & S3H inculcate the relevant skills desired by the market in its undergraduate students and NBS & S3H university graduates provide a better skill set to the market as compared to other universities' undergraduate students. The results showed that the greatest mismatch existed for skills such as judgment, ability to take initiative, ability to link theory to practice, ability to design system component and motivation. This paper also recommends some policies that the institutions and employers can implement for the future.

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Chapter 1: Introduction

In recent years, university graduates have been reported to be inadequately prepared for work. The economic role of human capital, particularly education has long been documented by economists and policy makers (Becker, 1964). According to Higher Education Commission of Pakistan (2012) in 2009 the number of higher education institutions was 127 and these institutions produced 496207 graduates and participation rate was 33.0 % which shows that most of our labor markets are unable to absorb the fresh graduates. These circumstances have implications on the appropriateness of the university education, and consequently the employability and productivity of the university graduates.

Pakistan faces a paradoxical problem of high graduate enrolment and low graduate employment which is also common in some of its neighboring countries like India, Bangladesh, Afghanistan, Nepal, and Sri Lanka. Having a favorable demography is supposed to be a key strength for Pakistan but it might even become a curse if the right policies are not put in place to reap the benefits from the demographic dividend. Pakistan's participation in higher education has increased from 520,666 in 2004 to 1,572,664 2011[1] after an increase in public expenditure in order to have greater access to higher education. Human capital is a vital indicator of the potential of an organization and even a country; it is the human factor which holds the basic capabilities of initiating efficient socioeconomic activities (Asmawati, 2009) and therefore the *quality* of human capital has to be considered carefully. Producing proficient human capital is a challenge for Pakistan because even though educational institutes, which are a primary source of rearing the labor force, are increasing, the *quality* of guidance is questionable.

One of the reasons for the persistent condition of workers in the labor market who find themselves struggling to cope with the demands of their employers is a *skill-mismatch* where there is a disparity between the skills acquired by students in the universities and the actual skills needed in the labor market. Having a narrow focus on only the importance of having a degree is not sufficient to survive in the evolving job market; there is a need for the creation of opportunities where individuals can develop generic attributes besides the specialized knowledge of their degree.

[1] UNESCO Statistics

Skill is the ability to perform a task to a predefined level of competence (Oloyumi & Adedeji, 2012). There are mainly two categories of skills: vocational skills include specialized and technical skills, whereas generic skills include a broader set of attributes which may be utilized across many different occupations. Skills mismatch is generally understood as various types of gaps or imbalances referring to skills, knowledge or competencies that may be of a quantitative or qualitative nature (Proctor & Dutta, 1995). It is the difference between the competence of the graduate and employers' expected competence needs. This phenomenon is becoming increasingly important as employers prefer individuals who have generic competencies such as leadership skills, interpersonal skills, and teamwork capacities (Lee, 2012). Similarly, some of the researches pointed out the importance of generic competencies as a *complement* to the specialization of the employees when taking into account their overall work performance (Malo, 2005). Today's marketplace has become increasingly competitive and even with plenty jobs, employers find it hard to fit graduates into any relevant positions because they lack necessary skills like communication skills. Hence, it has become essential to integrate creativity into our education system in order to prepare the graduates according to the workplace environments that are moving towards capturing the creative competencies as it is one of the few sustainable competitive advantages in the evolving marketplace today (Allen & Velden, 2001).

The low quality of education in Pakistan can be interpreted from the top university rankings; South Asian universities are not ranked in the top 100 of the Times Higher Education (THE) and just three are ranked in the top 400 of the THE rankings which are all Indian Institutes of Technology. The situation is similar across the QS 2012-13 World University Rankings, with South Asia representing just six of the top 500 in the QS rankings where five universities are from India, and only one from Pakistan. This shows that even though the number of private universities in Pakistan increased eight-fold between 1997 and 2004[2], there has not been much focus on *improving* the education system.

Educational institutions are an effective vehicle for the production of skills which are required for the maintenance of growth in the economy, and its impact is of great importance specifically for the policy frameworks of developing countries, which consist of the majority of the world's population, in order to maximize their productivity. However, our graduates are finding it

[2] Higher Education Commission, Pakistan

difficult to outperform at their workplaces which is leading towards low levels of job satisfaction as well as lower productivity.

Employers have become determined in finding graduates who possess the key soft skills and English language abilities. Asian Development Bank (ADB) published a report in 2012 which highlighted the significance of acquiring workers who constitute an innovative nature, who are risk-takers, and adaptable as well as responsive to changing environments; these skills are a requirement for the dynamic economies. Likewise, there may be plenty jobs available for the graduates in a growing economy but employers are challenged to find the *right* workers because graduates lack soft and workforce skills[3]; employers have great expectations about the graduates being more attuned to the external environment which is very competitive and requires effectual problem-solving skills, exemplary communication skills, and creative thinking skills.

Despite the recent socio-economic developments, Pakistan is falling behind in rightly addressing the demands of the labor market by mostly imparting education in conventional subjects. The political instability in the country has harmed the educational system as the curricula remains outdated for long periods of time and thus the human capital accumulation is draining. There is hardly any awareness about the importance of *counselling* the students in an efficient manner which would direct them towards gaining the basic skills that are requires across the many different occupations.

Focusing on the causes and explanations of being *mismatched* to a job, it is important to point out the role of our educational and vocational institutions which are the primary source of empowerment and development for the labor which is supplied to the market. Hence, we formulate our research question:

Does our university (NUST) inculcate the skills in our graduates that are desired in the market?

This research question will be broken down into a few components in order to reach an effective conclusion. There is a need to analyze whether the skills provided by the university to the students are relevant according to their job such that the job market also requires more or less the same set of skills from the graduated students. In addition to this, an evaluation is essential

[3] Statement by Manjula Dissanayake, Founding President, Educate Lanka Foundation

regarding the *gap* that is created when the demands of the employers are not met by the current supply of labor; this could result in rising unemployment or recruitment for mismatched jobs.

Our research will be based on the analysis of NUST's role in incorporating the necessary employability skills and qualities that are deemed essential by the employers in terms of competency. We will also aim towards addressing the consequences that the skills mismatch may create: an inefficient utilization of the tremendous amounts of investments being injected into the university; misallocation of resources towards less sophisticated sectors; waste of talent by being hired in an unsuitable company; and lack of essential skills needed to drive the economic growth of the country.

The significance of our institutions must not be undermined because they are the generators of effective labor which is a fundamental factor of production in an economy. Through this research, we shall attempt to discuss whether the vision followed by our university is favorable for the students as well as for the employers of the country i.e. the market relevance of university guidance.

This paper follows the following structure. Chapter 2 presents the literature review on the existence of skills mismatch and its implications. Chapter 3 demonstrates the methodology utilized to estimate the *extent* of skill mismatch which persists in terms of the skills required by the employers and the skills supplied by our graduates. Chapter 4 provides the results and the subsequent analysis. Lastly, chapter 5 depicts the conclusion and highlights a few relevant policy recommendations.

Chapter 2: Literature Review

This section puts forward the relevant literature found for a greater insight about the existence of skills mismatch throughout the world. Even though our scope of study is narrow and only focuses on a particular school department of a university in Pakistan, there are patterns in literature which help us identify the implications on the educational institutions of Pakistan.

Skills mismatch could play a significant role in leading towards greater levels of unemployment because, as discussed previously, when individuals are unable to outperform in their organizations in terms of the requirements set by their employers as well as when competing with their fellow colleagues from other universities, their chances of being laid-off increase and it even discourages the workers. It can be observed that the number of unemployed people remains high even when there is an abundance of vacancies. This state can be ascribed to the fact that the unemployed pool of individuals is not well-suited to the jobs that are available; their skills do not *match* the requirements of the jobs. The number of qualified graduates in Pakistan is increasing (Government of Pakistan, 1998; Ehrenberg, 2005; Shaw, 2011) because of their perceptions about gaining employability through a degree (Saunders, & Zuzel, 2010). However, there are increasing concerns regarding the difficulties of matching the supply of graduates with the jobs available in the market. Demand for education seems to be low in Pakistan because of the evident declining trend in the returns to education (Qayyum, 2007). It is becoming a common phenomenon to recruit an individual for a job which is not suitable according to his skill-set, yet it is a mere action undertaken to fill up the vacancies in an organization. Even though labor force is growing, unemployment rates have also been on the rise; during 2001-2010, unemployment rate in Pakistan was 5.6% (ESP, 2010-11) which is quite high and suggestive of the fact that employment opportunities have not been consistent with the stride of the labor force.

A mismatch of skills with a job is usually inferred as an imbalance of skills and competencies that are required for a particular occupation, which may be qualitative or quantitative (Proctor & Dutta, 1995). The gap is created due to the employer's expectations about the competency level of the graduates which is not met by the prevalent competency levels of the fresh graduates. Pauw, Oosthuizen, and Westhuizen (2008) studied the paradoxical problem of graduate unemployment in South Africa and highlighted that inadequate career guidance leads to choices for fields of study and types of qualifications which do not provide good employment prospects.

It is essential to prepare the labor supply such that they are more responsive towards the existing and potential characteristics demanded from labor in the industry and hereby focusing on the causes and explanations of being *mismatched* to a job, it is important to point out the role of the educational and vocational institutions which are the primary source of empowerment and development for the labor which is supplied to the market. Education is vital in the development of skills, or likewise human capital, which equips the graduates to become more productive in their occupations as reflected by their earnings (Becker, 1964; Mincer, 1974).

Considering the evolving nature of the job market, scoring high GPA is no more a necessary condition for securing a prosperous job (Chiswic & Miller, 2009) as employers have developed a progressive approach which does not only focus on the academic performance of the individuals but also require generic skills such as problem-solving, analytical and critical thinking, and communication as well as interpersonal skills. Such a demand for skills is on the rise due to the rapid innovations occurring in the modern technologies (Ashton & Green, 1996) which require a higher level of adeptness. It is indeed a fact that the academic skills of an individual are not a sufficient measure of his productive capacity as they only portray the student's test-taking ability and ignore their proficiency towards team-work as well as personal skills (Brown et al. 1997). Human capabilities are not restricted to general skills, there are physical and social skills that portray those independent dimensions of skills which are not strongly acknowledged by the human capital theory (Gardner, 1983). Employers are increasingly inclined towards hiring graduates who are 'business ready' instead of the ones who score high grades but do not possess marketable qualities (Saunders & Zuzel, 2010).

Globally, it is becoming a point of serious concern whether the present conditions of the education systems are relevant for the job industry. Ramlee et al. (2008) delineated the minimal preparedness of the Malaysian graduates to encounter globalization and k-economy era. Consequently, the commitment levels are not up to the mark which hamper their competencies and they are unable to land in a good job. Similarly, nearly 20,000 Sri Lankan graduates faced unemployment because their skills were unable to cover the criteria set by the employers as well as the current job market (Susima & Sununta, 2003). In Australia, the responsibility to inculcate the necessary skills in a graduate falls on the faculty to formulate the curriculum efficiently (Barrie, 2006).

For the developing countries to be competitive, they have to upgrade their level of skills due to the impact of technological change; there is an increased demand for skills as well as different types of skills to tackle the emerging technologies. It is a sign of a successful economy where the skill-set of the labor force is given priority (Sanjay Lall, 1999). Analyzing the differentials in the perceptions of employers and graduates on the importance of employability skills, Lim and Wye (2009) state that it is essential to consider the employers' point of view in formulating the appropriate kind of curriculums for undergraduate study because they are in the best position to provide authentic feedback about the types of skills that are required in the job market. It was also observed that critical thinking and decision-making skills were the most deficient among the graduates. Pitan and Adedeji (2014) examined the case of skills mismatch among university graduates in Nigeria and also stressed that alongside academic skills, analytical and entrepreneurial skills were very significant in the job market because employers associate these skills with greater productivity hence greater profitability.

In a local context, Gayur (1989) evaluated the impact of having unemployed educated youth in Pakistan and concluded that the inefficiencies of the training and the educational systems play a key role in overlooking the existing demands within the labor market. This point is further reinforced by the explanation that the Pakistani youth faces productivity issues and unemployment because they are deprived of efficient guidance by their institutions to acquire the skills that are greatly demanded in the job market; and unlike abroad, there is inadequate counselling towards adopting a field of study which is favorable according to the future prospects in the job industry (Qayyum, 2008). The graduates being produced by our universities lack knowledge, skills, and they are not qualified according to the requirements of the job market (Shujaat et al., 2009). Formal education is necessary for producing competent individuals but it is not sufficient as it must be reinforced and strengthened through effectual training and learning which is fundamental for managing specific technologies, having the capability to identify problems and formulating decisions, and applying knowledge to appropriate circumstances (Sanjay Lall, 1999).

The problems associated with the unemployment and lower productivity of the educated persons in Pakistan initiates through both the demand and supply sides whereby an information base is not strong enough to direct the individuals for effective career counselling (Khan, Ali, & Malik,

1986). The mismatch of skills is prevalent in Pakistan as there is lack of encouragement for entrepreneurship (Aleem, 2004). The changing demands of employers for labor have led to a rise in youth unemployment because the education system has failed to train the young graduates in accordance with the requirements of the job market (Mohring, 2002).

In addition to the struggle for exceling in their respective fields, graduates are observed to have lower levels of job satisfaction when they are unable to cope with overload, role conflict, participation, and especially keeping up with the rapid technological change and being responsible for an innovative role. Evans (1997) defined job satisfaction as a "state of mind determined by the extent to which the individual perceives his/her job related needs being met".

In the banking sector, there is a negative correlation between job stress and job performances and thus individuals suffering from job stress perform much poorly (Bashir & Ramay, 2010). Graduates in Pakistan are not quite aware of the organizational structures of the country and the climate which persists in such corporate arenas hence even if they do constitute the relevant skills, they are not trained enough to apply them in their workspaces; this shows the lack of counselling on career development.

In the financial services, attitude towards the job is another highly significant predictor of job satisfaction and recent graduates often realize that their first or second job is not exactly what they wanted (Devaney & Chen, 2003). Individuals start to realize that their lack of skills is impeding their capabilities for performing well in their fields; because of this, employees tend to get discouraged at work and produce lower quality of work.

The level of individual's job satisfaction is affected by intrinsic and extrinsic motivating factors, the quality of supervision, social relationships within the working group and the degree to which individual success or failure in their work (Daft, 2005). This problem of job satisfaction may be achieved through the combined efforts of the university staff and the student because universities are considered as highest source of knowledge and awareness production institutions, and which train the specialist manpower in different fields of life (Irshad & Khalid, 2011).

From a behavioral dimension, an individual's success at his organization is not only a function of the skills he acquires through higher education but it goes beyond that and constitutes the personal preferences as well as social and emotional needs of the person. It is noteworthy that an

individual's perception of himself infuences his behavior towards his job. For instance, when people judge their own capacities to undertake actions that are required for a particular perfomance, it is known as "self-efficacy" (Bandura, 1986). According to John Holland's "Theory of vocational personalities and work environments" (1997), it was highlighted that when an individual reveals a preference about his occupation, there is an indirect expression of his underlying characteristics, and it can be observed that when employees feel that their characteristics match the job characteristics then they are more inclined towards a good performance and are satisfied with their roles.

Taking into account the six personality types emphasized by John Holland (1997), namely realistic, investigative, artistic, social, enterprising, and conventional, we can assess that the career choices can be associated with these distinct personalities which further determine the perfomance of an individual at his workplace. It would be useful for the graduating students to utilize an assessment instrument which guides them towards knowing their personality type and hence allowing them to choose a job which suits their characteristics.

The role of human capital is vital in understanding the importance of having the right set of skills in order to have greater levels of productivity in jobs. School quality as well as training *within* the organization is an essential component as training has a significant "matching" component in the sense that it is most useful for the worker to invest in a set of specific technologies that the firm will be using in the future, so training is often a joint investment by firms and workers (Acemoglu & Autor, 2011).

The aforementioned literature suggests that there are many implications that an organization may have to face due to the inadequate supply of the required skills. In the long-term, we can associate this problem with the effect it has on the overall economy of a nation. There has been extensive research on the problem of skills mismatch among university graduates worldwide; in the case of Pakistan, there has been a greater emphasis on the educational mismatch and even though some research exists on skills mismatch, the *extent* of skill mismatch has not been considered extensively. The obstacles arising due to a mismatch of skills presents a challenge to the market relevance of the education that the universities provide in the country (Oluyomi S. et al., 2012). The purpose to carry out this study constitutes the need to identify the gaps in the

skills being acquired by the NBS and S3H graduates and to put forth recommendations in order to bridge that gap so that the requirements of the job industry can be met.

Chapter 3: Research Methodology

Keeping in view the research questions and objectives outlined in the introduction, our methodology tests two hypotheses in order to find the mismatch between the skills that NBS & S3H undergraduate students supply and what the employer in each industry classification demands. The hypotheses are:-

1. NBS & S3H inculcate the relevant skills desired by the market in its undergraduate students.
2. NBS & S3H university graduates provide a better skill set to the market as compared to other universities' undergraduate students.

Each hypothesis has been tested individually through descriptive statistics.

Step 1: Choose the specific industries, where majority of the two schools' students are employed. The following industry classifications were chosen to make sure every possible industry is included in our research:-

- Research & Think Tank
- Human Resources
- Finance
- International Organizations
- Marketing
- Media
- Teaching
- Entrepreneurship

Step 2: Identify the soft skills that are, in general, demanded by all these industries.

In order to have a relevant set of soft skills, we took into account HEC's employer survey which determines the supply of skills demanded. To have a more comprehensive survey we added a few skills to the ones they had list that we found necessary. The total list of 19 skills is grouped under 4 general categories, in order to classify the soft skills and be able to provide practically implementable policy recommendations. HEC's survey has been accepted by several academic

institutions including NUST which has uploaded the survey on its website. The list of skills demanded by employers is:

1) Knowledge
    - Math, Science, Humanities and professional discipline
    - Problem formulation and solving skills
    - Collecting and analyzing appropriate data
    - Ability to link theory to practice
    - Ability to design a system component or process
    - Computer knowledge

2) Communication Skills
    - Oral Communication
    - Report Writing
    - Presentation Skills

3) Interpersonal Skills
    - Ability to work in team
    - Leadership
    - Ability to take initiative
    - Independent Thinking
    - Motivation
    - Reliability
    - Adherence to professional values

4) Work Skill
    - Time management skills
    - Judgment
    - Discipline

Step 3: Testing the reliability of our soft skills chosen

We ran the cronbach test in order to rest the reliability of the variables under each category of the list above.
We received 89% reliability for the 'Knowledge' category, displaying strong internal consistency in this group implying that the set of skills chosen are closely related. The cronbach results for the following categories are as follows:

- Communication Skills: 78.5%
- Interpersonal Skills: 84.32%
- Work Skill: 87.27%

Step 4: Construction & Detail of Survey

Since the demand of skills had been determined and confirmed as reliable, we developed an employer survey which would rate the supply of soft skills employers receive relative to their demand. The survey begins by asking for basic information of the organization, followed by providing information of the industry classification they lie in.

We chose employers that were immediate supervisors of our employees, or were at a higher post in the Human Resource Department of the organization. CEO's and senior managers were not asked to fill the survey since they have less contact with the employees and would not be able to judge the skill set of our graduates accurately.

Employers were then asked to answer the questions about each skill (as listed above) of the graduates RELATIVE to the demand of skills required by their organization. For instance, if the demand for "report writing" skills for the organization is being thoroughly fulfilled by the graduates' skills, then they will mark it as option 1 i.e. "excellent." If the demand is not being met by a slight difference, they marked accordingly: 2 i.e very good, 3 i.e good, 4 i.e fair, and 5 i.e poor.

This formed the first part of the survey which provided the data for testing the first hypothesis.

The second part of the survey asked the employers to rate our graduates skills provided on the same scale, however in comparison to the supply received by other universities' graduates. They would mark whether our students ranked excellent, very good, good, fair, or poor in supplying a certain skill compared to other students.

Descriptive statistics were employed in order to find the extent of mismatch of each skill in each industry to get detailed results of which skills are void is what market area.

For each industry, the mean skill demand has been considered to be "5", denoting that employers demand an excellent supply, on average, of each of the 19 skills mentioned. The supply relative to demand was obtained by the data from the survey floated to 80 organizations. 10 responses were recorded for each industry.

Lastly, we used the T TEST for mean comparison in Stata to test our hypotheses for each industry.

Chapter 4: Empirical Testing & Results

Hypothesis 1: NBS & S3H inculcate the relevant skills desired by the market in its undergraduate students

The data received from the first part of the survey was used to test the first hypothesis. Each skill's amount of supply relative to demand was converted from qualitative to quantitative data as follows:

- Excellent: 5
- Very Good: 4
- Good: 3
- Fair: 2
- Poor: 1

The results for the descriptive statistics to identify skills mismatch for each industry are shown below.

1. International Organizations Industry Descriptive Statistics

Skill	Mean Skill Demand	Supply Relative to Demand	Extent of Mismatch	% Mismatch	Rank
Math, Science, Humanities and professional discipline	**5**	**3.5**	**1.5**	**30**	
Problem formulation and solving skills	**5**	**3.44**	**1.56**	**31.11**	
Collecting and analyzing appropriate data	**5**	**3.67**	**1.33**	**26.67**	
Ability to link theory to practice	**5**	**3**	**2**	**40**	**3**
Ability to design a system component or process	**5**	**3.11**	**1.89**	**37.77**	
Computer knowledge	**5**	**3.78**	**1.22**	**24.44**	

Oral communication	**5**	**3.89**	**1.11**	**22.22**	
Report writing	**5**	**3.67**	**1.33**	**26.66**	
Presentation skills	**5**	**3.44**	**1.56**	**31.11**	
Ability to work in teams	**5**	**3.33**	**1.67**	**33.33**	
Leadership	**5**	**3**	**2**	**40**	**3**
Ability to take initiative	**5**	**2.44**	**2.56**	**51.11**	**1**
Independent thinking	**5**	**2.78**	**2.22**	**44.44**	**2**
Motivation	**5**	**3**	**2**	**40**	**3**
Reliability	**5**	**3.22**	**1.78**	**35.55**	
Adherence to Professional Values	**5**	**3.67**	**1.33**	**26.66**	
Time management skills	**5**	**3.44**	**1.56**	**31.11**	
Judgment	**5**	**2.78**	**2.22**	**44.44**	**2**
Discipline	**5**	**3.33**	**1.67**	**33.33**	

The results for international organizations show us that employers are most displeased by NBS & S3H undergraduates in the following areas:

- Ability to take initiative
- Judgment
- Independent Thinking
- Motivation
- Leadership
- Ability to link theory to practice

'Ability to take initiative' displays the highest mismatch of 51.11%. Followed by judgment and independent thinking at 44.44% mismatch. While 'motivation', 'leadership', and 'ability to link theory to practice' stand at 40% mismatch.

T - Test:

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
meande~d	10	5	0	0	5	5
meansu~g	10	3.210526	.2151538	.6803761	2.723815	3.697238
diff	10	1.789474	.2151538	.6803761	1.302762	2.276185

mean(diff) = mean(meandemand - meansupplyrelt~g) t = 8.3172
Ho: mean(diff) = 0 degrees of freedom = 9

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 1.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 0.0000

According to the results presented above for the 10 employers under international organizations, we're able to reject our null hypothesis and conclude that there is a considerable mismatch between the demand and supply of soft skills in the international organization industry.

2. Financial Industry Descriptive Statistics

Skill	Mean Skill Demand	Supply Relative to Demand	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	3.9	1.1	22	
Problem formulation and solving skills	5	3.6	1.4	28	
Collecting and analyzing appropriate data	5	3.8	1.2	24	
Ability to link theory to practice	5	3.1	1.9	38	3
Ability to design a system component or process	5	2.6	2.4	48	1
Computer knowledge	5	3.5	1.5	30	
Oral communication	5	4	1	20	
Report writing	5	3.6	1.4	28	
Presentation skills	5	3.3	1.7	34	
Ability to work in teams	5	3.2	1.8	36	
Leadership	5	3.2	1.8	36	
Ability to take initiative	5	3.1	1.9	38	3
Independent thinking	5	3.3	1.7	34	
Motivation	5	3.1	1.9	38	3
Reliability	5	3.6	1.4	28	
Adherence to Professional Values	5	3.5	1.5	30	
Time management skills	5	3.7	1.3	26	
Judgment	5	3	2	40	2
Discipline	5	3.5	1.5	30	

The results for finance industry show us that employers are most displeased by NBS & S3H undergraduates in the following areas:

- Ability to design a system component or process
- Judgment
- Motivation
- Ability to link theory to practice
- Ability to take initiative

Ability to design a system component or process shows the highest skill mismatch of 48%, followed by judgment at 40%, while ‘motivation, ‘ability to take initiative’, and ‘ability to link theory to practice’ stand at 38% each.

Other skills display a considerable amount of mismatch as well; however, the extent is not as worrisome as the top 5 mentioned above.

T – Test:

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Paired t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
meande~d |      10           5           0           0           5           5
meansu~l |      10         3.4   .1182618   .3739765    3.132473    3.667527
---------+--------------------------------------------------------------------
    diff |      10         1.6   .1182618   .3739765    1.332473    1.867527
------------------------------------------------------------------------------
    mean(diff) = mean(meandemand - meansupplyrelt~l)              t =  13.5293
Ho: mean(diff) = 0                               degrees of freedom =        9

 Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000

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According to the results presented above for the 10 employers financial, we’re able to reject our null hypothesis and conclude that there is a considerable mismatch between the demand and supply of soft skills in the financial industry.

3. Research & Think Tank Industry Descriptive Statistics

Skill	Mean Skill Demand	Supply Relative to Demand	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	3.86	1.14	22.8	
Problem formulation and solving skills	5	3.71	1.29	25.7	
Collecting and analyzing appropriate data	5	3.57	1.43	28.5	
Ability to link theory to practice	5	3.14	1.86	37.1	1
Ability to design a system component or process	5	3.29	1.71	34.2	2
Computer knowledge	5	3.57	1.43	28.5	
Oral communication	5	3.86	1.14	22.8	
Report writing	5	3.29	1.71	34.2	2
Presentation skills	5	4	1	30	
Ability to work in teams	5	4.29	0.71	14.2	
Leadership	5	3.43	1.57	31.4	
Ability to take initiative	5	3.14	1.86	37.1	1
Independent thinking	5	3.29	1.71	34.2	
Motivation	5	3.57	1.43	28.5	
Reliability	5	3.71	1.29	25.7	
Adherence to Professional Values	5	3.71	1.29	25.7	
Time management skills	5	3.57	1.43	28.5	
Judgment	5	3.28	1.72	34.2	2
Discipline	5	3.57	1.43	28.5	

The results for research & think tank industry show us that employers are most displeased by NBS & S3H undergraduates in the following areas:

- Ability to take initiative
- Judgment

- Report writing skills
- Ability to link theory to practice
- Ability to design a system component or process

Ability to take initiative displays the highest mismatch at 37.1%, followed by judgment, report writing, and ability to link theory to practice at 34.2%.

T – Test

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
meande~h	7	5	0	0	5	5
supply~h	7	3.571429	.260748	.6898744	2.933401	4.209456
diff	7	1.428571	.260748	.6898744	.790544	2.066599

mean(diff) = mean(meandemandrese~h - supplyreltodem~h) t = 5.4787
Ho: mean(diff) = 0 degrees of freedom = 6

Ha: mean(diff) < 0 Pr(T < t) = 0.9992
Ha: mean(diff) != 0 Pr(|T| > |t|) = 0.0015
Ha: mean(diff) > 0 Pr(T > t) = 0.0008

According to the results presented above for the 7 employers research and think tanks we're able to reject our null hypothesis and conclude that there is a considerable mismatch between the demand and supply of soft skills in the research and think tank industry.

4. Human Resource Industry Descriptive Statistics

Skill	Mean Skill Demand	Supply Relative to Demand	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	3.89	1.11	22.22	
Problem formulation and solving skills	5	3.89	1.11	22.22	
Collecting and analyzing appropriate data	5	3.33	1.67	33.33	3
Ability to link theory to practice	5	3.78	1.22	24.44	
Ability to design a system component or process	5	3	2	40	1
Computer knowledge	5	3.67	1.33	26.66	
Oral communication	5	4.11	0.89	17.7	
Report writing	5	3.56	1.44	28.9	
Presentation skills	5	3.78	1.22	24.4	
Ability to work in teams	5	3.78	1.22	24.4	
Leadership	5	3.56	1.44	28.9	
Ability to take initiative	5	3	2	40	1
Independent thinking	5	3.56	1.44	28.9	
Motivation	5	3.22	1.78	35.6	2
Reliability	5	3.67	1.33	26.7	
Adherence to Professional Values	5	3.78	1.22	24.4	
Time management skills	5	3.56	1.44	28.9	
Judgment	5	3.33	1.67	33.33	3
Discipline	5	4	1	20	

The results for Human Resource industry show us that employers are most displeased by NBS & S3H undergraduates in the following areas:

- Ability to take initiative
- Ability to design a system design or component

- Motivation
- Judgment
- Collecting and analyzing appropriate data

Ability to take initiative and ability to design a system component or process rank the highest at 40% mismatch, followed by motivation at 35.6%, while judgment and collecting and analyzing appropriate data stand at 33.33%.

Till now, in the four industries mentioned, 'ability to take initiative' & 'judgment' have been common in all, showing a general lack of these soft skills in our students up till now.

T – Test

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
supply~R	9	3.602339	.2569608	.7708824	3.009786	4.194892
meande~R	9	5	0	0	5	5
diff	9	-1.397661	.2569608	.7708824	-1.990214	-.8051081

mean(diff) = mean(supplyreltodem~R - meandemandHR) t = -5.4392
Ho: mean(diff) = 0 degrees of freedom = 8

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.0003 Pr(|T| > |t|) = 0.0006 Pr(T > t) = 0.9997

According to the results presented above for the 9 employers under Human Resource, we're able to reject our null hypothesis and conclude that there is a considerable mismatch between the demand and supply of soft skills in the Human Resource Industry industry.

5. Marketing Industry Descriptive Statistics

Skill	Mean Skill Demand	Supply Relative to Demand	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	3.2	1.8	36	
Problem formulation and solving skills	5	3.2	1.8	36	
Collecting and analyzing appropriate data	5	3.1	1.9	38	
Ability to link theory to practice	5	2.8	2.2	44	3
Ability to design a system component or process	5	2.6	2.4	48	2
Computer knowledge	5	3.2	1.8	36	
Oral communication	5	4	1	20	
Report writing	5	3.3	1.7	34	
Presentation skills	5	3.1	1.9	38	
Ability to work in teams	5	3.4	1.6	32	
Leadership	5	2.8	2.2	44	3
Ability to take initiative	5	2.5	2.5	50	1
Independent thinking	5	3.4	1.6	32	
Motivation	5	3.3	1.7	34	
Reliability	5	3.7	1.3	26	
Adherence to Professional Values	5	3.4	1.6	32	
Time management skills	5	3.1	1.9	38	
Judgment	5	2.9	2.1	42	4
Discipline	5	3.3	1.7	34	

The results for marketing industry show us that employers are most displeased by NBS & S3H undergraduates in the following areas:

- Ability to take initiative
- Ability to design a system design or component

- Leadership
- Ability to link theory to practice
- Judgment

Ability to take initiative ranks the highest at 50% mismatch, ability to design a system design or component at 48% mismatch, followed by ability to link theory to practice and leadership at 44% mismatch, and judgment at 42% mismatch.

T – Test

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
meande~d	10	5	0	0	5	5
supply~g	10	3.173684	.2644471	.8362552	2.575463	3.771905
diff	10	1.826316	.2644471	.8362552	1.228095	2.424537

mean(diff) = mean(meandemand - supplyreltodem~g) t = 6.9062
Ho: mean(diff) = 0 degrees of freedom = 9

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 1.0000 Pr(|T| > |t|) = 0.0001 Pr(T > t) = 0.0000

According to the results presented above for the 10 employers under Marketing, we're able to reject our null hypothesis and conclude that there is a considerable mismatch between the demand and supply of soft skills in the Marketing industry.

6. Media Industry Descriptive Statistics

Skill	Mean Skill Demand	Supply Relative to Demand	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	3.5	1.5	30	
Problem formulation and solving skills	5	3.3	1.7	34	
Collecting and analyzing appropriate data	5	3.5	1.5	30	
Ability to link theory to practice	5	2.9	2.1	42	2
Ability to design a system component or process	5	3	2	40	
Computer knowledge	5	3.5	1.5	30	
Oral communication	5	3.5	1.5	30	
Report writing	5	2.9	2.1	42	2
Presentation skills	5	3.5	1.5	30	
Ability to work in teams	5	3.3	1.7	34	
Leadership	5	3.1	1.9	42	2
Ability to take initiative	5	2.9	2.1	42	2
Independent thinking	5	3	2	40	
Motivation	5	2.8	2.2	44	1
Reliability	5	3.3	1.7	34	
Adherence to Professional Values	5	3.4	1.6	32	
Time management skills	5	3.2	1.8	36	
Judgment	5	2.8	2.2	44	1
Discipline	5	3.7	1.3	26	

The results for media industry show us that employers are most displeased by NBS & S3H undergraduates in the following areas:

- Time management skills
- Motivation

- Ability to link theory to practice
- Report writing
- Leadership
- Ability to take initiative

Motivation and judgment rank the highest at 44% mismatch, followed by ability to link theory to practice, report writing, leadership, and ability to take initiative all at 42% mismatch each.

T – Test

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
meansu~a	10	3.215789	.1650336	.5218819	2.842458	3.589121
meande~d	10	5	0	0	5	5
diff	10	-1.784211	.1650336	.5218819	-2.157542	-1.410879

mean(diff) = mean(meansupplyrelt~a - meandemand) t = -10.8112
Ho: mean(diff) = 0 degrees of freedom = 9

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 1.0000

According to the results presented above for the 10 employers under Media, we're able to reject our null hypothesis and conclude that there is a considerable mismatch between the demand and supply of soft skills in the Media industry.

7. Teaching Industry Descriptive Statistics

Skill	Mean Skill Demand	Supply Relative to Demand	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	4	1	20	
Problem formulation and solving skills	5	3.88	1.12	22.5	
Collecting and analyzing appropriate data	5	3.75	1.25	25	
Ability to link theory to practice	5	3.63	1.37	27.5	
Ability to design a system component or process	5	2.88	2.12	42.5	1
Computer knowledge	5	3.5	1.5	30	
Oral communication	5	4.13	0.87	17.5	
Report writing	5	3.38	1.62	32.5	3
Presentation skills	5	3.63	1.37	27.5	
Ability to work in teams	5	4	1	20	
Leadership	5	3.5	1.5	30	
Ability to take initiative	5	3.38	1.62	32.5	3
Independent thinking	5	4	1	20	
Motivation	5	3.25	1.75	35	
Reliability	5	3.75	1.25	25	
Adherence to Professional Values	5	3.63	1.37	27.5	
Time management skills	5	3.38	1.62	32.5	3
Judgment	5	3.13	1.87	37.5	2
Discipline	5	3.88	1.12	22.5	

The results for teaching industry show us that employers are most displeased by NBS & S3H undergraduates in the following areas:

- Ability to design a system component or process
- Judgment
- Time management skills

- Ability to take initiative
- Report writing

Ability to design a system component or process ranks the highest at 42.5% mismatch, followed by judgment at 37.5%, while time management skills, ability to take initiative, and report writing are at 32.5%.

T – Test

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
meande~d	8	5	0	0	5	5
meansu~g	8	3.611842	.2655786	.7511698	2.983848	4.239836
diff	8	1.388158	.2655786	.7511698	.7601642	2.016152

```
     mean(diff) = mean(meandemand - meansupplyrelt~g)              t =   5.2269
 Ho: mean(diff) = 0                                     degrees of freedom =        7

 Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
 Pr(T < t) = 0.9994         Pr(|T| > |t|) = 0.0012          Pr(T > t) = 0.0006
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According to the results presented above for the 8 employers under international organizations, we're able to reject our null hypothesis and conclude that there is a considerable mismatch between the demand and supply of soft skills in the teaching industry.

8. Entrepreneurship Industry Descriptive Statistics

Skill	Mean Skill Demand	Supply Relative to Demand	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	3.88	1.12	22.5	
Problem formulation and solving skills	5	3.63	1.37	27.5	
Collecting and analyzing appropriate data	5	3.5	1.5	30	1
Ability to link theory to practice	5	3.5	1.5	30	1
Ability to design a system component or process	5	3.75	1.25	25	
Computer knowledge	5	3.75	1.25	25	
Oral communication	5	4.38	0.63	12.5	
Report writing	5	3.5	1.5	30	1
Presentation skills	5	4	1	20	
Ability to work in teams	5	4	1	20	
Leadership	5	4	1	20	
Ability to take initiative	5	3.63	1.38	27.5	
Independent thinking	5	3.88	1.13	22.5	
Motivation	5	4	1	20	
Reliability	5	3.88	1.13	22.5	
Adherence to Professional Values	5	3.75	1.25	25	
Time management skills	5	4	1	20	
Judgment	5	3.63	1.38	27.5	
Discipline	5	4.13	0.88	17.5	

The results for entrepreneurship industry show us that employers are most displeased by NBS & S3H undergraduates in the following areas:

- Collecting and analyzing proper data
- Ability to link theory to practice
- Report writing

All three of them rank the highest at 30% mismatch.

Under our first hypothesis, we observe that the students of NBS and S3H have performed the best in terms of their soft skills supply in the entrepreneurship industry. The percentage of mismatch for most skills fell below 30%, hence displaying lesser severity.

T – Test

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
meande~d	8	5	0	0	5	5
meansu~d	8	3.828947	.244397	.6912592	3.25104	4.406855
diff	8	1.171053	.244397	.6912592	.5931454	1.74896

mean(diff) = mean(meandemand - meansupplyrelt~d) t = 4.7916
Ho: mean(diff) = 0 degrees of freedom = 7

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.9990 Pr(|T| > |t|) = 0.0020 Pr(T > t) = 0.0010

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According to the results presented above for the 8 employers under entrepreneurship, we're able to reject our null hypothesis and conclude that there is a considerable mismatch between the demand and supply of soft skills in the entrepreneurship industry.

"Given that the hypothesis is rejected for each industry in the market, we can conclude that the hypothesis is rejected in the market i.e. NBS & S3H do not inculcate the relevant skills desired by the market in its undergraduate students"

Hypothesis 2: NBS & S3H university graduates provide a better skill set to the market as compared to other universities' undergraduate students

We could not make derive reliable conclusions based solely on the first hypothesis' results presented above, as it shows the performance of our students independent of what other university's graduates are supplying. If all the students in the market are at a similar standing to

ones from NBS & S3H, then employers would have not substantial reasoning to reject our students for employment opportunities, or stunt their career growth.

In order to find the supply of soft skills by NBS and S3H graduates relative to the supply by other universities' graduates, we tested the second hypothesis written above. Hence, we essentially found the relative performance of our students to other graduates.

1. International Organizations Industry Descriptive Statistics

Skill	Mean Skill Supply	Supply Relative to Other Graduates	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	3.5	1.5	30	
Problem formulation and solving skills	5	3.6	1.4	28	
Collecting and analyzing appropriate data	5	3.4	1.6	32	
Ability to link theory to practice	5	3.5	1.5	30	
Ability to design a system component or process	5	3.5	1.5	30	
Computer knowledge	5	4.1	0.9	18	
Oral communication	5	4.11	0.89	17.77	
Report writing	5	3.6	1.4	28	
Presentation skills	5	3.7	1.3	26	
Ability to work in teams	5	3.6	1.4	28	
Leadership	5	3.5	1.5	30	
Ability to take initiative	5	3.3	1.7	34	4
Independent thinking	5	3	2	40	2
Motivation	5	2.9	2.1	42	1
Reliability	5	3.5	1.5	30	
Adherence to Professional Values	5	3.8	1.2	24	
Time management skills	5	4	1	20	
Judgment	5	3.11	1.89	37.77	3
Discipline	5	3.7	1.3	26	

The results for the international organization industry show that NBS & S3H undergraduate students supply the following soft skills considerably less than other universities' graduates:-

- Motivation
- Independent Thinking
- Judgment
- Ability to take initiative

Motivation displayed by our students is 42% less than the mean supply of motivation by other graduates. Independent thinking 40% less, judgment 37.77%, and ability to take initiative 34%.

T – Test

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Paired t test
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Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
meansu~y	10	5	0	0	5	5
supply~g	10	3.552632	.2062803	.6523155	3.085993	4.01927
diff	10	1.447368	.2062803	.6523155	.98073	1.914007

```
    mean(diff) = mean(meansupply - supplyreltooth~g)              t =   7.0165
Ho: mean(diff) = 0                                     degrees of freedom =        9

 Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0001          Pr(T > t) = 0.0000
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According to the results above, we are able to reject the null hypothesis and conclude that NBS & S3H University graduates do not provide a better skill set to the international organization industry as compared to other universities' undergraduate students.

2. Financial Industry Descriptive Statistics

Skill	Mean Skill Supply	Supply Relative to Other Graduates	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	4.22	0.78	15.5	
Problem formulation and solving skills	5	4.22	0.78	15.5	
Collecting and analyzing appropriate data	5	4	1	20	
Ability to link theory to practice	5	3.22	1.78	35.5	3
Ability to design a system component or process	5	2.89	2.11	42.22	1
Computer knowledge	5	3.78	1.22	24.44	
Oral communication	5	4.33	0.67	13.33	
Report writing	5	4	1	20	
Presentation skills	5	4	1	20	
Ability to work in teams	5	3.89	1.11	22.22	
Leadership	5	3.78	1.22	24.44	
Ability to take initiative	5	3.44	1.56	31.11	
Independent thinking	5	3.67	1.33	26.66	
Motivation	5	3.78	1.22	24.44	
Reliability	5	3.67	1.33	26.66	
Adherence to Professional Values	5	3.11	1.89	37.77	2
Time management skills	5	3.33	1.67	33.33	4
Judgment	5	2.89	2.11	42.22	1
Discipline	5	3.89	1.11	22.22	

The results for the financial industry show that NBS & S3H undergraduate students supply the following soft skills considerably less than other universities' graduates:-

- Ability to design a system component or process
- Adherence to professional values

- Judgment
- Ability to link theory to practice
- Time management skills

Our students supply judgment and ability to design a system component or process skills 42.22% less than other university's graduates. Adherence to professional values lacks by 37.77% than the mean skill supply, ability to link theory to practice by 35.55%, and time management skills by 33.33%.

T – Test

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
meansu~y	10	5	0	0	5	5
supply~l	10	3.4	.1182618	.3739765	3.132473	3.667527
diff	10	1.6	.1182618	.3739765	1.332473	1.867527

mean(diff) = mean(meansupply - supplyreltooth~l) t = 13.5293
Ho: mean(diff) = 0 degrees of freedom = 9

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 1.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 0.0000

According to the results above, we are able to reject the null hypothesis and conclude that NBS & S3H University graduates do not provide a better skill set to the financial industry as compared to other universities' undergraduate students.

3. Research & Think Tank Industry Descriptive Statistics

Skill	Mean Skill Supply	Supply Relative to Other Graduates	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	3.71	1.29	25.71	
Problem formulation and solving skills	5	3.29	1.71	34.28	
Collecting and analyzing appropriate data	5	3.29	1.71	34.28	
Ability to link theory to practice	5	3.14	1.86	37.14	3
Ability to design a system component or process	5	3.14	1.86	37.14	3
Computer knowledge	5	3.57	1.43	28.57	
Oral communication	5	3.71	1.29	25.71	
Report writing	5	2.71	2.29	45.71	1
Presentation skills	5	3.57	1.43	28.57	
Ability to work in teams	5	3.86	1.14	22.85	
Leadership	5	3.29	1.71	34.28	
Ability to take initiative	5	2.86	2.14	42.85	2
Independent thinking	5	3.29	1.71	34.28	
Motivation	5	3.29	1.71	34.28	
Reliability	5	3.29	1.71	34.28	
Adherence to Professional Values	5	3.43	1.57	31.42	
Time management skills	5	3.14	1.86	37.14	3
Judgment	5	3.43	1.57	31.42	
Discipline	5	3.57	1.43	28.57	

The results for the research & think tank industry show that NBS & S3H undergraduate students supply the following soft skills considerably less than other universities' graduates:-

- Report writing
- Ability to take initiative

- Ability to link theory to practice
- Ability to design a system component or process
- Time management skills

Report writing skills are 45.71% less than the mean supply of this soft skill by other universities' graduates. Followed by ability to take initiative which is 42.85% less, and ability to link theory to practice, ability to design a system component or process, and time management skills each lack by 37.14%.

T – Test

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
supply~h	7	3.345865	.3262384	.8631457	2.547588	4.144141
meansu~h	7	5	0	0	5	5
diff	7	-1.654135	.3262384	.8631457	-2.452412	-.8558587

mean(diff) = mean(supplyreltooth~h - meansupplyrese~h) t = -5.0703
Ho: mean(diff) = 0 degrees of freedom = 6

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.0011 Pr(|T| > |t|) = 0.0023 Pr(T > t) = 0.9989

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According to the results above, we are able to reject the null hypothesis and conclude that NBS & S3H University graduates do not provide a better skill set to the research & think tank industry as compared to other universities' undergraduate students.

4. Human Resource Industry Descriptive Statistics

Skill	Mean Skill Supply	Supply Relative to Other Graduates	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	4.22	0.78	15.55	
Problem formulation and solving skills	5	3.89	1.11	22.22	
Collecting and analyzing appropriate data	5	3.78	1.22	24.44	
Ability to link theory to practice	5	3.67	1.33	26.66	
Ability to design a system component or process	5	3.56	1.44	28.88	
Computer knowledge	5	3.78	1.22	24.44	
Oral communication	5	3.78	1.22	24.44	
Report writing	5	3.56	1.44	28.88	
Presentation skills	5	4.11	0.88	17.77	
Ability to work in teams	5	4.22	0.78	15.55	
Leadership	5	3.56	1.44	28.88	
Ability to take initiative	5	3.78	1.22	24.44	
Independent thinking	5	3.88	1.11	22.44	
Motivation	5	3.22	1.78	35.55	1
Reliability	5	3.78	1.22	24.44	
Adherence to Professional Values	5	3.89	1.11	22.22	
Time management skills	5	3.44	1.56	31.11	3
Judgment	5	3.33	1.67	33.33	2
Discipline	5	4	1	20	

The results for the human resource industry show that NBS & S3H undergraduate students supply the following soft skills considerably less than other universities' graduates:-

- Motivation
- Judgment
- Time management skills

Motivation displayed by our graduates is 35.55% less than the mean motivation by other graduates. Followed by judgment at 33.33% less, and time management skills 31.11%.

T – Test

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
meansu~R	9	5	0	0	5	5
supply~R	9	3.760234	.2787916	.8363749	3.117339	4.403129
diff	9	1.239766	.2787916	.8363749	.5968715	1.882661

mean(diff) = mean(meansupplyHR - supplyreltooth~R) t = 4.4469
Ho: mean(diff) = 0 degrees of freedom = 8

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.9989 Pr(|T| > |t|) = 0.0021 Pr(T > t) = 0.0011

According to the results above, we are able to reject the null hypothesis and conclude that NBS & S3H University graduates do not provide a better skill set to the Human Resource industry as compared to other universities' undergraduate students.

5. Marketing Industry Descriptive Statistics

Skill	Mean Skill Supply	Supply Relative to Other Graduates	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	3.2	1.8	36	
Problem formulation and solving skills	5	3.2	1.8	36	
Collecting and analyzing appropriate data	5	3.2	1.8	36	
Ability to link theory to practice	5	2.9	2.1	42	3
Ability to design a system component or process	5	3	2	40	4
Computer knowledge	5	3.1	1.9	38	
Oral communication	5	3.6	1.4	28	
Report writing	5	3.1	1.9	38	
Presentation skills	5	3.2	1.8	36	
Ability to work in teams	5	3.1	1.9	38	
Leadership	5	2.7	2.3	46	1
Ability to take initiative	5	2.9	2.1	42	3
Independent thinking	5	3.7	1.3	26	
Motivation	5	3.3	1.7	34	
Reliability	5	3.7	1.3	26	
Adherence to Professional Values	5	3.1	1.9	38	
Time management skills	5	3.6	1.4	28	
Judgment	5	2.8	2.2	44	2
Discipline	5	3.2	1.8	36	

The results for the marketing industry show that NBS & S3H undergraduate students supply the following soft skills considerably less than other universities' graduates:-

- Leadership
- Judgment

- Ability to take initiative
- Ability to link theory to practice
- Ability to link design a system component or process

Leadership skills rank the highest as they are inculcated 46% less in our graduates compared to others. Followed by judgment at 44%, ability to take initiative and link theory to practice stand at 42% less, and ability to design a system component or process is 40%.

T – Test

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
meansu~y	10	5	0	0	5	5
suppl~ng	10	3.189474	.257387	.8139292	2.607224	3.771724
diff	10	1.810526	.257387	.8139292	1.228276	2.392776

```
    mean(diff) = mean(meansupply - supplyreltoot~ng)              t =   7.0343
Ho: mean(diff) = 0                                     degrees of freedom =        9

 Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0001          Pr(T > t) = 0.0000
```

.

According to the results above, we are able to reject the null hypothesis and conclude that NBS & S3H University graduates do not provide a better skill set to the marketing industry as compared to other universities' undergraduate students.

6. Media Industry Descriptive Statistics

Skill	Mean Skill Supply	Supply Relative to Other Graduates	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	3.3	1.7	34	
Problem formulation and solving skills	5	3	2	40	3
Collecting and analyzing appropriate data	5	3	2	40	3
Ability to link theory to practice	5	2.8	2.2	44	1
Ability to design a system component or process	5	2.9	2.1	42	2
Computer knowledge	5	3.6	1.4	28	
Oral communication	5	2.9	2.1	42	2
Report writing	5	3	2	40	3
Presentation skills	5	3	2	40	3
Ability to work in teams	5	3.4	1.6	32	
Leadership	5	3.1	1.9	38	
Ability to take initiative	5	3	2	40	3
Independent thinking	5	3.1	1.9	38	
Motivation	5	3.4	1.6	32	
Reliability	5	3.3	1.7	34	
Adherence to Professional Values	5	3.7	1.3	26	
Time management skills	5	3.4	1.6	32	
Judgment	5	3.2	1.8	36	
Discipline	5	4.1	0.9	18	

The results for the media industry show that NBS & S3H undergraduate students supply the following soft skills considerably less than other universities' graduates:-

- Ability to link theory to practice
- Ability to design a system component or process

- Oral communication
- Report writing
- Presentation skills
- Ability to take initiative
- Collecting and analyzing appropriate data
- Problem formulation and solving skills

We observe that the media industry is doing considerably worse than the other industry evaluated above, as there are several skills that show a high percentage of mismatch. Ability to link theory to practice is displayed 44% by NBS and S3H graduates, and the other skills listed all have a percentage mismatch above 40% as well.

T – Test

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
meansu~y	10	5	0	0	5	5
supply~a	10	3.172222	.1777102	.5619691	2.770214	3.574231
diff	10	1.827778	.1777102	.5619691	1.425769	2.229786

```
    mean(diff) = mean(meansupply - supplyreltooth~a)              t =  10.2852
Ho: mean(diff) = 0                                     degrees of freedom =        9

Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

.

According to the results above, we are able to reject the null hypothesis and conclude that NBS & S3H University graduates do not provide a better skill set to the media industry as compared to other universities' undergraduate students.

7. Teaching Industry Descriptive Statistics

Skill	Mean Skill Supply	Supply Relative to Other Graduates	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	3.75	1.25	25	
Problem formulation and solving skills	5	3.75	1.25	25	
Collecting and analyzing appropriate data	5	3.25	1.75	35	2
Ability to link theory to practice	5	3.75	1.25	25	
Ability to design a system component or process	5	2.88	2.12	42.5	1
Computer knowledge	5	3.5	1.5	30	
Oral communication	5	3.75	1.25	25	
Report writing	5	3.38	1.62	32.5	3
Presentation skills	5	3.88	1.12	22.5	
Ability to work in teams	5	3.75	1.25	25	
Leadership	5	3.75	1.25	25	
Ability to take initiative	5	3.75	1.25	25	
Independent thinking	5	3.75	1.25	25	
Motivation	5	3.75	1.25	25	
Reliability	5	3.75	1.25	25	
Adherence to Professional Values	5	3.75	1.25	25	
Time management skills	5	3.25	1.75	35	2
Judgment	5	3.75	1.25	25	
Discipline	5	3.88	1.12	22.5	

The results for the teaching industry show that NBS & S3H undergraduate students supply the following soft skills considerably less than other universities' graduates:-

- Ability to design a system component or process

- Collecting and analyzing appropriate data
- Time management skills
- Report writing

Ability to design a system component or process is displayed the least by our graduates compared to other graduates as it is 42.5% less in comparison. Followed by time management skills, and collecting and analyzing appropriate data 35% than the supply of these skills by other graduates, while report writing skills are 32.5% less.

T – Test

```
Paired t test
------------------------------------------------------------------------------
Variable |       Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
meansu~g |         8           5           0           0           5           5
sup~hing |         8    3.631579   .2336883   .6609702    3.078994    4.184164
---------+--------------------------------------------------------------------
    diff |         8    1.368421   .2336883   .6609702    .8158361    1.921006
------------------------------------------------------------------------------
     mean(diff) = mean(meansupplyteac~g - supplyrelto~hing)        t =   5.8558
 Ho: mean(diff) = 0                                     degrees of freedom =        7

 Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
 Pr(T < t) = 0.9997         Pr(|T| > |t|) = 0.0006          Pr(T > t) = 0.0003
```

According to the results above, we are able to reject the null hypothesis and conclude that NBS & S3H University graduates do not provide a better skill set to the teaching industry as compared to other universities' undergraduate students.

8. Entrepreneurship Industry Descriptive Statistics

Skill	Mean Skill Supply	Supply Relative to Other Graduates	Extent of Mismatch	% mismatch	Rank
Math, Science, Humanities and professional discipline	5	3.62	1.37	27.5	
Problem formulation and solving skills	5	4	1	20	
Collecting and analyzing appropriate data	5	3.75	1.25	25	
Ability to link theory to practice	5	3.75	1.25	25	
Ability to design a system component or process	5	3.62	1.37	27.5	
Computer knowledge	5	3.5	1.5	30	2
Oral communication	5	3.87	1.13	22.5	
Report writing	5	3.25	1.75	35	
Presentation skills	5	3.87	1.12	22.5	
Ability to work in teams	5	3.5	1.5	30	2
Leadership	5	3.62	1.38	27.5	
Ability to take initiative	5	3.37	1.62	32.5	1
Independent thinking	5	3.65	1.37	27.5	
Motivation	5	3.62	1.37	27.5	
Reliability	5	3.5	1.5	30	2
Adherence to Professional Values	5	3.5	1.5	30	2
Time management skills	5	3.62	1.37	27.5	
Judgment	5	3.5	1.5	30	2
Discipline	5	3.7	1.25	25	

The results for the entrepreneurship industry show that NBS & S3H undergraduate students supply the following soft skills considerably less than other universities' graduates:-

- Ability to take initiative
- Reliability

- Adherence to professional values
- Judgment
- Ability to work in teams
- Computer knowledge

Ability to take initiative is supplied 32.5% less by our graduates compared to other graduates, while the rest of the soft skills listed above are 30% less in supply.

T – Test

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
meansu~r	8	5	0	0	5	5
supply~r	8	3.625	.3146026	.8898306	2.881083	4.368917
diff	8	1.375	.3146026	.8898306	.6310829	2.118917

mean(diff) = mean(meansupplyentr~r - supplyreltooth~r) t = 4.3706
Ho: mean(diff) = 0 degrees of freedom = 7

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.9984 Pr(|T| > |t|) = 0.0033 Pr(T > t) = 0.0016

According to the results above, we are able to reject the null hypothesis and conclude that NBS & S3H University graduates do not provide a better skill set to the entrepreneurship industry as compared to other universities' undergraduate students.

"Given that our hypothesis is rejected in every industry, we can conclude that in the overall market, NBS & S3H University graduates do not provide a better skill set as compared to other universities' undergraduate students"

According to the matching theory, failure in labour market is reflective of the mismatch between employers and graduates which can occur due to a couple of reasons such as imperfect information resulting in increased costs for search and time. Success in the labour market is defined as graduates securing employment opportunities that utilize their skills efficiently.

As this study has shown that the graduates lack in skills such as taking an initiative, motivation, and leadership among others that are of great importance to employers hence resulting to mismatch. Porter and McKibbin (1988) concluded that employers desired higher level of behavioral skills to complement the cognitive skill set they possess. They highlighted the lack of importance given to ethical behavior, communication and people management skills.

The most important job of institutions is to reduce the mismatch between skill set of graduates and that demanded by employers to ensure students are well aware of their options and opportunities. According to the results, NBS and S3H students are also weak in being able to design a system component which suggests that proper mentoring and training is not available to them that may improve on these abilities. There seems to be an ignorance towards the provision of value-added services which are actually efficient and follow-up on the performances of the individuals.

Due to increasing competition, it is evident that if students lack any specific skills or are not fulfilling the requirements of the employers as competitively as the graduates from other universities, the candidates will suffer from lower levels of job satisfaction. As the results delineate, compared to other universitys' graduates, NBS and S3H graduates lack mostly in the *ability to take initiative*, *ability to design a system component or process*, and the *ability to link theory to practice.* Considering the significance of these skills for a strong work ethic, it is essential to note that we are lacking in competency development and our curricula content and assessment is not instilling the students with the appropriate skills.

The lack of motivation and judgement skills displayed by our students demonstrates that the teachers are not redesigning their lectures and curricula in order to enhance practical learning. There is not much training in this aspect as the available resources are not dedicated towards proper planning and development of effectual programs. Even though we do utilize a performance assessment survey in order to gather feedback on the efficiency of the teachers, the non-serious attitude of the students themselves creates a barrier.

In order to enhance the intellectual capabilities of fresh graduates and make them ever ready to get employed into relevant industries, there have been efforts put into Work Integrated Learning (WIL) through processes like industry placements and sandwich courses (Healey 2008). Other than these industries should form links with universities to play a role in the curricula development procedures. A study conducted by Crebert et al. (2004) found that this sort of industry involvement was of great benefit to graduates and employers.

WIL programs include initiatives such as work placements, internships and sandwich courses. These can help improve the quality of graduates by providing students with real life work experiences, facing and learning how to deal with problems more efficiently and mainly helping with time management issues. These practices can turn work places into centers where students can learn directly through working and gaining experience first-hand rather than just studying about it from the books. This can help them develop skills like better communication and leadership. The students can get great tools on their hand in this extremely competitive environment to help them get employed.

Chapter 5: Conclusion & Policy Recommendations

In conclusion, the research question which raised the concern whether our university (NUST) inculcates the skills in our graduates that are desired in the market has been addressed to an extent through the descriptive statistics that we carried out and tested their significance using the t-test. Both our hypotheses were rejected that suggests NBS & S3H graduates are not entirely inculcated with the skills desired by the market and that NBS & S3H graduates are not absolutely competitive in terms of skills when compared to graduates from other universities. The skills where our students lack the most constitute judgement, ability to take initiative, ability to link theory to practice, ability to design a system component or process, and motivation. We can justify these results on the basis that given the resources of our institutions, it is unlikely that the skill-set of all the students can be improved in a similar manner; the existence of diversity in terms of the background of every student, every activity is not bound to have the same effect on each individual. However, the results do imply the underlying weaknesses of the services provided at the university and the inefficiency of planning and developing content which empowers the students with the adequate skills demanded in the labor market.

Evaluating the aforementioned discussion leads us to a few policy recommendations that may assist the relevant institutions for the provision of a purposeful climate for the graduating students. Even though the issue of skill-mismatch in our country is greater than it seems, and the narrow nature of our study does not dig deep into the country-wide implications, there are particular actions that could be a first step towards tackling this problem in the long-run.

Firstly, the ever-increasing competition in every industry has created a barrier of entry for the individuals who are not well-prepared to cope with such atmosphere. Universities must therefore aim to encourage a self-organizing behavior as well as career development skills which focus on the improvement of skills like teamwork, communication and especially the ability to apply their learned content.

Moreover, in order to increase the capability of our students such that they may find it easier to relate their studies to the practical circumstances that they face at workplaces, universities may focus at easing the transition process for their students by reviving the same courses that they teach through teaching methods which enhance the practical applications of the content.

Furthermore, there is disconnect between the skills required by the employers and the awareness that exists in our graduating students. Practically, it may not be feasible to gather complete information but through integration with particular employers from different departments, the educational institutions can cooperate with the persisting conditions in the labor market. This could also be achieved through efforts at a smaller scale, such as creating career-counselling committees and other associations which involve the participation of our alumni; this may prove helpful in providing the fresh graduates with orientations about workplace environment and ethics.

Summing up, the relevant institutions have a key role to play in the process of providing the appropriate environment for the students. It is vital to understand the requirements of operating in a competency based environment and the subsequent need to upgrade to higher value-added activities that encourage the students to inculcate the relevant skills that are demanded in the labor market as well as to ensure our university's continuing ability to compete in the evolving labor market.

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Appendix

List of employers surveyed for the research:

MySolNet

HBL

Focus Technologies

Front Office

Arcana Info

Bahria Town

Teradata

Bahria Town

FBR

Rally energy Pakistan ltd.

Schlumberger

Shell

State Bank of Pakistan

Fauji Fertilizer Bin Qasim Ltd

Australian High Commission

Beaconhouse School System

AMAL Human Development Network

Coca Cola Beverages Pakistan Limited

LMKT

British Council

UNDP

BOL

Hazum Enterprises

Dr. Babar Awan Law Company

BNAM Autoworld

NZ Bridal

GSK

P&G

Netherlands High Commission

Allied Bank

Bank Alfalah

PTV

Benchmark School System

Roots

Horizon Foundation

Mobilink

Business

Shan Marketing Services

Telenor

Ferguson

Alif bae pae

Mobilink

Little Athens

Coke

Bank Alfalah

Shell

Vermillion Events

Shahtaj

Qadbury

Touchstone International

Peak Freans

Cotec

Axact

Westminster school and college Islamabad

Caravaan Group

Buitems University

Sustainable development policy institute

Pakistan Engineering Council

Zong

A.F Ferguson & Co.

Rozan

University of Management Sciences and IT

Daraz

SDPI

ADCOM